

SEWASIE

SEMantic Webs and AgentS in Integrated Economies (IST-2001-34825)

ANNUAL REPORT 2002

1. SHORT PROJECT DESCRIPTION

SEWASIE is a 36 months research project, started in May 2002. SEWASIE aims at implementing an advanced search engine, which will provide European SMEs with intelligent access to heterogeneous information on the Internet. This will overrun current information retrieving tools, that often are difficult to use and produce pages of links (mostly worthless) from a simple query.

Laying on an architecture that organises information on its semantic values, SEWASIE search engine will detect meaningful data, complying with users' preferences.

SEWASIE will also provide the system with communication facilities for business contacts. Integrating the searching and negotiating facilities in user-friendly interfaces, SEWASIE will reduce transaction costs for SMEs, powerfully enhancing their access to key technologies and business opportunities.

The SEWASIE architecture, as actually envisaged, is shown in Figure 1.

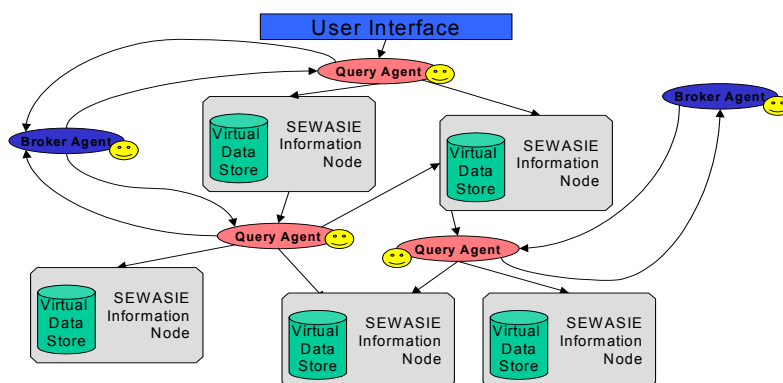


Figure 1. Architecture of the SEWASIE System

2. SUMMARY of 2002 ACTIVITIES

SEWASIE started on May 2002. Preliminary studies selected the basic common environment (methodologies, languages, tools) of reference for the project and the development and target platforms. This work set the guidelines for successive architecture specifications.

Guidelines for project performance evaluation were fixed, as well as guidelines for taking into account general security and privacy issues.

Technical activities always focused on potential end-users requirements, which had been assessed in the early stages of the project, through an overview on SMEs informative and business needs.

Specifications of the various system's components reached a first version by the end of the year. These versions will be progressively refined and integrated: 2003 will be very intense, since the release of first prototypes for each component is on schedule.

3. MAJOR AREAS OF WORK CARRIED OUT IN 2002

3.1. TECHNOLOGY OUTLOOK AND INNOVATIVE FEATURES

SEWASIE will design and implement an advanced search engine that provides access via a machine-processable semantics of data, which can give the ground to structured web-based communication, overrunning current information retrieving tools. Multilingual ontologies will be created and maintained, with an inference layer grounded in W3C standards (XML, XML Schema, RDF(S)), that are the basis for the advanced search mechanisms.

The system will be an open and distributed architecture based on intelligent agents (brokers, mediators and wrappers) and will accommodate scalability and flexibility issues.

Special Query Agents will support users when querying heterogeneous web information sources. The query agent will move through SEWASIE information nodes and retrieve the information requested by the user. Information nodes are independent components that semantically enrich existing data sources by linking the data to ontologies and other metadata. The system will also be capable of real-life business evaluation of the results, developing tools which solve the problem in a usable, marketable way.

3.2. USER REQUIREMENTS AND RESULTING PRODUCT PROFILE

The final target of the project is the huge number of European SMEs, who need to synthesise information stored in different Web sites, data banks, CDs, data-bases, etc.,

The user profiles were identified depending on the different ways the SEWASIE software could be proposed and installed. Three kinds of utilisation were detected:

- a) "**End users**": simple *searchers*, either using charged or free searching services. The latter if the problem that requires a search activity does not need specific answers but only statistically reliable ones. In this case, the system supplies answers containing little information (for example a partial demonstration of a pay service to advertise it).
- b) "**Middle users**": experts of a problem using SEWASIE to create a service. They *create an ontology* which has to be reliable and precise. The created services are used by the end users described in point a).
- c) "**SEWASIE as integrator of Information Systems in a middle-large enterprise**": the user (directly or through a software company which sells SEWASIE) is able to face the problem completely managing the SEWASIE software. He knows how to create the necessary ontologies exploiting all the tools SEWASIE offers. This kind of user purchases the software and the know-how to manage it.

3.3. ENVISAGED SYSTEM ARCHITECTURE

Preliminary work was done to outline the general architecture of SEWASIE system. This gave the ground for the ongoing design of specific system components

The system architecture was designed as follows:

- A general framework will be responsible for the implementation of the semantic enrichment processes, leading to semantically-enriched virtual data stores (Information Nodes) accessible by the users. The created ontology must have a multilingual interface, based on a logical layer and coded using widespread W3C standards.
- A query agent will secure query management and information reconciliation, taking into account the Information Nodes. The Agent will detect commonalities among queries, determining the relevant nodes responsible for answering parts of the queries and it will split the queries accordingly. Finally, it will combine the sub-answers, providing the end-user with an overall answer to the original query.
- An information-brokering component will include methods for collecting, contextualising and visualising semantically-rich data. Intelligent information filtering and knowledge guidance services will be developed. Structured data will be linked to semi- or unstructured data via ontologies. The collected data will be visualised, showing search-related documents and result contexts.
- A communication tool will enable structured negotiation support (ontology based) for human negotiators engaged in business-to-business electronic commerce and employing intelligent software agents for some routine communication task.
- Two end-user interfaces, one supporting the design, management and storage of the semantic information associated to the nodes, the other as a tool for end-user query management and intelligent navigation will be developed.

3.4. MARKET PROSPECTS

SEWASIE project develops different tools that can be applied to different market contexts:

1. There are many *different application domains* where efficient search information is necessary, where the findings in the field of semantic enrichment of information available on the web can apply. For example, business-to-business electronic commerce.
2. It is crucial for SMEs *to find* the right information and *to be found* by possible customers or partners. However, these goals cannot be achieved with the current internet tools, thus more sophisticated *technology for searching and finding* adequate information is necessary.
3. SEWASIE can extend current products in the *business intelligence sector*, with specific reference to the supply chain management tools. The enhanced communication support can be applied to the management and optimisation of supply chains, especially to improve the collaboration between SMEs, which require flexible and low cost solutions, easily adaptable to their specific needs. Current solutions in this area are too complex to be useful for SMEs.

4. USER INVOLVEMENT, PROMOTION and AWARENESS

Users involvement is assured by the presence within the Consortium of a representative association of Italian SMEs (CNA). This partner is involved in the analysis of end users' requirements and is working on its associate SMEs and professional consultants in order to make the ground for future field tests. In particular, two specific industrial sectors (textile and clothing industry, mechanical industry) will be involved.

Promotional activities are running as well with the aim, in this starting phase of the project, to rise awareness of SEWASIE aims, methods and scope. The technological partners of the project are presenting SEWASIE possible outcomes in respective markets, while academic partners are mainly involved in spreading SEWASIE thematic through international conferences and presentations, raising the project's profile in the academic and scientific community.

5. FUTURE WORK

On the basis of first versions of the various system's components specifications, developed by the end of 2002, progressive refinement and integration activities will lead to the release of first prototypes for each component in 2003.

Studies about users requirements and potential organisational and economic barriers to the diffusion of the new technology envisaged by SEWASIE will reach a more detailed and specific level: on the basis of these studies, system tests will be designed to implement the demonstration phase, which will focus on two specific business sectors (textile and clothing industry, machinery industry). First tests will consider limited functionalities of the system (i. e. the prototype developed in 2003) and will be ran on a limited set of information sources. Following the indications given by these tests, the system will be revised and eventual problems solved.

Later on, system functionalities will be expanded (2 further releases of the system are expected) and the context for information retrieving made more complex. Progressive steps will always be tested, so that the research and technological effort will always keep the focus on end users needs.