Background

Nowadays, organisations produce, during their daily activity, a huge amount of data and information, which is normally stored in heterogeneous information systems with diverse data formats. These companies are aware of the need of exploiting these intangible assets in order to obtained added value and competitive advantages in the market. They are demanding intelligent tools for searching and classifying information, and lately extracting knowledge from it.

On the other hand, XML has become rapidly the standard format for creating, archiving and exchanging information, as it permits to easily classify and extract knowledge from documents, while Web Services are self-describing, self-contained, modular applications that can be mixed and matched with other Web Services to create innovative products, processes, and value chains.

The convergence of these two technologies provides a sound basis for exploiting information and knowledge repositories. To this end, WebSI introduces a combination of innovative abstractions, technical solutions, interfaces, components, and design tools to support the business sector in the building of applications as composed Web services, thereby offering to a broad spectrum of enterprises a low entry cost technology, capable of collecting information and composing services from different sources.

Project objectives

WebSI aims to develop and demonstrate three suites of tools for developing data-centric Web applications in open architectures, including the ASP (Application Services Provision) framework. It is focused on new low entry-cost technologies: (i) a **design and development toolkit** providing a graphical interface, supporting the visual specification of Web sites, and a code generator transforming visual specifications of hypertexts, web services and workflow primitives into application code; (ii) a **service composition layer** offering the run-time environment for integrating services as specified by the design toolkit, as well as a focused environment for supporting event-driven composition of complex documents from the assembling of pieces derived from queries, service invocations or other existing documents; and (iii) a **data integration service** allowing the gathering of integrated and enriched information from a distributed and secured environment.

WebSI Data Centric Web Services Integrator

Participants

Technological partners:

Ibermática	Spain
xyleme	France
Politecnico di Milano	Italy

End users:

acer	Italy
Diputación de Huelva	Spain
tiscover	Austria

Project information

Project No: IST-2001-35458
Start date: 01.05.2002
End date: 30.09.2004
Duration: 29 months
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This work is partially funded by the European Commission under the Information Society Technologies (IST), RTD Programme, Contract IST-2001-35458.

European Commission

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IST-2001-35458

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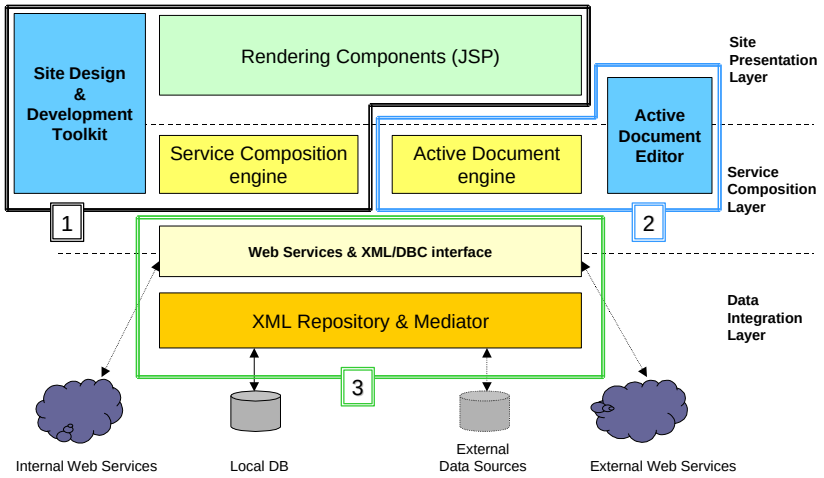
Information Society Technologies

Architecture and main components



1 WebML Suite

2 Active Documents Suite

3 Data Integration Suite

WebSI enables fast and easy development of applications and services in open architectures based on composition of existing and new web services. The **WebSI** Tools developed include:

1. The **WebML Suite**, which includes a graphical interface supporting the visual specification of Web sites in WebML, a high-level visual design language, and a code generator, transforming visual specifications into application code, a set of page templates (e.g. JSP pages) and unit descriptors which enable the execution of the application in the runtime environment.

   The initial version supporting the specification of hypertexts and the graphical interface is now extended to allow composition of Web services and incorporates the units needed to specify Web services conversations and workflows, including message queuing services to allow the asynchronous interaction with remote Web services.

2. The **Active Documents Suite**, which consists of a set of cooperative web services implementing a distributed event-handling architecture and an editor of active documents. Active documents allow composing complex documents from the assembling of pieces derived from queries, service invocations or other existing documents in long-running event-driven stateful sessions.

   The core web service in the suite is the Active Documents Manager, which manages the whole lifecycle of active documents. The suite includes additional web services like the Event Manager (for dispatching of XML-based events on the network), the Xcheduler (for registering of schedules and generation of the corresponding time events), and the XMail (an XML-based email server).

3. The **Data Integration Suite** transforms a set of local or remote data sources in an XML view accessible as a Web service through XQuery, the W3C XML query language. The XML/DBC interface offers a set of functions to query the XML view through a Java and SOAP APIs similar to JDBC but designed for XQuery. The suite includes the following main components:

   - The **XML Mediator (XLive)**, a data integration middleware receiving XQueries, distributing them to sources and then returning integrated XML answers. Relational data sources are connected to the system through wrappers (XMLizer).
   - The **XML Repository**, which manages persistent collections of XML documents in a native XML file system and provides query access to them. It supports W3C XQuery and XML Schema standards, user access and authentication through Access Control Lists, a notification manager that allows typical subscribing service, and support of several European languages for stemming and semantic features. It can work also as a source underneath the Mediator.

The three tool suites will be usable within the ASP Infrastructure, providing also the hosting of internal services and databases. Three applications are developed to focus the design on real problems, demonstrate the **WebSI** technology, and to ensure market needs feedback.

Advantages and benefits

In this context, the major business benefits that **WebSI** provides are the following:

- It allows quickly design, development and deployment of web services- and XML-based advanced and complex solutions in distributed environments through the use of high-level tools like WebML toolkit and AD editor.
- It allows low-cost exploitation of data sources and contents available within organisations, and the building of advance content-based and knowledge-based solutions.
- It facilitates a better control over the lifecycle of the contents as well as the personalisation of contents and services made available all over organisations.
- It facilitates the development of a flexible and extensible architecture with open interfaces based on web services.
- It enables SMEs to catch up the technology race in IT field, through low investment solutions.
- There is a potential market for **WebSI** suites in the Application Service Providers sector, that will find in the three suites the way to build innovative solutions and services (a 25% of ASP's customers are SMEs).
- The synergy between ASP and Web Services can give rise to new business models and opportunities, based on a wider vision of the traditional ASP paradigm: Service Providers, where companies will be able to interact directly over the Internet publishing specialised services on information and knowledge that can be engaged in complex applications using external IT infrastructure providers to host software and hardware resources, fostering.

Target audience

Industry sectors, including the service industry, and both the private and public sectors. Special focus on SMEs with needs on EAI, e-Business and Knowledge Management.