Context

We are on the brink of a new generation of World Wide Web (WWW): the *Semantic Web*. Unlike the existing WWW, where data is primarily intended for human consumption, the Semantic Web will provide data that is also machine processable. This will enable a wide range of intelligent services such as information brokers, search agents, information filters etc., a process that Tim Berners-Lee describes as "bringing the Web to its full potential".

The development of ontologies will be central to this effort. Ontologies are metadata, providing a controlled vocabulary of terms, each with an explicitly defined and machine processable semantics. By defining shared and common domain theories, ontologies help both people and machines to communicate more effectively. They will therefore have a crucial role in enabling content-based access, interoperability and communication across the Web, providing it with a qualitatively new level of service: the Semantic Web.

The Semantic Web will also be crucial to the development of Web applications such as e-commerce, providing users with much more sophisticated searching and browsing capabilities as well as support from intelligent agents such as shopbots (shopping "robots" that access vendor Web sites, compare prices etc.). Examples of the use of ontologies/taxonomies to support searching and browsing can already be seen at Yahoo Shopping and amazon.com.

Aims & Objectives

The importance of ontologies to the Semantic Web has prompted the development of *schema* extensions to existing Web standard languages: XML has been extended to give XML-Schema (XMLS), while RDF has been extended to give RDF-Schema (RDFS). However, the language primitives provided by these standards are extremely basic when compared with those typically provided by ontology languages developed within the Knowledge Representation (KR) community, and efforts are already underway to develop *ontology* extensions of these standards. The aim of WonderWeb is to develop the infrastructure required for the large-scale deployment of ontologies as the foundation for the Semantic Web. This will involve not only the establishment of a Web standard ontology language, but also the parallel development of the ontological engineering technology that will be required in order to "bring the web to its full potential".

The main objectives of WonderWeb are:

* The development of a family of **ontology languages** that extend existing Web standards while maintaining maximum backwards compatibility.
* The development of a framework of **techniques and methodologies** that provide an engineering approach to the building and use of ontologies.
* The development of a set of **foundational ontologies** covering a range of application domains.
* The development of the **comprehensive technical infrastructure** and tool support that will be required by real world applications in the Semantic Web.

Contribution and Impact

WonderWeb directly responds to the following EC policy challenges:

* Helping in the aim of creating a user-friendly information society by providing non-discriminatory access to services by individuals and businesses.
* Stimulating the dissemination of results and applications in all areas, with special emphasis in Web based applications, e-commerce, knowledge management and information integration
* The scientific community and companies will clearly benefit from this globalisation of services, through improved access to ongoing research, resources and available technology.
* The work envisaged by WonderWeb must be undertaken at a European level, as the skills in ontological engineering, knowledge management, tool development and e-commerce are widely dispersed in European laboratories and companies.
* WonderWeb also provides significant contributions to EU policies towards SMEs. European SMEs will be able to exploit emerging ontology-based technologies for automated services from the very beginning, and will therefore gain competitive advantage in these very fast developing markets. New business opportunities can be generated by exploiting these techniques and new products and services can be created, developed and brought to the market place ahead of other competitors.

WonderWeb will provide the technical know-how for and a demonstration of a real Semantic Web.

Project Consortium

Members of the consortium are leading efforts to develop Web ontology languages and are leading developers of Web tools, technologies and ontologies.

Project Coordinator

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Academic Partners

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Free University of Amsterdam (NL)

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Industrial Advisory Board

WonderWeb's industrial advisory board includes leading providers and users of Web technology, including:

ISOCO (E), **Canon Research Centre Europe** (UK), **InGenuity Systems** (USA), **Network Inference** (UK), **Photonica** (UK), **BT Advanced Communication Technology Centre** (UK), **CognIT** (N), **IOSPress** (NL), **IBM Tokyo Research Laboratory** (J), **Assistum (High Level Systems)** (UK), **France Telecom** (F), **GlaxoSmithKline Pharmaceuticals** (USA), **aidministrator** (NL), **T-Nova Deutsche Telekom Innovationsgesellschaft** (D), **Lucent Technologies** (USA), **biovista** (G), **Swiss Life** (CH), **ontoprise** (D), **Nomos Systema** (I), **AKT project, AIAI** (UK), **BioWisdom** (UK), **Merck KgaA** (D), **The Boeing Company** (USA), **IBM Rome Tivoli Labs** (I), **Shell Services International** (UK), **Sun Microsystems** (USA)

Find Out More

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WonderWeb

Ontology Infrastructure for the Semantic Web

WonderWeb is a shared cost RTD funded by the European Commission (IST, Action Line VI.1.1)

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