REWERSE – Annual Public Report 2005

Reasoning on the Web with Rules and Semantics

http://rewerse.net

For the full exploitation of the Semantic Web it is necessary not only to describe meta-data but also provide languages and methods to query and to automatically *reason* over these data, i.e. to derive new not explicitly stated information from existing data using various forms of *rules*. The main objective of the EU Network of Excellence REWERSE is to network and structure a scientific community (i) to develop a set of inter-operable *rule-languages supporting* various forms of Web *reasoning*, (ii) to provide *support tools* for reasoning on the Web like rule modelling, verbalization, visualisation, explanation tools and (iii) to test these reasoning tools and technologies on various Semantic Web *application* domains, e.g. reasoning with business-rules, policies, Bioinformatics Semantic Web, personalisation, temporal and spatial reasoning.

Summary of Activities

The focus of REWERSE is the definition of languages and support tools for reasoning on the Web and the application of these technologies in different application domains. In its first months REWERSE has defined requirements and base components for the different technologies accompanied by thorough state-of-the-art surveys. At the end of year one use cases for the respective technologies have been defined that all require rules and reasoning for satisfactory realisation. In year 2 REWERSE has been implementing first prototypes of the respective technologies. More concretely, the languages, use-cases, prototypes and applications that are worked on concern: rule markup languages, policy specification, typing and composition of rules, querying and transformation, reactive behaviour and evolution of information, geotemporal and geospatial reasoning, bioinformatics data integration and personalisation on the Web.

REWERSE has organised three major dissemination events in year 2: the first “Reasoning Web” Summer School (July 2005, Malta), the industry awareness event “Semantic Web Days” (October 2005, Munich) and the research workshop “Principles and Practice of Semantic Web Reasoning” (PPSWR’05) (September 2005, Dagstuhl).

In year 3 REWERSE plans to refine and test its demonstrators and prototypes thus showing the power of the new paradigm for rules and reasoning on the web. The dissemination of the results will be further extended via annual summer schools, refinement of university and industry teaching material and infrastructure, technology transfer events, and the research workshop PPSWR.

Important Work Areas

The network REWERSE focuses on three core work areas: research on Web reasoning languages and their processing, advanced Web applications requiring reasoning, and knowledge dissemination activities spreading the results to a broader audience. A tight synergy between the different work areas is taking place.

Work Area: Web Reasoning Languages and Their Processing

REWERSE integrates five research oriented working groups on Web reasoning languages and their processing.

Rule Modelling and Markup (I1). Many applications like car rental systems or mortgage loan offer systems are appealing to be made available on the Web. The processes underlying these systems are often built on the basis of business vocabularies and business rules. To make the applications available on the Web requires to formulate the vocabularies and rules in a suitable machine-processable way and to define reasoning mechanisms that can be *automatically* executed on the Web.

The major goal of the REWERSE working group I1 on "Rule Modelling and Markup" is to develop tools and finally an integrated framework for modelling, visualisation, verbalisation and markup of rules such that the practical use of rule formalisms on the Web is facilitated. On the Web and in distributed systems in particular *rule markup languages*, i.e. languages that are the common basis for defining various concrete application-specific rule languages, will play a central role since they allow deploying, executing, publishing and communicating rules on the Web, or to exchange rules between different systems and tools. A first challenge for the group I1 is to express vocabulary, facts and rules in one *visual* model for ease of usability for the end-user. Ideally, facts and rules also have to be *verbalised* for non-experts, and finally a suitable markup language is needed to publish vocabularies and rules on the Web, and to exchange them between different systems and tools.

The group I1 has developed elements of a UML based *visual* rule language; furthermore it has defined a pattern-based *verbalization* of fact types and rules (I1CE), and an abstract syntax of rule markup languages based on OWL, SWRL and RuleML, and expressed in MOF/UML is being defined (called R2ML). Furthermore, an extension of the Semantic Web language RDF is proposed (called ERDF) required for reasoning with rules on the Web. A clean semantics for ERDF has been given.

Policy Specification, Composition and Conformance (I2). The group I2 on "Policy Specification, Composition and Conformance" deals with rules that enhance user privacy on the Web and that improve Web service usability. This is for example needed when granting access to a restricted Web service (e.g. downloading restricted project information) or performing a transaction on the Web (e.g. an order in a Web store) which requires mutual trust. The rules for establishing trust (policies) have to be formalized to make them machine understandable and a Web service has to generate explanations for the human users.

The goal of I2 is therefore to design policy languages (that are flexible, powerful and computationally efficient) and policy-driven systems that enhance user privacy, Web service usability and protection, and improve user control on the policies applied by open systems and services. Ideally, the systems will also provide explanation facilities. Many of these mechanisms require reasoning with policies.

A typical use-scenario consists of granting a person access to a restricted Web service. This requires a mutual interaction, e.g. given the system has a policy "Only persons that are at least 18 years hold will have access." requires input about the age of that person. To improve service usability, many of these interactions will be controlled automatically. This requires suitable languages to express and intelligent tools and systems to process and reason with policies, to generate dialogues, and to adapt the system behaviour to different situations. The main challenges therefore consist of defining machine understand-

able representations of policies, providing user-friendly ways to specify and explain policies (e.g. using controlled natural language), and diverse rule-based reasoning.

Facing the challenges the group I2 has given a specification of the REWERSE policy language Protune (a flexible policy language for security policies, trust, reputation and for business rules), has implemented a controlled natural language parser (Attempto Controlled English) that tackles the peculiarities of policy specification and policy querying, Furthermore, the group has defined a verbalisation of formal languages into the controlled natural language ACE. For all systems demonstrators have been developed.

Composition and Typing (I3). The success of the future Semantic Web depends on that applications can be produced very quickly. To this end, an appropriate reuse technology should be developed that treats many different ontologies, and also different ontology languages. For reuse, type systems and component models play a major role. Type systems provide reuse from the programming languages' point of view; component models provide reuse from the application point of view.

The goal of the group I3 is to create a composition framework for the joint use of different rule and ontology languages. Furthermore, a type system for REWERSE Web reasoning languages is developed. Interesting application fields are Web shops for companies from *different* application domains that are individually tailored yet based on re-usable inter-operable components. Reusability of components allows users to develop new Semantic Web applications much more quickly. For reuse type systems and component models play a major role. Therefore the main challenges are to integrate different rule/ontology components and to enhance inter-operability.

The group I3 has developed the elements of a first version of a universal component model and composition technology (called COMPOST) for rule and ontology languages. Furthermore, I1 has investigated typing of REWERSE rule languages, in particular I4's Xcerpt, and the group has developed a prototype tool for automatic derivation of a component model for any language given the description of the language as a meta-model in the Web Ontology Language OWL. This result can be generalized for the Web query languages developed within REWERSE.

Reasoning Aware Querying (I4). Querying, i.e., the efficient and effective access to data, is one of the most essential enabling technologies for any information system. In the Web context, reasoning capabilities enhance traditional search and access technologies to be able to cope with heterogeneous, incomplete, and often even inconsistent information.

Since existing Semantic Web query languages lack a *general* support for querying and reasoning the goal of I4 is to develop a Web query and transformation language that enables more "meaningful" access to Web and Semantic Web data by integrating powerful but easy to use reasoning capabilities into the language. The technology is useful where a "traditional" Web search produces many results that need human interpretation, while using a query language that has flexible query and reasoning facilities would allow to automate the "filtering" from large selections of data (such as those returned from a traditional search engine). The main challenge is to guarantee the versatility of the query language, to design the language such that conventional data and meta-data are interchangeable, and to enhance user-friendliness by providing a visualisation and verbalisation of the language.

The language developed in the group I4 is called Xcerpt. The language has three major features: integrated access to, both, standard Web data (in XML) and upcoming Semantic Web information (in RDF, Topic Maps, or OWL), powerful but easy-to-use reasoning

capabilities and easy extensibility for new Web technologies. The possibility to access with Xcerpt data in different representation formats within the same language is realized by a rule-based, pattern-based, "query-by-example" style. Furthermore, a user-friendly visualisation of Xcerpt (visXcerpt) is available. A prototype implementation of both Xcerpt and visXcerpt are available. Furthermore, the group has worked on an efficient implementation of Xcerpt using an Abstract Machine. The group has given a precise language specification allowing other REWERSE groups to use the query language Xcerpt. Furthermore, the semantics of Xcerpt has been defined. This work resulted in the language Xcerpt being widely used by other REWERSE working groups.

Evolution and Reactivity (I5). The Semantic Web can be seen as a "living organism", combining evolving data sources and knowledge repositories. This dynamic character of the Semantic Web requires languages and mechanisms for specifying its maintenance and evolution. Moreover, the Semantic Web resources may need to be reactive, not only to incorporate and propagate updates (e.g. a new flight schedule), but also in that they should perceive events (e.g. a flight cancellation) and incoming messages, communicate with other components (informing the business partner) and execute actions (e.g. booking an alternate flight). Dealing with evolution and reactivity on the Web requires reasoning based on rules.

Working group I5 therefore works towards the definition of declarative rule-based languages, methodologies and tools for specifying evolution and reactivity in the Web and in the Semantic Web. A typical scenario is when you are offered a set of resources of travel agencies and airline companies on the Web and your goal is to make reservations via travel agencies and then *automatically* make the corresponding airline company aware of your reservation and finally to be automatically informed in case of changes as to your original reservation. The main challenges are to *specify* updates in a distributed scenario, and to define and implement languages for *propagating* the updates.

The group I5 has been working on the language XChange, a declarative high-level language for programming reactive behaviour, evolution, and distributed applications on the Web. XChange embeds the facilities of Xcerpt, the query language developed by the REWERSE group I4. A prototype of XChange is available. Since the Semantic Web is heterogeneous it is not only important to have a concrete language for dealing with evolution and reactivity, but also to have a more general framework for dealing with the described challenges in the Semantic Web. These frameworks for the Semantic Web are ideally modular, and the *concepts* and the actual *languages* are independent. The group I5 has proposed the foundations of such a general framework that is based on a general Event-Condition-Action (ECA) language. The group is currently working on a prototype implementation of general ECA engines.

Work Area: Reasoning for Advanced Web Applications

REWERSE integrates three working groups on Web applications focusing on adaptive Web systems and Web-based decision support systems. The applications function as testbeds for the reasoning languages developed in the research oriented working groups.

Event and Location (A1). Almost all developments in the Semantic Web area –XML, RDF, query languages, rule languages, ontology mechanisms, etc. – are frameworks with very little built-in support for non-trivial concrete datatypes and theories. The frameworks would become much stronger and much more user-friendly if frequently used concepts could be directly integrated.

The working group A1 on “Event and Location” develops theories for “geotemporal” notions (*next Christmas*), “geospatial” notions (*closest pharmacy*), and for topics (*music event*) ready for the integration into, for example, query languages or ontology mechanisms. A use-scenario is for example if you query a Web based XML database about cinemas and movies in Munich e.g. with “Which cinema in the eastern part of Munich plays a movie about a sports event this weekend?” This query combines temporal (*this weekend*), spatial (*eastern part of Munich*) and topical (*sport event*) information. Reasoning is required to match “eastern part of Munich” for example with addresses in a database (geospatial reasoning), “this weekend” to a personal specification of “weekend” (geotemporal reasoning), and it must understand the topic “sports event”. The primary goal of the group A1 is to provide the theoretical and implementational basis for the integration of this kind of reasoning into the REWERSE query languages. The main challenges concern first the development of precise and versatile theories, and then the integration into XML query languages, ontology specification systems and logic based inference systems.

The application group A1 has developed and implemented the CTTN System, a system that gives a Computational Treatment of Temporal Notions, and has worked on the Geo-Temporal Specification Language GeTS, a functional language for specifying temporal notions. Furthermore, the language CaTTs has been further developed and a prototype is implemented. CaTTs provides a calendar and time type system and language to declaratively specify calendars (e.g. different cultural calendars, like Gregorian or Hebrew calendars, or different business calendars). The system is enhanced with type checking and a calendar constraint reasoning for example to solve temporal constraints when scheduling a joint business meeting (e.g. “Find a period of three consecutive working days in May 2006 such that every project member can attend the meeting.”). As for geospatial reasoning the group has defined a formal OWL-based ontology for Transportation Systems (OTN). The result is OTN, an Ontology for Transportation Systems. Furthermore the group demonstrates a particular use of transportation network ontologies for visualising maps in a browser window. The approach is extremely flexible and easily extendible to include all kinds of information in the generated maps.

Bioinformatics Semantic Web (A2). With the explosion of online accessible bioinformatics data and tools, systems integration has become very important for further progress. Currently, bioinformatics relies heavily on the Web. But the Web is geared towards human interaction rather than automated processing. The REWERSE group A2 on “Bioinformatics Semantic Web” works on using rules and reasoning for annotating and extracting biological data automatically. The group deploys rules and reasoning for ontologies and text mining, gene expression data analysis, metabolic pathways, structure prediction and protein interaction. Enabling these tools on the Web sets the foundation for a *Semantic* Web for bioinformatics.

Imagine a scientist is searching for genes with certain properties that are likely to be responsible for a certain disease. To find genes with the respective properties from the online accessible data currently requires time-consuming manual search since the data on the Web are not designed for automated use. Solving this problem and retrieving information from Web data sources automatically requires a suitable annotation of the data, the possibility to formulate complex queries and rules for the mediation of the different data sources, techniques for the consistent integration of different Bioinformatics data and – to enhance user-friendliness – adaptive portals for molecular biologists.

The goal of the REWERSE Bioinformatics Semantic Web group A2 is to demonstrate novel, reasoning-based solutions for the above requirements. The group is building pro-

totype applications to demonstrate the idea of a rule-based Web for bioinformatics thus providing an ideal test field for various Semantic Web technologies.

The REWERSE group A2 has developed an ontology based literature search engine GoPubMed (http://www.gopubmed.org), a database to determine protein structure interactions, various tools for protein structure prediction have been developed, rule based reasoning engines for metabolic pathways have been defined. Furthermore, various tools to work with biomedical ontologies have been developed. In particular, the language Prova is used to query and reason over ontologies. Several demonstrators are available. The realization of the A2 technologies requires the results of the research oriented working groups of REWERSE.

Personalized Information Systems (A3). The idea of the Semantic Web in which machines are enabled to understand the meaning of information calls for smarter applications that better support humans in carrying out their tasks. In particular, applications are interesting that can retrieve, process and present information in enhanced user-adapted ways. The Semantic Web thus calls for "Personalized Information Systems", i.e. information producing systems that can autonomously inter-operate – either with humans or with other systems –, tailoring their processing and its outcome to specific requests.

The goal of the REWERSE group A3 on "Personalized Information Systems" is to optimize the access to digital information on the Web according to the needs and requirements of each end user. The work of A3 involves three action lines: theoretical foundations of personalization in the context of the Semantic Web, algorithms and implementations of personalization functionality in the Semantic Web, and – in close co-operation with other REWERSE groups – test and validate rule and reasoning languages for the purpose of personalization. The latter is particularly interesting since to realise powerful Personalized Information Systems on the Web the reasoning mechanisms investigated in REWERSE are highly relevant, in particular reasoning about policies, mechanisms for handling failure, dealing with updates and events in the Web context, etc. Possible use-scenarios of personalization on the Web are manifold. The group particularly investigates personalized search on the Web, E-learning, tourist information systems, domotic systems, health care etc. The main starting challenges are the *automated* extraction of *semantic* information from the Web, the efficient use and implementation of personalization rules to reason over the data, and personalization and visualization services to syndicate the results.

Within its three action lines A3 has given an in-depth analysis of personalization techniques for the Semantic Web. As for specific personalization functionality, A3 has in particular been focusing on personalization techniques based on reasoning about actions, transforming and adopting adaptive hypermedia techniques, and rule-based user/learner modelling. Finally, A3 has been very successful in developing first prototypes of the "Personal Reader", a personalized semantic portal for REWERSE. A semantic portal allows the user to customize access to information by using semantic descriptions and helping the user to detect relevant information or relations. A first part of that Portal is the Personal Publication Reader generating a personalised collection of REWERSE project publications. In November 2005 the Personal Publication Reader developed by A3 has been awarded 3rd price in the Semantic Web Challenge 2005 (cf. http://challenge.semanticweb.org/). The REWERSE portal has been extended – among other functionality – with a user-friendly interface to aggregate news, appointments and To-Do's of the project. The portal functions as a testbed for further development and evaluation of reasoning for the Semantic Web.

Work Area: Knowledge Dissemination on Reasoning on the Web

REWERSE integrates Activities groups that aim at the dissemination of knowledge created within REWESE. Their goal is to spread excellence throughout the European region and outside of it in a way that guarantees a durable effect. REWERSE contains three activities: "University Education and Training", "Technology Transfer and Awareness", and "Presentation, Reviewing and Assessment". Recently, a group co-ordinating standardisation issues has been established.

Education and Training (ET). The main objective of the group on "Education and Training" is to initiate and foster a durable education on Semantic Web issues. The group focuses on three action lines: running a yearly Summer School, developing and publishing Web based courses, and developing Web based graduate curricula.

The ET group has very successfully organised the first Summer School "Reasoning Web 2005" which was held in July 25-29, 2005 at the University of Malta, La Valetta. There was a significant participation of 43 students. The focus of the Summer School was on introductions to foundations and techniques of web reasoning. Details of the program can be found at http://reasoningweb.org/2005/. A highly appreciated Summer School tutorial volume was published as LNCS3564. The next Reasoning Web Summer School with the focus on Semantic Web applications will take place in Lisbon, September 4-8, 2006.

Furthermore the group has – in co-operation with the Knowledge Web Network of Excellence – contributed to setting up the Web repository REASE, a repository of EASE for learning units in the area of Semantic Web (cf. http://rease.semanticweb.org). REASE supports sharing knowledge for Higher Education as well as for industrial education in the area of Semantic Web and is open to any member of the academic or research community. ET contributed a set of graduate courses, including the Reasoning Web 2005 electronic course material (slides, exercises). The ET group is currently working on a draft higher-education curriculum on Semantic Web topics. Furthermore, the group coordinates the involvement of REWERSE in the new European MSc in Computational Logic that is supported by Erasmus Mundus. Also the group is involved in preparing a preliminary proposal for a Semantic Web ontology.

Technology Transfer and Awareness (TTA). The goal of the technology transfer group TTA is to increase the awareness of REWERSE's results and research topics in industry. More generally, the group also aims at increasing the awareness of Semantic Web topics in general. The activities include in particular the organisation of awareness events and promotional material targeted at industry and the general creation of a technology transfer infrastructure within REWERSE. Furthermore, the group works – in cooperation with ET – on industry education, e.g. Web based courses, on Semantic Web issues.

The activity group TTA has organised the first "Semantic Web Days", a major industry awareness event that took place in Munich on October 6-7, 2005 (cf. http://www.semantic-web-days.net/). The event was supported by Knowledge Web. A major goal of the two-day conference was to present the latest Semantic Web technologies which are very promising or already in use. The conference consisted of workshops on industry relevant Semantic Web issues (e.g. business rules, ontology reasoning, business automated integration, bioinformatics). Furthermore, several companies and research institutions participated in an exhibition on Semantic Web technologies. The event closed with a panel discussion on the promising perspectives of the emerging Semantic

Web technologies. The event thus offered a forum for innovative companies and research institutions with the strong desire to accelerate the uptake of Semantic Web technologies.

The event attracted more than 100 participants, more than half of which were from industry. The event and the associated PR activities (press releases, mailings, flyers, radio interviews) considerably increased the awareness of REWERSE and Semantic Web topics in industry. Beyond that, concrete co-operations between industry and research have been initiated, e.g. in the area of literature search in bioinformatics.

The group has held further awareness events, e.g. at CeBIT 2005, XML Tage 2005, ESWC industry forum 2005, Semantic Web School Vienna and others.

The group currently develops teaching modules on Semantic Web issues targeted at industry. This includes the creation of an educational infrastructure for industry (together with the education and training group ET).

Presentation, Reviewing and Assessment (PRA). The activity group "Presentation, Reviewing and Assessment" is devoted to internal monitoring and assessment of the REWERSE results. Furthermore, the group aims at the presentation of REWERSE to the scientific and IT professional communities as well as to a wide audience of potentially interested people.

The activities of PRA included the further development and monitoring of internal assessment parameters, of presenting the REWERSE results (publications, deliverables, demos, meetings, presentation material, slides etc.) on the internal and external Website and the production of project presentations. Furthermore, PRA was strongly involved in the local organisation of the Dagstuhl seminar on "Principles and Practice of Semantic Web Reasoning" (PPSWR 2005) (cf. http://rewerse.net/PPSWR05/ and http://www.dagstuhl.de/05371/) that was held at Schloss Dagstuhl, 11-16 September 2005, Germany. The event contained the annual PPSWR workshop with the highly selective LNCS 3703 proceedings, additional talks on issues related to reasoning and rule languages on the Web, tutorials about REWERSE languages, and discussions with REWERSE internal and external researchers about reasoning on the Web. A pre-seminar press release has been issued by PRA and PRA will be involved in producing online post-proceedings of this seminar in the Dagstuhl seminar proceedings series. The seminar and the PPSWR workshop attracted a significant number of non-REWERSE researchers thus fostering the co-operation and mutual awareness. PRA furthermore organised REWERSE's participation at the FP 6 network collaboration workshop at ESWC 2005 (cf. http://www.eswc2005.org/workshops.html#framework), and the presentation of REWERSE as Project of the Month May at Knowledge Board II (cf. http://www.knowledgeboard.com/cgi-bin/item.cgi?id=140067).

Standardisation Task Force (STF). Since November 2005 REWERSE has a dedicated standardisation co-ordinator having the following main tasks: promote REWERSE research outcomes within standardisation organisations, influence the development of REWERSE related standards, provide feedback and collect input within REWERSE about standardisation issues, co-ordinating a REWERSE standardisation task force, and strengthen the contacts to the industry. Currently, the REWERSE standardisation co-ordinator is strongly involved in the W3C Rule Interchange Format Working Group (cf. http://www.w3.org/2005/rules/Overview.html). This Working Group is chartered to produce a core rule language plus extensions which together allow rules to be translated between rule languages and thus transferred between rule systems.

Since November 2005, REWESE holds a consortium membership at W3C.

User Involvement, Promotion and Awareness

Main Contacts and Co-operations

FP6 projects

- Knowledge Web (http://knowledgeweb.semanticweb.org/)
- Agentlink III (http://www.agentlink.org/)
- KnowledgeBoard 2.0 (http://www.knowledgeboard.com/)
- MUSCLE (http://www.muscle-noe.org/)
- PROLEARN (http://www.prolearn-project.org/)

Others

- Erasmus Mundus: European MSc in Computational Logic (http://www.computational-logic.org/)
- Semantic Web School Vienna (http://www.semantic-web.at)

Main Promotion and Awareness Events

Summer School “Reasoning Web” 2005

July 25-29, 2005
Valletta, Malta
http://reasoningweb.org/2005/

Semantic Web Days

October 6-7, 2005
Munich, Germany
http://www.semantic-web-days.net/

PPSWR 2005 ("Principles and Practice of Semantic Web Reasoning")

Workshop and Dagstuhl seminar
September 11-16, 2005
Dagstuhl, Germany
http://rewerse.net/PPSWR05/
http://www.dagstuhl.de/05371/

REWERSE as Project of the Month May at KnowledgeBoard

May 10-17, 2005
Online event
http://www.knowledgeboard.com/cgi-bin/item.cgi?id=140067

REWERSE at CeBIT 2005 future match activities

March 10-13, 2005
Hannover, Germany
http://www.futurematch.cebit.de/_2005/

REWERSE at ESWC Network Collaboration Workshop

May 29, 2005
Heraklion, Greece
http://www.eswc2005.org/workshops.html#framework

Awards

In November 2005 the Personal Publication Reader (http://www.personal-reader.de) developed by the REWERSE working group A3 has been awarded 3rd price in the Semantic Web Challenge 2005 (cf. http://challenge.semanticweb.org/).

Project-level involvement

Publications. At month 20 REWERSE members have contributed to over 200 internationally reviewed publications showing that REWERSE's focus is perfectly targeted to current research needs (cf. http://rewerse.net/publications.html).

REWERSE in the press. REWERSE is presented in a significant number of press reports, including a radio interview (cf. http://rewerse.net/press_releases.html). Many of the reports (mostly in German) have been initiated in preparation for the Semantic Web Days in October 2005. Weblogs show that access to the REWERSE homepage and the TTA homepage have significantly increased due to these activities. For example, from September 2005 to October 2005 the hits on rewerse.net have doubled.

Standardisation. REWERSE holds a W3C Consortium membership since November 2005 granting REWERSE members access to W3C working groups. REWERSE's standardisation activities include the establishment of a standardisation co-ordinator and a standardisation task force. REWERSE members participate in several W3C activities, in particular

- Rule Interchange Working Group (http://www.w3.org/2005/rules/wg.html)
- Semantic Web Health Care and Life Sciences Interest Group (http://www.w3.org/2001/sw/hcls/)

Meetings. Several project meetings and inter-WP collaboration workshops have intensified the co-operation within REWERSE and beyond.

Future Work

In year 3, the REWERSE demonstrators and prototypes will be put to the test by their integration into the applications of the REWERSE's A-groups, i.e. calendar and geospatial applications, bioinformatics, and personalisation application. This will demonstrate the power of the new paradigm for rules and reasoning on the web. In year 3, education and technology transfer will consolidate. The creation of the Virtual Institute of the Semantic Web Education is in progress; some courses in the planned graduate curriculum will be completed and offered. Additionally, the technology transfer centre will operate and downstream the existing results.

Planned events in 2006 are the Reasoning Web 2006 Summer School (Lisbon, September 2006), the workshop on “Principles and Practice of Semantic Web Reasoning” (Budva, June 2006, co-located with ESWC 2006), the co-organisation of a W3C Rule Languages Working Group Meeting (early summer 2006) and several activities by the technology transfer group.

Further Information

REWERSE Web Site	http://rewerse.net
Working Groups	http://rewerse.net/workinggroups.html
Technology Transfer	http://rewerse.net/tta/
Education and Training	http://rewerse.net/et/
Publications and Deliverables	http://rewerse.net/publications.html
Press	http://rewerse.net/press_releases.html
Demos and Downloads	http://rewerse.net/downloads_demos/
Contact	http://rewerse.net/contact.html

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