Added value of semantics in the SPIKE platform

Semantic annotations of services are used during the whole life cycle of the business alliance. Unique feature of the SPIKE semantic approach is that it is well aligned with the existing SOA technologies and it allows gradual implementation of the semantic enhancements.

Contracting phase

SPIKE platform supports semantic discovery of services, which allows searching for services according to their functional properties (i.e. what service provides or what is required as inputs), according to terms/categories, which can be arbitrary assigned to the services and according to various additional metadata about the service or about the service provider.

During the contracting phase, semantic discovery can be used in two ways:

- In order to find a new business partner providing the required services
- In the case that partners are known, the semantic discovery can be used in order to generate matching between the partners’ business processes.

Integration phase

As it was described for the contracting phase, when a new alliance of partners is established, it is necessary to align and integrate business processes of each business partner, who is a member of the alliance in order to support effective collaboration.

Semantic annotations of the services provide explicit semantic description of interfaces which a company provides or requires to/from business partners. Using the SPIKE semantic discovery of services, it is possible to match automatically entry points in business processes of the alliance partners, what simplifies integration of the processes.

Additionally, very important semantic functionality for the integration phase is the semantic data mediation where ontologies serve as a common data model used in order to solve mismatches in the structure of the data passed between the service provider and requester.

Execution phase

During the execution phase of the business alliance, when partners are cooperating, semantic annotations of services are used for automatic compensation of service failures, i.e. in the case of an execution error, the service can be automatically substituted with another service, which provides requested outputs matched using the SPIKE semantic discovery without any additional configuration of the execution environment.

http://www.ibime.upv.es/bie/docs/EMBC06-Semantic.pdf

Ontologies are used to give meaning to information structures that are exchanged by information systems [1]

Ontologies have become a key technology due to its advantages [2].

ontologies are reusable, that is, the same ontology can be reused in different applications, either individually or in combination with other ontologies

ontologies are shareable, that is, their knowledge allows for being shared by a particular community

ontologies facilitate the human understanding of the information besides the access based on information and the integration of information of very different information systems

Publishers might use different field names for the same concept of constraints on future possibilities for both the applications and the data. This flexibility does offer the possibility that working with these triples doesn't need to know about field names in advance. The flexibility that this offers lets developers that store them are called triplestores. Unlike relational database field value combination (more technically known as a subject/predicate/object) is called a triple, and the database managers must be URLs to avoid confusion. If you can do this, you can store any metadata about anything. The (resource, field name, field value) combination (more technically known as a subject/predicate/object) is called a triple, and the database managers that store them are called triplestores. Unlike relational database managers and production XML systems, the technology for working with these triples doesn't need to know about field names in advance. The flexibility that this offers lets developers fit applications around their data instead of shoehorning their data into the current application's requirements, which can put a lot of constraints on future possibilities for both the applications and the data. This flexibility does offer the possibility that two publishers may use different field names for the same concept.

The kind of technology developed to support semantic web projects offers an alternative. The RDF triples at the base of the natural choice for working with information in databases, spreadsheets, documents, the Web, and more. These silos take many forms, including hard copy faxes or images, application databases, spreadsheets, wiki pages or Word documents. Currently, collaboration consists of sharing documents and spreadsheets via email, shared files on a common file/web server or within a document management system. It is often impractical to find--let alone reuse--the data contained in these documents without significant effort and risk of error. Data created by applications and business systems is also difficult to reuse outside of the application that created it. Most difficult of all is combining data from a number of these different sources in an ad hoc manner that can quickly meet an immediate business requirement.

Semantically-enabled data brings computing to an entirely new level:

- **Data Access** - Semantic open data standards act as a least common denominator representation for data of all formats, making a semantic platform the natural choice for working with information in databases, spreadsheets, documents, the Web, and more.
- **Flexibility** - Semantic data is freed from the confines of the software that creates it. Spreadsheet data can show up in a database, on the web, or in other new spreadsheets. Database records created in one application can now be manipulated through spreadsheets or other applications.
- **Extensibility** - Business requirements typically change more quickly than application software. Semantically-enabled software is built for change. Logic changes, data-schema changes, and presentation changes can all be made on the fly in a matter of hours by non-programming resources.
- **Security** - Traditional security models offer limited protection because they secure systems rather than data. With the Anzo suite of semantic applications, security is possible at the data-element level. Wherever the newly smart data goes, it carries its full security model along with it.

Today's BPM software still requires a lot of human intervention throughout the BPM lifecycle. In particular, there are substantial difficulties and efforts incurred when it comes to bridging the gap between the business view and the IT view on business processes, for example, when a high-level business process model designed by a business user has to be translated to an executable process model by IT experts. These difficulties, often referred to as the Business–IT gap, are caused partly by the lack of understanding of the business needs by IT experts on the one hand and of technical details unknown to the business experts on the other hand. This results in significant delays between completion of the business view of the business process and the time it is ready for execution (long time to market).

The vision of Semantic Business Process Management (SBPM) is to close the Business–IT gap by using semantic technologies [1]. Like Semantic Web Services (SWS) that achieve a higher degree of automation in discovery and mediation compared to conventional Web Services, SBPM attempts to improve the level of automation in process modeling, configuration, execution, monitoring, and analysis by using ontologies and Semantic Web Services technologies.

Robert Shimp, vice president of Oracle's global technology business unit:

The two main business problems that mainstream types of companies deal with are having lots of sources of customer names and addresses and trying to reconcile them out of their CRM and support systems and order processing systems -- who is the customer and ensuring I have one customer record. That's a very typical example. There are multiple databases of sources that were never designed to work together but you must be able to pull data out of them and rationalize the information. Traditionally that's been done using ETL technologies and data hubs and data warehousing technologies.

The other common business problem is parts — lots of parts and suppliers, with different numbers even if they're very similar. Trying to keep track of what's what and what you can order from someone is very complicated. Semantic technology lets you say this part from supplier one is equivalent to this part from the other supplier.

There are even bigger possibilities for semantic technology. Think about business intelligence ... What if BI tools could tap into existing data and provide you intelligence in real time. There are huge opportunities there to increase the value of your IT. ()