guage. SOA properties are then verified according to two steps: the first is performed by the pi-Diapason virtual machine that allows the extraction of all possible execution traces, while the second is done by the analyser, which allows properties expressed using logic-Diapason to be checked over all the previously extracted traces. In addition to this formal verification, the animator lets us simulate one or more of the SOA’s execution traces in a graphical manner. This is a more intuitive (though informal) way of checking the SOA’s structure and behaviour.

Diapason Engineering Environment
A Diapason service orchestration is deployed as a service; this embeds the service-orchestration pi-Diapason description, a pi-Diapason virtual machine, in order to interpret the orchestration and a context-aware deployment platform (according to the application server on which the service is deployed, ie Tomcat Axis or similar).

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SUPER – Raising Business Process Management Back to the Business Level
by Matthias Born, Christian Drumm, Ivan Markovic and Ingo Weber

The SUPER project (Semantics Utilized for Process Management within and between Enterprises) is working on improving the modelling and management of business processes. This will be achieved by integrating semantic technology with business process management (BPM), and would provide answers to two of the most prominent issues emerging in this area: shifting control of processes from IT professionals to business experts, and scaling up BPM to support processes of higher complexity.

SUPER is an EU-funded Integrated Project that has a duration of three years and is under the coordination of SAP. It started in April 2006 and unites nineteen partners and approximately sixty researchers. The project consortium is a balanced blend of industrial partners, use case partners and academic research teams from all over Europe.

The motivation behind SUPER arises from the challenges of the increased frequency with which business models and the contexts of enterprises change in today’s world. This rate of change is generally caused by new internal or external business requirements (eg closer integration with suppliers and customers, implementation of new industry-specific standards or deployment of new application components), which may originate from emerging business opportunities or new regulations from legal bodies. In this environment, two requirements are paramount: to provide fast and easy access to the process space of an organization and to enable swift adaptation of operational business processes.

The major objective of SUPER is to raise business process management from the IT level to the business level. This objective requires that BPM be accessible to business experts and business analysts without requiring detailed technical expertise. Semantic Web and particularly Semantic Web services promise to enable users to perform complex tasks without requiring an understanding of the underlying technology. Therefore, this project aims at providing a framework that is context-aware and based on Semantic Web Service technology, and which acquires, organizes, shares and uses the knowledge embedded in business processes and IT systems. This knowledge is presented to business experts and analysts in an understandable format through a novel process-modelling tool. Using this tool the framework enables them to easily analyse, change and create business processes, leading to a higher degree of agility in companies.

SUPER achieves this objective by adding semantic annotations to BPM artefacts (like process activities, services and execution artefacts), thereby making these artefacts accessible for advanced querying and reasoning. Using these querying and reasoning approaches, the tools developed in SUPER support users during business process modelling through techniques such as Semantic Business Process Discovery, Semantic Business Process Composition and Semantic Business Process Mediation.

Business Process Discovery provides support to the business expert during the modelling phase by simplifying the reuse of existing artefacts. For this task we provide a rich formal framework for the description of business process models, covering all workflow perspectives (data, control, resource). This enables
Life-Cycle Support of Semantic Web Services

by László Kovács, András Micsik and Tomáš Pariente

In the frame of the INFRWEBS project, a software toolset for creating, maintaining and executing WSMO (Web Service Modelling Ontology) services was developed. The implemented framework supports open and extensible development platforms for Semantic Web services.

The INFRAWEBS project has developed a framework that enables software and service providers to generate and establish open and extensible development platforms for Web service applications. The project was funded by the EU with participation of 12 European partners: FH Bochum, University of Innsbruck, IIT-BAS, SZTAKI, NTUA, Profüm SA, Sirma SAI, FUTUREtec, Atos Origin, Best-HP, Aspasia Knowledge Systems and big7.net.

The project divides the life cycle of Semantic Web services (SWS) into two different phases: design time and run time. The role of the design-time tools is to ready existing Web services for semantic deployment. During the design-time phase, various tools and editors support the creation of semantic descriptions for existing Web services.

For example, the SWS Designer (SWS-D) is a visual editor of SWS descriptions, which helps to create service descriptions for Web services by applying drag-and-drop graphical editing and case-based reasoning. The Designer contains a visual axiom editor, which makes the compilation of logical queries easier even for non-expert users.

The SWS Composer (SWS-C) is another visual tool for creating a Semantic Web service through the composition of existing WSMO-based services. It also uses a case-based memory for retrieving service composition templates quasi-similar to the service to be composed.

The resulting ontologies, goals and Semantic Web services are made accessible in a distributed registry (DSWS-R). WSMO (Web Service Modelling Language) was chosen as the language for describing these semantic entities. The run-time phase involves discovery, selection and execution of the Semantic Web services. The Quality of Service (QoS) Broker component of the run-time environment collects QoS data for Semantic Web services, which are fed back into the phase of discovery and selection.

Developers of SWS-based applications use the SAM module (Service Access Middleware) as a central API to INFRAWEBS services. With the help of SAM they are able to create Java code to discover, select and execute Semantic Web services. SAM is also able to hide the WSDL syntax from developers, so no WSML parser is necessary in the applications.

The discovery engine of INFRAWEBS was implemented by SZTAKI as part of the SAM module. According to the usual scenario, the discovery engine receives a WSMO goal as input and must provide a list of matching Semantic Web services, possibly coupled with additional information that supports ranking and selection.

Discovery implementation has three steps: pre-filtering, logical matching and finalizing to prepare the result. The aim of the pre-filtering step is to narrow the list of candidates using traditional text-processing (keyword matching) algorithms. This pre-filtering is supported by a structured text indexing and clustering service, which is another module of the framework. Pre-filtering is optimized reducing the process modelling time by avoiding reinventing the wheel.

The chosen testbed for the achievements of the project is the telecommunications sector, where the limitations of traditional BPM approaches like cost and delay of process set-up are clearly visible, and currently limit the development of advanced, more agile business models.

Link: http://ip-super.org/

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