

Abstract

Web Services connect computers and devices with each other using the Internet to exchange data and combine data in new ways. Web Services can be defined as software objects that can be assembled over the Internet using standard protocols to perform functions or execute business processes. The key to Web Services is on-the-fly software creation through the use of loosely coupled, reusable software components. This has fundamental implications in both technical and business terms. Software can be delivered and paid for as fluid streams of services as opposed to packaged products. It is possible to achieve **automatic, ad hoc interoperability** between systems to accomplish business tasks. Business services can be completely decentralized and distributed over the Internet and accessed by a wide variety of communications devices. Businesses can be released from the burden of complex, slow and expensive software integration and focus instead on the value of their offerings and mission critical tasks. Then the Internet will become a global common platform where organizations and individuals communicate among each other to carry out various commercial activities and to provide **value-added services**. There are important steps to take to bring web services and fully enabled E-commerce to reality. Anybody must be able to trade and negotiate with everybody else. However, such an open and flexible E-commerce has to deal with many obstacles before it becomes reality:

- Current web service technology around UDDI, WSDL, and SOAP is not yet mature enough. Elements need to be added around document structures, semantics of data, business logics, message exchange sequences, and formalization. Combining Ontology technology with workflow approaches is required to enrich web service technology enabling their use in mission-critical applications. A comprehensive **Web Service Modeling Framework (WSMF)** has to be developed.
- Mechanized support is needed in **discovering services** and their offers are required. Currently, nearly all of this work is done manually which seriously hampers the scalability of electronic commerce. A Web Service discovery framework that goes beyond simple key-word-based registration means providing full-fledged Semantic Web-driven service discovery has to be defined based on approaches such as XML, XML Schema, RDF(S), DAML+OIL, and OWL.
- Means for **scalable mediation between different and heterogeneous services** fundamentally based on the P2P approach in order to provide direct connectivity between service requestors and service providers have to be developed. The mediation framework will substantially rely on the **semantics-driven descriptions of data and business logics**. This framework will also include means for configuration, composition and negotiation of Web Services.

Bringing Web Service for E-commerce to its full potential requires a **Peer-to-Peer (P2P)** approach combined with **Semantic Web** technology. The three bottlenecks in E-commerce introduced above must be tackled. Therefore, a methodological framework needs to be developed and tools that enable fully flexible E-commerce also for Small and Medium sized Enterprises (SMEs) relying on open, state-of-the-art standards and technologies.