



D13.1v0.3 Web Service Execution Environment - Conceptual Model (WSMX_O)

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1. Introduction

This document identifies and describes the concepts within a Web Service Modeling Execution Environment (WSMX). By doing this, the aim is to provide not only a common vocabulary, meant to be used at different phases of this project, but also a central point of reference for the design and development team.

To identify the WSMX concepts, a detailed description of the real-world problem we intend to solve will be provided and analyzed. The concepts are identified based strictly on this description.

This document is structured in four parts. [Section 1](#) is an introduction to the topic. [Section 2](#) describes the real world problems. [Sections 3](#) have the role of identifying the concepts. The last part, [Section 4](#) contains the final conclusions.

2. Real-World Problem

For identifying the concepts involved in WSMX we start with a simple problem: considering that we have a certain *goal*, we need to identify a *Web Service* able to fulfil it. Each of them uses different *ontologies* and each of the ontologies consists of *concepts* and the *relations* between the concepts. Additionally, an ontology may use one or more *mediators*.

Every Web Service is described in terms of its functionality by its *capability*. A Web Service may also use mediators.

The goal that needs to be fulfilled may contain not only the description of the tasks the corresponding Web Service should provide, but also a list of *preferences* (for example, when the goal is to buy a certain book, a preference could be to buy it at the lowest price, from the most reliable Web Service).

There are two necessary steps for satisfying a goal: the discovery of all Web Services that may satisfy the goal and the selection of only one Web Service for the actual provision of the service. The first one deals with goal-capability matching, and the second one complying with the preferences. A possible problem that may occur during these two phases is the usage of different ontologies (the Web Services may use different ontologies from the requestor business partner). In this case, the requestor and the Web Services need to use mediators (the [Web Service Modeling Ontology](#) ooMediator), which in the first phase will provide the mapping between the goal and the capability, and in the second phase between the non

functional properties of the Web Service and the preferences expressed by the requestor.

3. Concepts

Analyzing the real-world problem description from the previous section, one can identify the following concepts: *goal*, *ontology*, *concept* (*conceptDefinition*), *relation* (*relationDefinition*), *mediator* (we are referring here only to the *ooMediator*), *web Service*, *capability*, and *preference*.

Most of these concepts are described in Web Service Modeling Ontology ([WSMO](#)), and we will keep these definition unaltered; the only exception is the concept *preferences*, a preference representing a constraint on one or more of the Web Service's non functional properties. A business partner may have more than one preference, for allowing the selection of the most suited Web Service – if there is more than one service that satisfies the goal, only one is chosen based on these preferences.

A *preference* is an instance of the [WSMO](#) *axiomDefinition*:

```
preference:axiomDefinition
```

Listing 1. Preference definition

Although the preferences play an important role in the selection of the Web Service, since the selection problem is not yet addressed in the actual development of WSMX architecture and implementation, this concept will not be considered for the time being. As a consequence, the WSMX Conceptual Model represents a subset of [WSMO](#).

4. Conclusions

This document covered an important phase in the development of a software tool: the identification of the involved concepts and of the conceptual model. The purpose of developing this conceptual model is to provide a common vocabulary and a central point of reference for the design and development team.

References

[Roman et al., 2004] D. Roman, H. Lausen, U. Keller (eds.): Web Service Modeling

Ontology (WSMO), version 1.0 available at <http://www.wsmo.org/2004/d2/v1.0/>

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