

The background is a solid red color with a white grid pattern. A large, stylized white letter 'S' is superimposed on the grid, starting from the top left and curving towards the bottom right. The grid lines are thin and evenly spaced.

Clarion Hotel, Stavanger

18 - 20 May 2009

Semantic Days 2009

Tutorials

18 May

Ordinary programme

19-20 May



WELCOME TO SEMANTIC DAYS IN STAVANGER

- the oil capital of Norway

Semantic Days is an annual conference that has become a meeting place for industrial use of semantic technologies with contribution from industry, research institutes and universities. This is the fourth year we meet in Stavanger.

Semantic technologies result from efforts to create a Semantic Web, available to people and computers alike. It opens up a whole new class of intelligent services and applications for the public web as well as corporate webs. Both industry and public services may greatly benefit from the enhancement of human-computer communication, improved information retrieval, data exchange and system interoperability offered by semantic technologies.

The semantic technologies comprise a set of standardized formats and languages that are used to give data on the web meaning, helping consumers and businesses to find, make use of and exchange online information.

Semantic Days 2009 focuses on ontologies based on domain standards and the use and benefits of semantic technologies in the oil and gas industry, the IT industry, the defence and defence industry and the public sector. Monday 18 May, two tutorials on semantic technologies will be given.

Nils Sandmark
Chair Programme Committee



TUTORIAL PROGRAMME MONDAY 18 MAY

1300-1700 Ontology-based data integration

The tutorial explains the benefits of using ontologies expressed in a fragment of OWL and reasoning over such ontologies for data access and integration by e.g. obtaining uniform access to data distributed over several data base systems using divergent schemata. We will discuss the basic issue underlying ontology-based data access and integration, including how to connect the terms in an OWL ontology to external data sources e.g. standard relational databases, and how to answer complex queries over these data sources and the ontology in a way that faithfully reflects the OWL axioms in the ontology and the established connections. We will also demonstrate the approach using a Protege plugin, OBDA, for specifying the ontology-to-source mappings, and a specific reasoner, QuOnto, for answering queries by exploiting an underlying relational database engine. A basic understanding of OWL and relational databases is an advantage, but experience in designing or using ontologies is not required.

Diego Calvanese, Professor, Free University of Bozen-Bolzano, Italy
Giuseppe de Giacomo, Professor, University of Rome, Italy

1300-1700 Enterprise architecture frameworks with semantic models as a foundation for complex networked operations

Enterprise architecture frameworks like Zachman, EIF (European Interoperability Framework) DODAF/MODAF/NAF (Defense Architectural Frameworks), TOGAF and others provide an important foundation for the understanding and planning of business models and system models for complex networked operations both in industry, eGovernment and crisis management/defense. This ensures both alignment between business and IT, and also provides a better foundation for system interoperability in networked systems. We will demonstrate the approach using ODM (Ontology Definition Metamodel) with OWL for semantic modelling, BMM (Business Motivation Model) and BPMN (Business Process Modelling Notation) and ARIS/EPC (Event Process Chains) with a transformation so system and service specification in SoaML (Service oriented architecture Modelling Language) with further realization in heterogeneous service oriented architectures (SOA) including web services, Cloud Computing/SaaS (Software as a Service), P2P/Grid and agents. We will show how semantic annotations from existing system specification to an ontology can support semantic interoperability. A basic understanding of business modelling or system specification is an advantage, but experiences in enterprise architectures, semantic models or any of the specific technologies that will be presented is not required.

Arne Jørgen Berre, Chief Scientist, SINTEF,
Dima Panfilenko, Scientific Assistant, DFKI, Germany

CONFERENCE PROGRAMME TUESDAY 19 MAY

Session 1 Keynotes session: Semantic Technologies – Needs and solutions

Chair: Nils Sandsmark, General Manager, PCA

Initiatives like integrated operations in the oil and gas industry, network based defence in the defence industry and eGovernment in the public sector, have greatly increased the needs for web-based data and system integration. This keynotes session will provide an overview of requirements from the different sectors and the semantic technologies becoming available to meet these requirements.

0900-0910 Welcome

Nils Sandsmark, Chair, Programme Committee

0910-0935 Integrated Operations Generation 2 - Potential and opportunities for the oil and gas industry

For several years we have invested large amounts of time and money on research and development in solutions for integrated operations. The Norwegian oil and gas industry is acknowledged as frontrunners in implementation of the first generation IO, ensuring improved communication between onshore and offshore operations and thus faster and improved decision cycles with increased production as a result. The second generation of integrated operations will also bring service companies tighter into the loop, through standardised data exchange and reduced communication barriers.

Richard Sagli, Project Manager, StatoilHydro

0935-1000 Simple Knowledge Organization System (SKOS) and linked data

Thesauri and classification systems reflecting human knowledge cannot always be engineered into precise ontologies. The W3C Candidate Recommendation (SKOS) provides a language for expressing such “simpler” constructs in RDF.

Thomas Baker, Kompetenzzentrum Interoperable Metadaten (KIM), Germany/
Co-chair, W3C Semantic Web Deployment Working Group

1000-1030 Coffee break

- 1030-1100 The experience of Web 2.0 Communications and Collaboration tools in a global enterprise - The road to 3.0.
- The Web 2.0 evolution inside Cisco displays the power of Web technologies within a global organization. Web 2.0 and collaboration tools provide just in time expertise sharing, which brings the right expertise at the right time to solve business issues. This enables a creative innovation environment for optimized business and IT alignment. Key drivers, trends and challenges with deploying collaboration/ Web 2.0 Cloud Computing technologies at Cisco will be addressed. Does this road extend to Web 3.0: The Semantic Web?
- Rich Gore, Senior IT Manager, Cisco IT, USA
- 1100-1130 Semantic interoperability for public administrations in Europe – Challenges and solutions
- The talk will present the challenges faced by public administrations in Europe with regards to semantic interoperability and how the EU is addressing them, including approaches such as the IDABC EIF, European Interoperability Framework and Semic.eu.
- Klaus Reichling, Advisor, IDABC, EU Commission, Belgium
- 1130-1200 Norwegian experience with meeting public sector interoperability requirements
- This talk will present an overview of various activities in Norway related to handling semantic interoperability between various public sector organisations, and between the public sector and the industrial sector. This work will also be related to the similar European activities presented in the previous keynote.
- Kristian Bergem, Senior Adviser, Agency for Public Management and eGovernment
- 1200-1300 Lunch

Session 2: Applications of semantic technology

Chair: Terje Aaberge, Researcher, Western Norway Research Institute

The real value of semantic technologies in the oil & gas and other industries becomes apparent when ontologies, reasoning engines etc. are applied to help people solve real-world problems. This session will provide early examples of such applications.

1300-1330 Towards an ontology-driven enhanced oil recovery decision support system

We present the results of several ontology pilots we have developed at the University of Texas at Austin. The pilots are used for learning the feasibility of a long-term project to develop a much needed comprehensive enhanced oil recovery decision support system.

Emilio Núñez, Assistant Director for Research Relations, University of Texas at Austin, USA

1330-1400 Ontologies for geological CO₂ storage studies

From 2001, Institut Français du Pétrole (IFP) and Ecole des Mines de Paris (ENSMP) have developed a new knowledge-driven paradigm for reservoir studies based on the belief that geo-model building should not be directly dependant from data (data-driven) but rather from geoscientists' interpretations (knowledge-driven). From 2006, this same paradigm is being applied for CO₂ storage studies within a joint research project (e-Wok Hub project) associating professionals and researchers from various French institutions. This multi-disciplinary research group is presently studying solutions for extracting and managing interpretation obtained from various types of documents in relation with practical users' questions concerning potential CO₂ storage site selection and assessment. We will present two use cases considered within the e-Wok Hub project, which respectively concern documentary search and subsurface modelling. We will then define a knowledge-driven methodology based on semantic annotation, which can be used in both cases. We will finally explicit the ontology based solutions that we are presently studying for operating this methodology.

Jean-Francois Rainaud, Dr., Institut Francais du Pétrole, France

- 1400-1430 **The semantic web promises a smarter electricity grid**
- The Smart Grid cooperation requires huge distributed information system. The presentation shows how the semantic web can help managing the distribution and heterogeneity of this information system.**
- Dominique Gabioud, Professor, University of Applied Sciences,
Western Switzerland**
- 1430-1500 **Unleashing the power of ontologies in information integration**
- Presentation of different studies for the application of novel ontology-based technology for data access and integration. We will illustrate the added value of semantic technologies and also discuss the performance bottlenecks that we encountered.**
- Diego Calvanese, Associate Professor, Free University of Bozen-Bolzano, Italy**
- 1500-1530 **Coffee break**

Session 3: Ontology tools

Chair: Jon Atle Gulla, Professor, NTNU

As an encouraging sign of the maturing of semantic technology, software tools for building industrial strength application are becoming available, both as commercial products and in open source form. In this session we will learn about a representative set of such tools, including ontology construction tools, systems for semantic content management, triple stores for efficient storage of semantic data, etc.

1530-1600 Methods and tools for semi-automatic ontology engineering

Expressive ontologies are an important prerequisite for a growing number of knowledge-intensive applications emerging from semantic web research. This presentation gives an overview of methods and tools for the semi-automatic construction of more expressive ontologies, while at the same time highlighting some of the biggest challenges for future ontology learning and engineering.

Johanna Völker, Research Associate, University of Karlsruhe, Germany

1600-1630 QuOnto: Ontology-based data access and integration using relational technology

QuOnto is an ontology-based system that is capable of reasoning over ontologies that contains large amounts of instances, typically stored in external memory. Besides the usual reasoning services, such as ontology satisfiability, subsumption and instance checking, QuOnto fully supports answering complex queries that involve unrestricted forms of joins and selections (i.e. union of conjunctive queries). In this talk we will present QuOnto, its foundation and its use for ontology-based data access and for data integration.

Giuseppe de Giacomo, Professor, Sapienza University of Rome, Italy

1630-1700 Advanced geotemporal reasoning in RDF

Enterprises have begun utilizing semantic technologies and standards for knowledge representation, knowledge access and discovery. Combining this with geotemporal and social networking analytics is the next stage of business intelligence. In this presentation, we will discuss advances with geotemporal reasoning capabilities in RDF and query techniques that include space, time and objects of interest.

Michael Wessel, Dr., Racer Systems, Germany

- 1700-1730 Semantic annotation for web services and their relevance to environmental models
- Semantic annotations of services play a key role in automating tasks such as service discovery, selection, composition or mediation. In this context, this presentation will give an overview of existing top-down and bottom-up approaches to semantic annotation for web services, together with examples of service annotations in the environmental domain. Furthermore, this talk will introduce the notion of environmental Models-as-a-Service (MaaS) and will exemplify its applicability in the area of risk management and decision support for landslide and oil spill situations.
- Dumitru Roman, Senior Researcher, Semantic Technologies Institute (STI)/
University of Innsbruck, Austria
- 1730-1800 Systems interoperability through use of semantic technologies
- The talk will give an overview of the major challenges related to system interoperability in general and the specific issues related to interoperability on the semantic level. Examples on solution approaches based on use of semantic technology from current European projects will be given.
- Svein Johnsen, Research Scientist, SINTEF
Arne Jørgen Berre, Chief Scientist, SINTEF
- 1800 Summing up the day
- Jon Atle Gulla, Professor, NTNU
- 1900 Aperitif
- 1930 Dinner

CONFERENCE PROGRAMME WEDNESDAY 20 MAY

Session 4: Interoperability and information quality

Chair: Tor Arne Irgens, Commander Senior Grade, Norwegian Defence

One key motivation for semantic techniques is to contribute to increased quality of information. Traditionally information quality has been linked to information standards, like ISO 9000, while semantic technologies can contribute to information quality by supporting system interoperability, thereby diminishing important sources of error in information infrastructures. In this session issues related to interoperability and quality are addressed with an eye to challenges within defence and public sectors.

0800-0830 Will ISO 9000 be enough to ensure semantic quality?

About 1 million organisations worldwide have gained acceptance to ISO 9001, Quality Management Systems Requirements, since 1987. This is a tremendous success judged by the initial objectives. First ambition was to establish a common passport to trade. Today we are asking “Continuous Improvement”, there are quality policies referring to ultimatums like: “Zero Defects”, “Just in Time”, “Satisfaction Guaranteed”. This contribution will discuss what expectations to communicate to the market and what organisations typically produce of information to realise expectations. In short, what quality of information do we need to trust a company, quality-wise?

Knut Anderssen, Dr. Ing., DNV

0830-0900 Information management for interoperability in European air traffic control

The European air traffic control center, EuroControl, has established an architectural framework based on enterprise architecture inspired by DODAF/MODAF/NAF as a basis for the future development of networked European air traffic controls. The talk will present the information management and service architecture approach to cross – European interoperability for this. The architecture is being developed further in the ongoing SESAR project, with partners from the different European countries involved.

Ulf Larsson, Enterprise Architect, National air traffic center (Luftfartsverket), Sweden

0900-0930

Semantic MyPage

MyPage is an award-winning portal accessible on norway.no, that brings public service offerings together in a citizen's own customized page and which thus serves as a tool to find the services needed without any previous knowledge of who is responsible. "Semantic MyPage" is a concept developed in a Master Thesis by Kjetil Helberg and Steinar Skagemo, which enhances the functionality of the MyPage-portal using semantic technologies.

Kjetil Helberg, Senior Adviser, The Norwegian Post and Telecom. Authority
Steinar Skagemo, Adviser, The Agency for Public Management and eGovernment

0930-1000

Best practices for archive interoperability using semantic standards

The talk presents an approach investigated in the research project SESAM4 to lower the threshold for using semantic technology to attain interoperability on a global scale. The presentation will give you insight into which important issues you will have to face when applying semantic technology in your organisation.

Robert H. P. Engels, Dr., ESIS Norge and Western Norway Research Institute

1000-1030

Coffee break

Session 5: IT architecture for networked organizations

Chair: Arne Jørgen Berre, Chief Scientist, SINTEF

- 1030-1100 Supporting intelligent and automated integrated operations with agent technologies in a services architecture
- Complex industrial environments require interoperability between various technologies. Service Oriented Architectures (SOA) provide proven mechanisms and practices. Extending SOA to include use of semantic technologies like semantic web services and agents enables more flexible and resilient solutions supporting integrated operations and operational planning processes.
- Einar Landre, Specialist, StatoilHydro
- 1100-1130 SERES metadata repository – Now! – and long term goals
- The Brønnøysund Register Centre is deploying a metadata repository for the SERES semantic registry. The metadata repository will cover creation, structuring and governance of information that supports collaboration between governmental bodies, government and industry, and government and the public. It will cover semantics, structure and implementation aspects of messages and forms.
- David Norheim, Principal Engineer, Computas
Geir Jevne, Group Leader, DNV/SERES
- 1130-1200 IT architecture for supporting semantic interoperability through use of semantic annotations
- The FUSION and EMPOWER projects have developed an IT architecture for the support of semantic interoperability for information systems, through the use of OWL-based ontologies and use of SAWSDL (Semantic Annotation of WSDL and XML) for semantic annotations from existing services to relevant ontologies. The principal architecture and the support for semantic interoperability will be illustrated through an example.
- Stelios Pantelopoulos, Head of European Projects Department, Singular Logic, Greece

1200-1230 Semantic methods for the preservation and interpretation of information over time

Presentation of semantic methods and technologies used to preserve and interpret long term master data. An online pilot is being used to improve both usage of master data and the information governance. The pilot is a part of the Longrec case at Brønnøysund Register Centre.

Per Myrseth, Principal Researcher, DNV Research & innovation

1230-1330 Lunch

Session 6: Semantic technology for IO Generation 2

Chair: Arild Waaler, Professor, University of Oslo

Integrated operations is rapidly evolving, and OLF foresees a future Integrated Operations Generation 2 (IO G2) characterized by more intelligent and more automated operations than current IO, as well as much closer integration of operators, vendors and service companies. IO G2 will offer rich opportunities for advanced application of semantic technology. In this session we will present early studies and pilot projects exploring those opportunities, all related to the ongoing joint industry project Integrated Operations in the High North (IOHN).

1330-1400 Best practices in collaborative ontology engineering

IOHN will be facing the challenge of extending ISO 15926 in different directions where several distributed domain experts contribute their knowledge. Rather similar challenges are currently addressed in the German lighthouse research project THESEUS/TEXO which brings together experts in the field of the internet of services. A modular approach to ontology construction is required, where domain experts carry the main responsibility for their corresponding ontology module supported by a collaboration server. Governance methods, modelling guidelines, and best practices are applied to avoid inconsistencies and to arrive at superior design. We report on the findings of the THESEUS/TEXO project.

Daniel Oberle, Senior Researcher, SAP Research, CEC Karlsruhe, Germany

1400-1430 Applying ISO 15926 to drilling control systems

What is the value of implementing ISO 15926? What benefits can we expect from this, apart from just referencing a standardized vocabulary? This talk addresses how the ISO 15926 standard can ease integration and communication of information, illustrated by its use in the drilling and completion pilot of IOHN.

Kari Anne Haaland Thorsen, Post Doctor, University of Stavanger

1430-1500

Model-driven integration architecture for IO G2

An industrial framework facilitating the connection of real time data across oil and gas enterprises through the implementation of a managed and standards based reference semantic model, supporting condition monitoring, production optimization and real time visualization, complying with the OLF reference architecture for IO G2.

Frode Myren, Executive IT Architect, IBM
Udo Pletat, Dr., Senior Certified IT Specialist, IBM

1500-1530

Using semantic technology to represent standards for operations & maintenance

IBM's Reference Semantic Model (RSM), a core component of new systems designed for operations & maintenance, has recently been aligned with ISO 15926 on two levels: basic ontological notions involve installation structure and measurements, while equipment typing involves integration with the POSC Caesar Reference Data Library (RDL). Benefits to integration using this framework will be discussed. We will also address how semantics can help lifting existing XML standards to more exchange-friendly representations.

Johan Wilhelm Klüwer, Principal Specialist, DNV Energy

1530

Summing up

Thore Langeland, Manager IO, OLF



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SPEAKERS

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Guiseppe de Giacomo, University of Rome, Italy
Arne Jørgen Berre, SINTEF
Dima Panfilenko, DFKI, Germany
Richard Sagii, StatoilHydro
Thomas Baker, Kompetenzzentrum Interoperable Metadaten (KIM), Germany
Rich Gore, Cisco IT, USA
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Kristian Bergem, Agency for Public Management and eGovernment
Emilio Núñez, University of Texas at Austin, USA
Jean-Francois Rainaud, Institut Francais du Pétrole, France
Dominique Gabioud, University of Applied Sciences, Western Switzerland
Johanna Völker, University of Karlsruhe, Germany
Michael Wessel, Racer Systems, Germany
Dumitru Roman, Semantic Technologies Inst. (STI)/University Of Innsbruck, Austria
Svein Johnsen, SINTEF
Knut Anderssen, DNV
Ulf Larsson, National air traffic center, Sweden
Kjetil Helberg, The Norwegian Post and Telecommunications Authority
Steinar Skagemo, The Agency for Public Management and eGovernment
Robert H. P. Engels, ESIS Norge and Western Norway Research Institute
Einar Landre, StatoilHydro
David Norheim, Computas
Geir Jevne, DNV/SERES
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