Semantic Web Processes:
Semantics Enabled Annotation, Discovery, Composition and Orchestration of Web Scale Processes

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Abstract

This tutorial deals with the evolution of inter-Enterprise and Web scale process to support e-commerce and e-services. It taps into the promises of two of the hottest R&D and technology areas: Web services and the Semantic Web. It presents how applying semantics to each of the steps in the Semantic Web Process lifecycle can help address critical issues in reuse, integration and scalability.

1. Introduction

The Web coupled with E-commerce and E-services is enabling a new networked economy [1]. The scope of activities that processes span has moved from intra-enterprise workflows, predefined inter-enterprise and B2B processes, to dynamically defined Web processes among cooperating organizations. Components of a solution involve the technologies for information exchange (from EDI to XML), software componentization (from CORBA to Web Services), and workflow coordination and collaboration. Semantics is the new component to this mix [2], which could enable support for both the scalability and dynamic nature of these Web processes.

2. Semantic Annotation of Web Services

Today, Web service specifications are based on standards that only define syntactic characteristics. Unfortunately, it is insufficient, since the interoperation of Web services/processes cannot be successfully achieved. One of the most recognized solutions to solve interoperability problems is to enable applications to understand methods and data by adding meaning to them.

3. Semantic Web Service Discovery

The search of Web services to model e-commerce applications differs from the search of tasks to model traditional process. One of the main differences is in terms of the number of Web services available to the composition process. Potentially thousands of Web services are available. One of the problems that need to be solved is how to efficiently discover Web services [4].

4. Semantic Process Composition and Orchestration

Compared to traditional process tasks, Web services are highly autonomous and heterogeneous. Sophisticated methods are indispensable to support the composition and orchestration of Web process. Here again, one possible solution is to explore the use of semantics to enhance interoperability among Web services.

5. Semantic Web Process QoS

New trading models, such as e-commerce, require the specification of QoS metrics such as products or services to be delivered, deadlines, quality of products, and cost of service. To enable adequate QoS management, research is required to develop mechanisms that semantically specify, compute, monitor, and control the QoS of the products or services to be delivered [3][4].

6. References

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Tutorial presentation/resource at: http://swp.semanticweb.org