Development and Application of Web Services

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Web services are increasingly becoming an integral part of the IT landscape. Many organizations are, for example, building service-oriented architectures based on Web services, most packaged application vendors have incorporated Web services interfaces in their products, and Web services are becoming an important mechanism for business-to-business transactions. But still, a majority of organizations are only beginning to leverage Web services and many open questions remain, particularly for the development for large scale mission critical applications for which security and reliability are a key concern. As with most new phenomenon, several streams of research have sought to identify ways that Web services can be used. Early literature in this area has sought to understand the uses of Web services, its current limitations, and potential solutions to resolve those limitations. For example, while core standards for the interface description and message transport have matured and are being widely implemented, standards relating to other layers of the Web services “technology stack” (e.g., orchestration, security, and reliability) are still emerging. In the 3 papers presented here, the discussion ranges broadly across this domain.

The first paper SERVIAM Maintenance Framework proposes a framework for evolving and maintaining Web service systems. Kajko-Mattsson and Tepczynski suggest that advantages from technological innovations are often gained at the expense of undermining the well-established software engineering methodologies. We should expect similar obstacles when adapting to Service Oriented Architecture (SOA), based on the Web service (WS) technologies. The authors then describe their maintenance framework and its application by several organizations in Poland and Sweden.

The second paper Semantic Web Service Discovery in the OWL-S IDE addresses the issue of creating efficient Web services registries. Srinivasan et al. suggest that the increasing availability of web services necessitates an efficient discovery and execution framework, and that the use of XML at various levels of web services standards poses challenges. The authors present an integrated development environment based on OWL-S, which assists developers in the development of semantic web services. The semantics provided by OWL support greater automation of service selection, invocation, translation of message content between heterogeneous services, and service composition. The authors conclude that the algorithms provided in this paper may provide a valuable basis for an efficient and scalable implementation of the proposed semantic search in UDDI.

The final paper Horizontal and Vertical Factors Influencing the Adoption of Web Services analyzes the challenges organizations in varying industries are facing in the process of adopting Web services. While Web services at their core are a horizontal or cross-industry technology, the findings of this exploratory study suggest that there are important vertical or industry specific factors that can either promote or inhibit the adoption of Web services in a particular industry. Ciganek et al. conclude that the pace and approach of adoption can be expected to vary between industries and that it is important for IT decision makers to be aware of and carefully assess these factors to make appropriate adoption decisions.

In summary, the topics examined in these 3 papers reflect the wide range of interests and possibilities within the relatively new domain of Web services research. Collectively these papers take an interesting look across a variety of topics in the Web services area and provide impulses relevant for practitioners and future academic research.