

# A Practical Approach to the Measurement of Similarity between WSDL-based Web Services

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**Abstract.** Similarity measurement between web services is a key solution to benefit from the reuse of the large number of web services freely available in the internet. This paper presents a practical approach that enables an effective measurement of web service similarity based on their interfaces described with WSDL. The approach relies on the use of multiple matching techniques and different semantic and structural similarity metrics. The measurement of similarity determines the best substitute for a failed web service. So, it serves as a good indicator of the substitutability relation and thus of the capacity for reuse. A support tool, implementing the approach, is also presented with some experimental results conducted on real-world web services.

## 1 Introduction: Context and Motivation

Service-Oriented Architecture (SOA) is an architectural style for designing distributed applications using functionality implemented by third-party providers. In an SOA, the service requester satisfies its specific needs by using services offered by service providers. One concrete technology used for implementing SOA is Web Services.

According to the W3C, a Web Service is defined as "*a software system designed to support interoperable machine-to-machine interaction over a network*" (Chinnici et al., 2007). Its interface can be described as a WSDL (Web service Description Language) document that contains structured information about the Web service's location, its offered operations and the input/output parameters.

Interface descriptions (WSDL documents) enable Web services to be discovered, used by applications or other Web services, and composed into new more complex Web services.

Studying the similarity between Web service descriptions is a key solution for building compositions and healing them by finding relevant substitutes for the failed web services. The real motivation of measuring the similarity of such specific kind of software artifacts emanates from the fact that recently thousands of Web services are indexed in libraries, like ServiceXplorer<sup>1</sup> or XMethods<sup>2</sup>. The existence of such large space of Web services led us to the study

1. ServiceXplorer Website: <http://eil.cs.txstate.edu/ServiceXplorer/>

2. XMethods Website: <http://www.xmethods.net>