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Abstract

**THE SEMANTIC WEB SERVICES FRAMEWORK  
FOR AUTOMATING SOA-BASED SYSTEMS**

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In recent years, most enterprises have made extensive investments in Service Oriented Architecture (SOA). SOA provides a cost-effective solution to evolve and enhance enterprise information systems. An increasing number of companies are looking at Web services and SOA as a method for addressing the integration requirements involved in building connected applications. However, realizing the fuller scope of the promise of Web services and associated SOA will require further technological advances in the areas of service discovery, invocation, composition and interoperation. Semantics, especially as supported by the use of ontology, and related Semantic Web technologies, are likely to provide better qualitative and scalable solutions to these requirements. This thesis presents the analysis, design and implementation of a Semantic Web Services Framework or SWSF, which utilizes Semantic Web service languages and tools to make the Web services discovery, invocation, composition and interoperation automatically. The SOA system can make use of this framework to facilitate rapid cross-business integration in heterogeneous environments using Web services. In order to show the functionality of this framework, a prototyped semantic travel services system has been developed for helping the customers who want to book the air-flight tickets, reserve hotel rooms and purchase the event tickets.

**Keywords:** Service Oriented Architecture, ontology, Semantic Web services, services discovery