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PROJEKT OUTLOOK 14th November 2008

FUNSET Science - Future Network-based
Semantic Technologies

LEADING INSTITUTION
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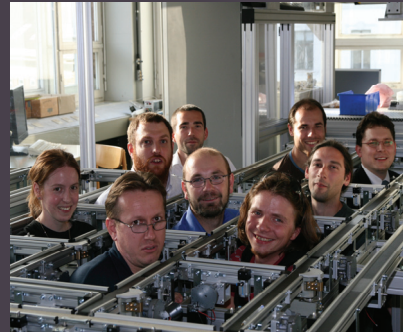
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Future Network-based Semantic Technologies

The capability of enterprises to form network organizations (Virtual Enterprises) and cooperate with partner is an important factor for competitive market position. The information and knowledge exchange between partners play a critical role for the success of such networks. It is of biggest importance to have an optimized information flow to find the appropriate knowledge source in the desired quality and in adequate time). In current networked organizations it is usually not transparent to the partners, which knowledge is available at which partner's site. Our approach is to use semantic technology together with software agents in order to improve knowledge capturing, knowledge reuse and knowledge transfer. The software agents are used within a complex virtual company to control certain components and processes (domains). Semantic means in this context that all relevant concepts important for SMEs will be modelled in an ontology by capturing the associations between the domains ensuring at the same time the understanding of exchanged knowledge during the inter-agent communication. This allows business partners to build open communities that define and share the semantics of the information exchanged in their domain. The development of ontology for the most SMEs is still not very common, as many companies hesitate to start this resource-intensive process. The goal of the project is to develop and implement the concepts for the applications of the semantic and software agent technologies in particular SMEs and to present the best practice as well.

The project is currently in the start phase, where the students are being introduced into the fundamentals of the project. On the other hand, we are also looking for appropriate project partners from industry. The basic preparations such as website and literature selection are already done.

Technological objectives:

- Development of an ontology-based multi-agent architecture for the knowledge exchange and process control in virtual enterprises
- Design and development of a persistent ontology and the achievement of semantic interoperability between heterogeneous, inter- as well as cross company levels.
- Establishment of conditions for the easy introduction of knowledge-based techniques, and multi-agent systems in virtual enterprises.
- Exploration of technologies and the creation of the conditions that should bring semantic and agent systems nearer to commercialization and industry

Project Outlook, 14th Nov 2008, Dr. DI Munir Merdan, merdan@acin.tuwien.ac.at

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Scientific questions:

- Which multi-agent architecture is best suited for the creation of distributed knowledge systems in the field of virtual enterprise?
- How do the ontologies influence a development of distributed knowledge systems and which role are they playing during the knowledge sharing and reuse process? Will the interoperability problem really be solved through the use of ontologies?
- What conditions has to be met or which methods and tools developed in order to support knowledge-intensive tasks and processes in heterogeneous systems (such as virtual companies)?

Previous Study

The Automation and Control Institute of the Vienna University of Technology has, within the framework of the project financed by the Vienna Economics Chamber, the study "Roadmap for the movement of SMEs towards semantic knowledge-based systems" accomplished. The results of this study have shown that almost 40% of companies are having the difficulties in data exchange with other business partners, since the data are not represented in uniform format. Other 51% confirms that the amount of manual data processing is too high. For almost 62%, be the optimization of business processes and improving cooperation with business partners, would the main reason, to introduce a new IT system.
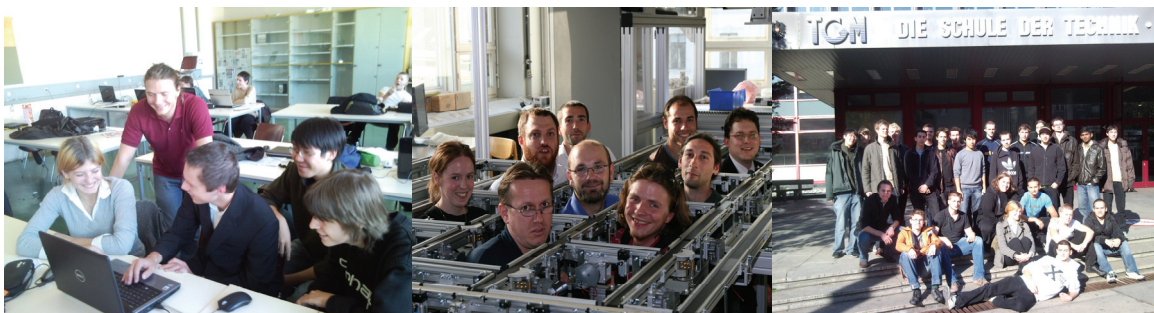
Citation from researchers, teachers and students:

„I think that the Sparkling Science is a perfect idea to increase the interest of many students to take a part in research.." (Munir Merdan - Projectleader)

„This Program breaks the gap between university and high school education and brings both sides tremendous potentials." (Gottfried Koppensteiner – Projectcoordiantor and Teacher)

„We hope that this project will bring us a better start in to the after school life. We also think that we work on a very interesting and actual topic, which will be even more important in the future" (Flandorfer Lukas, Grabler Reinhard, Grüneis Nino, Wagner Emanuel - students)

„Our motivation is the possibility to participate and work on a big innovation project with important partners i.e. companies. Besides, we are looking forward to make an insight into the research processes." (Klaudinger Alexander, Lausch Sascha, Peitl Michael, Reznicek Alexander - students)

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