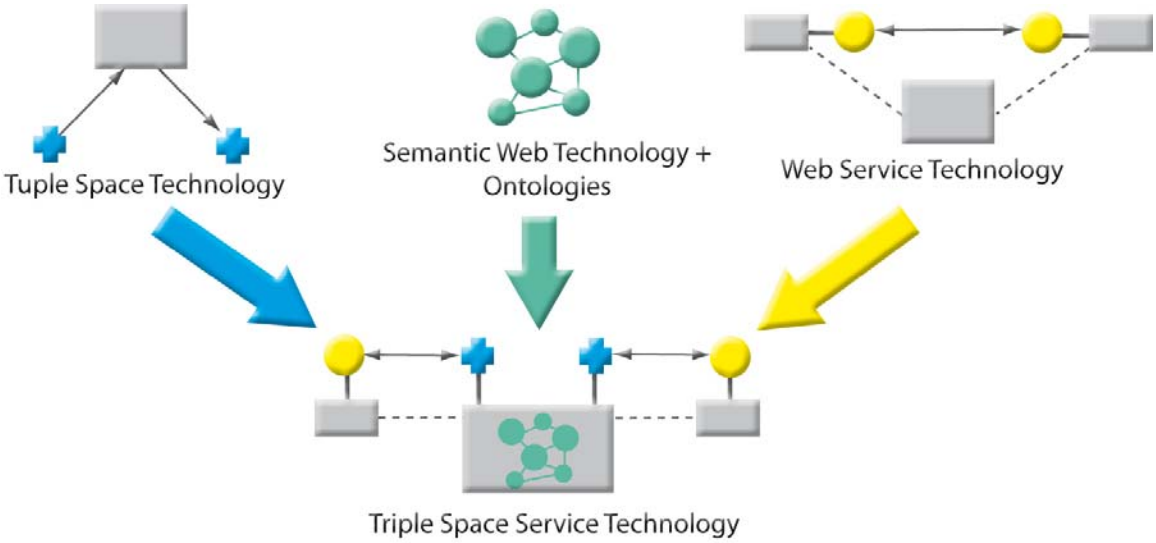
Annual Report

"TripCom will change the Internet usage through computers just as the Web revolutionized the Internet usage through humans"



The visionary approach of Triple Space Communication is based on the insight that Web Services do not follow the Web paradigm of 'persistently publish and read'. In this way TripCom brings machine-to-machine Web Service communication to the Web in its real sense: 'Web' Services. Moreover, Triple Space computing follows the same goals for the Semantic Web services as the Web for humans: re-define and expand the current communication paradigm.

< Summary of Activities >

TripCom has kicked off with a highly innovative vision for future communication on the Web. In the first project year, partners have quickly established good working relationships with one another and completed initialization work for their tasks and work packages, such as grasping the most current state of the art and carrying out requirements analysis to help concretely specify the functionalities of the envisioned Triple Space platform.

Furthermore, the groundwork has been made upon which all future work can be built: initial specifications of the storage, tuple management and access components as well as the alignment with Web Services, security & trust approaches and the overall architectural design. Parallel to this the use cases for Triple Space and their underlying ontological basis have been specified. First dissemination of project aims and vision has taken place, particularly to the eHealth community.

Finally, the Project Management Board, the Technical Management Board and the Exploitation Board have been constituted and begun work, first deliverables have been produced and work is progressing to plan. Hence, TripCom has efficiently and quickly taken hold of its ambitious vision and is already making very good progress.

< Important work areas >

Data Model

The core model for representing Semantic Web data is *triple-based*. Each tuple contains three fields corresponding to the subject, predicate and object of an RDF statement, respectively. RDF allows for grouping triples in so-called RDF graphs. The same data structure is supported by triplespaces to provide means for communication and coordination based on nested or interlinked triples. Further on, the triple model forms a feasible basis for further extensions to support more complex representation languages such as OWL or WSML, which can be represented as triples as well.

The global information space can be structured as a tree of uniquely identified non-overlapping sub-spaces in order to increase the scalability of the system at Web scale.

The triplespace is formally described by an ontology capturing information about the contained data, the space structure, its access policies, rights of use etc. This is useful for the selection or exchange of sub-spaces by agents as well as automated mediation for secure access and rights protection.

Interaction Patterns

Interaction patterns - defined as behavioural dependencies between communication partners - are a major factor in the research work of TripCom. From a high-level perspective, they can be

- data-oriented in nature, e.g. in the form of data retrieval operations ("what is the phone number of X?"),
- focused on more complex interactions, which are used to map business processes (e.g. "seller offers a product - prospective buyers place bid - highest bidder purchases") to exactly defined, executable workflows covering multilateral and transactional interactions, which are described through Web service interaction patterns and workflow languages, e.g. the Web Services Business Process Execution Language (WSBPEL),
- or dynamic, autonomous, agent-based interactions (e.g. "organise a journey to Sofia on June, 26th").

TripCom aims to support communication between Web-based services based on asynchronity and persistent publication. A prerequisite is that TripCom facilitates the entire interaction pattern styles mentioned above.

Use Cases

An EAI scenario and an eHealth scenario will be developed in order to demonstrate the innovative capabilities of TripCom.

EAI analysis has showed that TripCom can be an improved implementation of EAI solutions related to data and message communication level. In order to show TripCom benefits, we will develop a Digital Content Management use case, focused in content-based services management from a Service Provider perspective. The motivation for using this scenario is the dynamic, heterogeneous and interactive behavior inherent to this business context, which will help us to improve EAI current solutions for this domain.

TripCom contributes also to the European eHealth action plan by supporting the development of a European Patient Summary (EPS). EPS will be an infrastructure for authorized healthcare actors to access a concise clinical document for each citizen. The information in EPS is highly heterogeneous in format, data and behavior because it comes from various clinical sources across Europe. The scale of the problem in terms of data (a summary for each citizen) and users (some hundred thousand healthcare actors) is the main reason for the adoption of such a disruptive technology as TripCom.

< User Involvement >

< Promotion and Awareness >

Exploitation Board

The TripCom Exploitation Board has been constituted and an exploitation plan is being performed by each business partner in order to apply TripCom developments following a commercial perspective. Use cases will act as implementation examples that will lead EB members in finding suitable applications inside their enterprises where TripCom can be applied.

Co-operations

TripCom works actively towards becoming a member of the European Semantic Systems Initiative ESSI in order to contribute to its mission: to strengthen European research through close cooperation and to collectively promote ESSI research results to both industry and academia through joint.

Presentations at international events, publications, press and media coverage

- D. Cerizza, E. Della Valle, D. Foxvog, R. Krummenacher, and M. Murth: *Towards European Patient Summaries based on Triple Space Computing*, Proc. of 1st European Conf. on eHealth, Fribourg, Switzerland, 12-13 October 2006.

- E. Della Valle, D. Cerri, A. Ghioni, and D. Cerizza. *Triple Space Communication an infrastructure for seamlessly and securely sharing healthcare data.* In the Official Journal of the European Association of Hospital Managers, November 2006 (forthcoming).

- D. Fensel, R. Krummenacher, and M. Zaremba: *The Role of Semantic Technology*, Semantic Technology - A European Perspective during WWW2006, Edinburgh, Scotland, 23-26 May 2006.

- E. Della Valle, D. Cerri, A. Ghioni, and D. Cerizza: *Seamlessly and Securely sharing health care data with Triple Space Communication*, The Int'l Trade Event and Conf. for eHealth, Telemedicine and Health ICT (Med-e-Tel), Luxemburg, 5-7 April 2006.

- E. Della Valle, D. Cerizza, R. Krummenacher, L. J. B. Nixon, E. Paslaru-Bontas Simperl, and D. Foxvog. *A proposal for Building the European Patient Summary using Triple Space Computing*, Workshop for W3C Semantic Web Health Care & Life Sciences, International Semantic Web Conference (ISWC), Athens, Georgia, 6-Nov-2006.

- A. Polleres and R. Schindlauer. *SPAR2QL: From SPARQL to rules.* In International Semantic Web Conference (ISWC2006 - Posters Track), Athens, GA, USA, November 2006.

< Future Work >

In the coming year in TripCom we will be completing some important milestones. The individual components for Triple Space will complete their prototyping and evaluation so that storage, tuplespace management and access at the semantic level will be supported and form the core of the Triple Space runtime. A reference architecture and component model will be specified in which these components will be integrated.

From an implementation perspective the alignment with Web Services and the security and trust framework will be complete and ready to extend the Triple Space work. First prototypes will demonstrate the scenarios in eHealth and EAI. Finally, this progress will enable us to perform wider dissemination of TripCom to both academia and industry. Hence TripCom will see first fruits of its vision in concrete research achievements and real world scenario applications.

< Further Information >

Website http://www.tripcom.org

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