

Semantic Web and Beyond: Computing for Human Experience

Semantic Web Services Challenge

Results from the First Year

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A Declarative Approach using SAWSDL and Semantic Templates Towards Process Mediation

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Summary. In this paper we address the challenges that arise due to heterogeneities across independently created and autonomously managed Web service requesters and Web service providers. Previous work in this area either involved significant human effort or in cases of the efforts seeking to provide largely automated approaches, overlooked the problem of data heterogeneities, resulting in partial solutions that would not support executable workflow for real-world problems. In this paper, we present a planning-based approach to solve both the process heterogeneity and data heterogeneity problems. We adopt a declarative approach to capture the partner specifications external to the process and demonstrate the usefulness of this approach in adding more dynamism to Web processes. Our system successfully outputs a BPEL file which correctly solves a non-trivial real-world problem in the SWS Challenge.

Semantic Templates, Process Mediation, Semantic Web Services, SAWSDL, SWS Challenge

6.1 Introduction

Web services are software systems designed to support interoperable machine-to-machine interactions over a network. They are the preferred standards-based way to realize Service Oriented Architecture (SOA) computing. A problem that has seen much interest from the research community is that of automated composition (i.e., without human involvement) of Web services. The ultimate goal is to realize Web service compositions or Web processes by leveraging the functionality of autonomously created services. While SOAs loosely coupling approach is appealing, it inevitably brings the challenge of heterogeneities across these independently developed services. Two key types of heterogeneities are those related to data and process. It is necessary and critical to overcome both types of these heterogeneities in order to organize autonomously created Web services into a process to aggregate their power.

Previous efforts related to Web service composition considered various approaches, and have included use of HTN [1], Golog [2], classic AI planning [3], rule-based planning [4]