



# The Semantic Technology Institute International

## Mission, Objectives, and Organization

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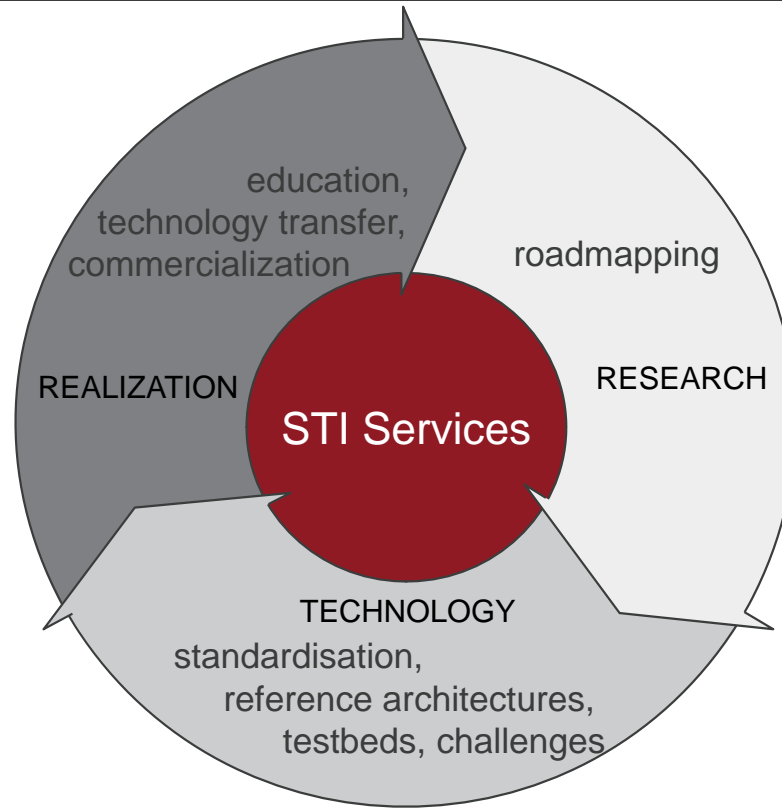
- Mission and Status
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- Future Challenges
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## Overview



- The mission of **Semantic Technology Institute International** is to establish **semantics** as a core pillar of modern computer science
- STI is an **association** of interested academic, industrial and governmental institutes.
- STI provides **services** to facilitate **research, education, and commercialization** activities around semantic technologies beyond the boundaries of individual institutions or projects

# The STI Services



## History and Status



- Founded in April 2007
- Legal status:  
non-profit association (registered in Austria)
- Key Personnel
  - Dipl. Ing. Alexander Wahler (CEO)
  - Univ.-Prof. Dr. Dieter Fensel (President)
- Members (March 2008): 27
- Website: [www.sti2.org](http://www.sti2.org)
- Location: Amerlingstrasse 19/35  
A-1060 Vienna, Austria



# Semantic Technologies

[www.sti2.org](http://www.sti2.org)

## What are Semantic Technologies?



- Semantic Technologies are about
  - **Formal and meaningful description** of data, protocols, and processes
  - **Ontologies** as explicit and shared knowledge models
- Benefits
  - **Meaning-preserving** information processing
  - Handling of **Heterogeneities**
  - Facilitate **Interoperability** and **Automation**
- Roots in Artificial Intelligence research
- recent research and developments around the Semantic Web

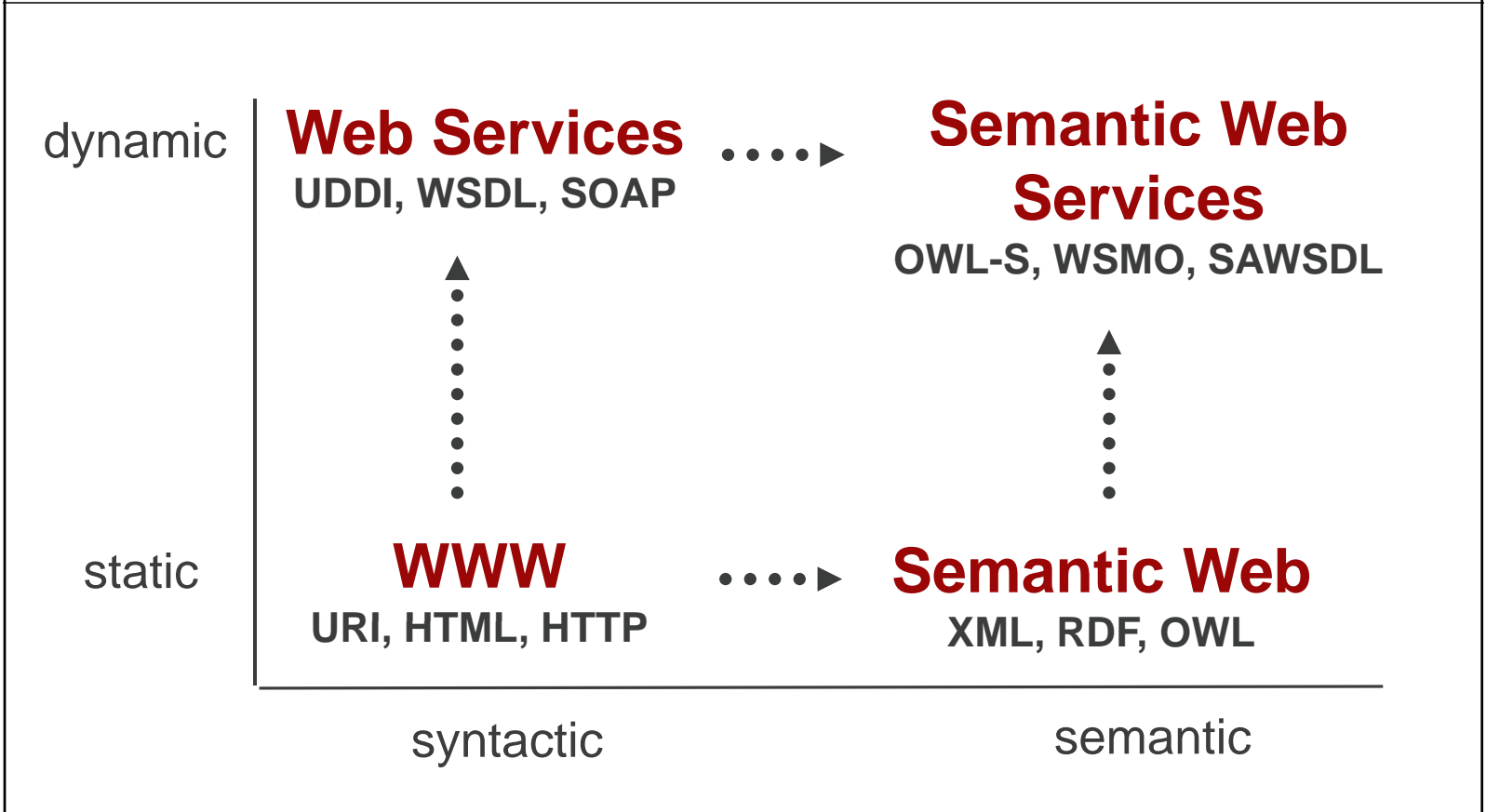
## Role in Future IT



- Semantic Technologies will become a pillar of future IT Systems in order to facilitate
  - **Meaning-preserving** information processing
  - **Interoperability** between systems and organizations
  - Higher degree of **Automation**
- Suitable technical solutions need to properly deal with the properties of Web-based applications
  - **Openness**
  - **Heterogeneity**
  - **Distributedness**
  - **Scalability**



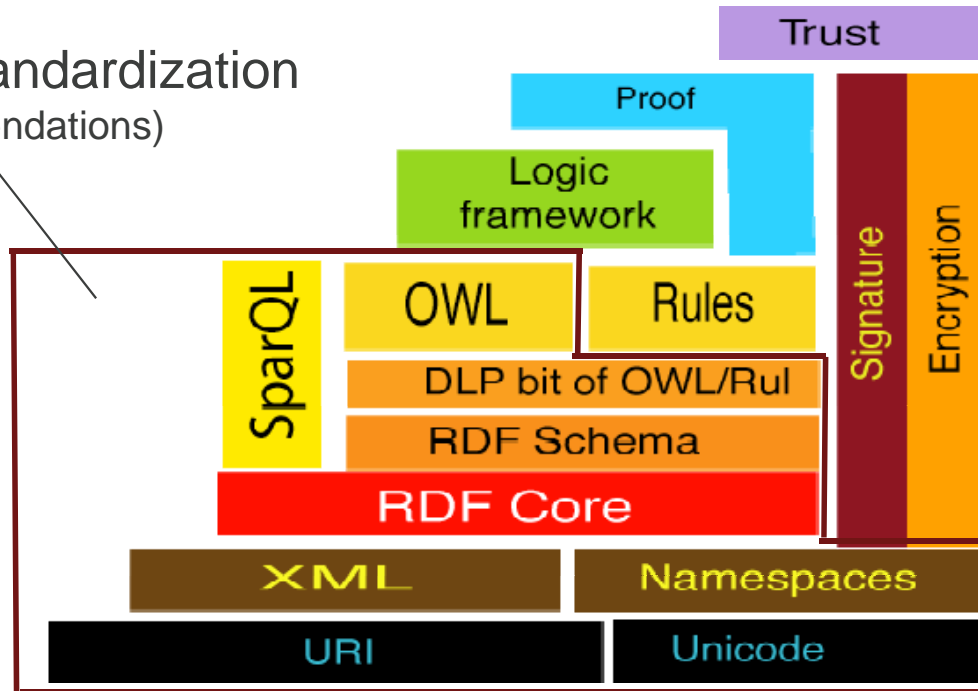
# Recent Developments



# Semantic Web Layer Cake



Status of Standardization  
(W3C Recommendations)



# Semantic Web Technologies



- **Ontology Management**

- Protégé ([protege.stanford.edu](http://protege.stanford.edu))
- OntoStudio ([www.ontoprise.de](http://www.ontoprise.de))
- WSMO Studio ([www.wsmostudio.org](http://www.wsmostudio.org))
- Altova SemanticWorks® ([www.altova.com](http://www.altova.com))
- IBM Ontology IDE ([www.alphaworks.ibm.com](http://www.alphaworks.ibm.com))
- WSMT ([wsmt.sourceforge.net](http://wsmt.sourceforge.net))

- **Repositories**

- Sesame ([www.openrdf.org](http://www.openrdf.org))
- Oracle 11g RDF database ([www.oracle.com](http://www.oracle.com))
- Jena (HP Labs) ([jena.sourceforge.net](http://jena.sourceforge.net))
- AllegroGraph ([agraph.franz.com](http://agraph.franz.com))
- OWLIM Semantic Repository ([www.ontotext.com/owlim](http://www.ontotext.com/owlim))
- SPARQL engines ([esw.w3.org/topic/SparqlImplementations](http://esw.w3.org/topic/SparqlImplementations))
- YARS ([sw.deri.org/2004/06/yars/](http://sw.deri.org/2004/06/yars/))

- **Reasoning Engines**

- Racer, FaCT, Pellet (OWL-DL) ([ontoworld.org/wiki/Category:Reasoner](http://ontoworld.org/wiki/Category:Reasoner))
- Flora 2 (F-Logic) ([flora.sourceforge.net](http://flora.sourceforge.net))
- IRIS (WSML) ([iris-reasoner.org](http://iris-reasoner.org))
- KAON2 (OWL-DL, WSML) ([kaon2.semanticweb.org](http://kaon2.semanticweb.org))

## Web 2.0



- **Web 2.0 is**
  - interactive – user-driven – collaborative
  - From **C**onsumers to **P**rosumers on the Web
  - New **T**echnologies: Wikis, Blogs, Tagging
- **Meta-data created by users**



## Semantic Web Services

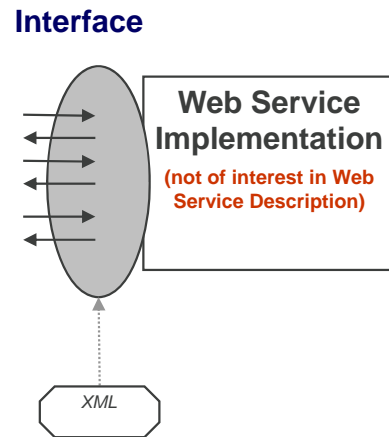


- **Aim & Approach**  
**automate the Web Service Usage Cycle** in SOA Systems by
  1. **rich, formal annotation of Web Services**
  2. **inference-based techniques for automated discovery, composition, mediation, execution of Web Services**
- Overcome **deficiencies** of initial Web service technology stack (WSDL, SOAP, UDDI) that limits the detection and integration of Web services by clients to **manual inspection**
- Integration with the Semantic Web
  - Using **ontologies** as underlying knowledge models
  - Enable **semantic interoperability**

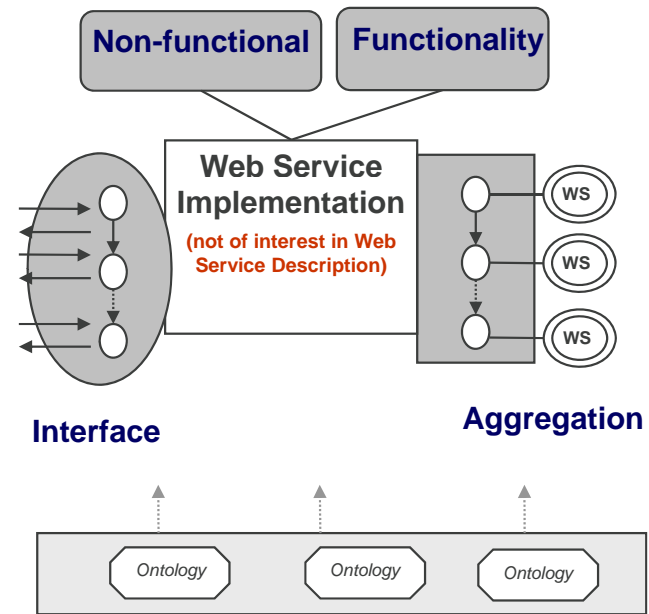
# SWS Approach



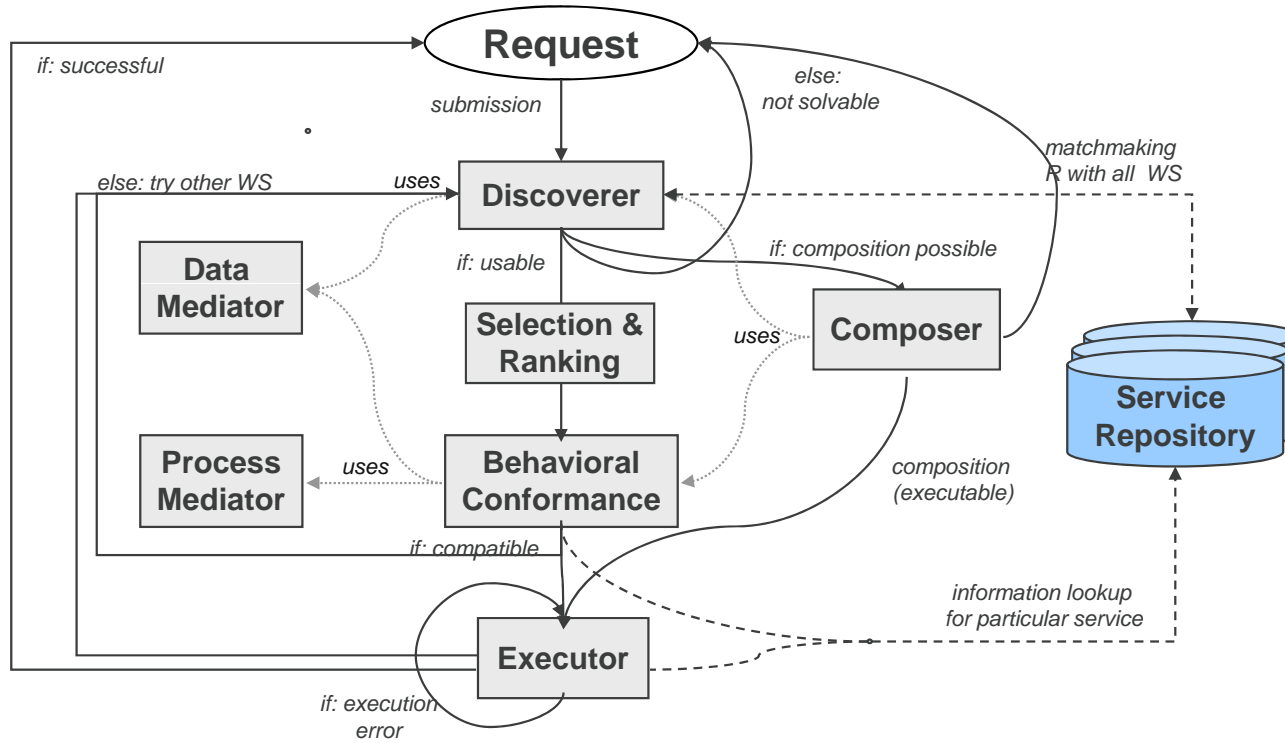
a) Web Service Description Structure



b) Semantic Web Service Description Structure



# SWS Techniques



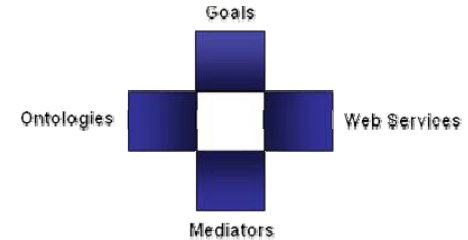
# SWS Frameworks



Ease of Provision and Usage
Degree of Automation & Interoperability

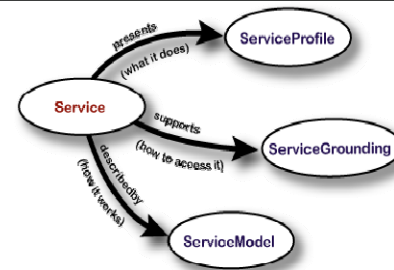
## WSMO

*comprehensive framework for Semantic SOA*



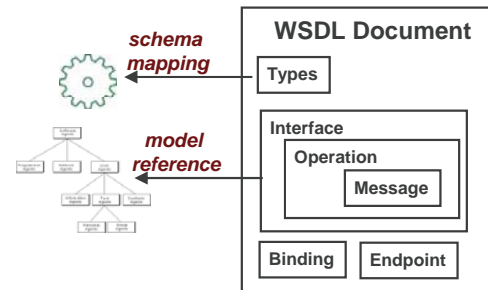
## OWL-S

*upper-level ontology for describing Web services*



## SAWSDL / WSDL-S

*semantic annotation of WSDL descriptions*







# **Future Challenges and the Role of STI International**

[www.sti2.org](http://www.sti2.org)

## State of Affairs



- There is a significant amount of research results and technology developments on semantic technologies
- ... **BUT:**
  - Still many open research issues
  - Mostly academic solutions (not ready for the market)
  - Too less commercial adaptation
  - Too few killer applications
  - ...
- Thus, it is necessary to
  - **coordinate** and **integrate** future research
  - **Standardize** technology developments
  - force **industrial adaptation** and exploitation

**=> *STI International addresses these challenges***

## Challenge 1: Future Research



- **Future Research Issues include**
  - Scalable reasoning techniques for the Semantic Web
  - Integrated ontology engineering technologies
  - Knowledge acquisition and automated semantic annotation of data and services
  - Scalable and workable SWS technologies
  - ...
- **STI International supports this by**
  - Defining common **research roadmaps**
  - Coordinating **cross-project working groups**

## Challenge 2: Technology Development



- **The Development of Semantic Technologies requires**
  - Integrated, adoptable, and extensible software architectures
  - Use case scenarios for testing, demonstration, and evaluation
  - Platforms for demonstrating benefits to outer world
  - Legal framework for IPRs and usage by third parties
- **STI International supports this by**
  - Providing an **open-source integrated reference architecture**
  - Defining **test-beds and challenges** for testing, demonstration, evaluation, and comparison of technology developments

## Challenge 3: Standardization & Commercialization



- **Critical Success Factors are**
  - **Standardization of Technologies** by renowned standardization bodies (W3C, OASIS, OMG)
    - The work in standardization bodies is usually cumbersome
    - => *good preparation is required*
  - **Commercial Adaptation** of semantic technologies
    - => *requires ready-to-market solutions and industrial cooperation*
- **STI International supports this by**
  - **Coordinating standardization** activities among members
  - Coordinating **pre-standardization work**
  - **Establishing a network** and **coordinate cooperation projects** with the international industry (IT vendors and Users)

## Challenge 4: Education & Dissemination



- **The thorough adaptation of Semantic Technologies requires**
  - Extensive dissemination in research, industry, and society
  - Systematic education of students, researchers, and practitioners
  - Training and educational services by experts
- **STI International supports this by**
  - Coordinating **dissemination and marketing activities**
  - Providing **educational services for students and researchers** (summer schools, tutorials, etc.)
  - Providing **education and training services** for industry and other interested parties (tutorials, training workshops, etc.)
  - Coordinating **academic education** among its members
  - Coordinating **exchange programs** for students and researchers



# **STI International**

***– Organization, Services, Members –***

[www.sti2.org](http://www.sti2.org)

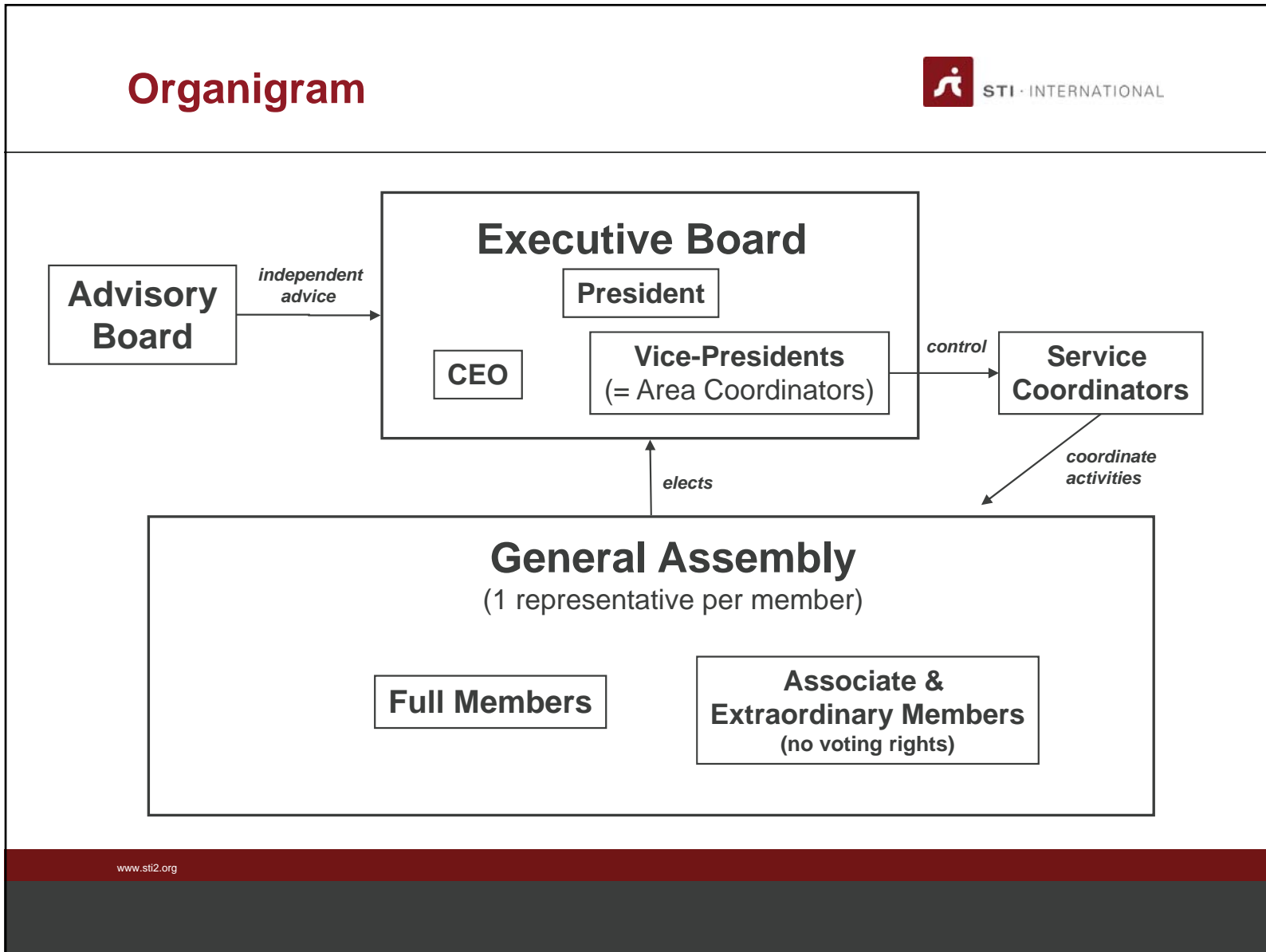
## Overview



- **Aim: a central institution for coordinating R&D & on Semantic Technologies in Europe and beyond**
  - Support successful & enduring development and adaption
  - Coordinate research, development, dissemination, standardization
  - Supportive services for members
- **STI is a non-profit organization run by its members**
  - **General Assembly:** elects President and Board Members
  - **Members:** propose new activities, voting rights
  - **Executive Board:** controls the business
  - **Advisory Board:** independent advice
  - **CEO:** responsible for the operational business
- **Members (March 2008):**
  - Full members: 22
  - Associate members: 4
  - Members of Honor: 1



# Organigram



## The Executive Board



**Dr. Michael Brodie**  
Chair Advisory  
Board



**Dr. John Davies**  
Vice President  
Realization



**Univ.-Prof. Dr. Dieter Fensel**  
Vice President  
Strategic Affairs



**Prof. Dr. John Domingue**  
President



**Prof. Dr. Guus Schreiber**  
Vice President  
Technology



**Prof. Dr. Rudi Studer**  
Vice President  
Research



**Alexander Wahler**  
CEO



**Univ.-Prof. Hannes Werthner**  
Vice President  
Members

## The Advisory Board



**Dr. Michael Brodie**  
Verizon, US  
Vice President  
Chair Advisory Board



**Dr. Richard Benjamins**  
Telefónica R+D  
Advisory Board Member



**Dr. Mark Greaves**  
Vulcan Inc., US  
Advisory Board Member

## The Extended Board



**Witold Abramowicz**  
The Poznan University  
of Economics, PL  
Strategic Development &  
Internationalisation  
Service Coordinator



**Prof. Dr. Fabio Ciravegna**  
University of Sheffield, UK  
Roadmaps  
Service Coordinator



**Oscar Corcho**  
Universidad Politécnica de  
Madrid, ES  
Testbeds and Challenges  
Service Coordinator



**Mathieu Daquin**  
Knowledge Media Institute,  
Open University, UK  
Realisation  
Service Coordinator



**Dr. Emanuele Della Valle**  
CEFRIEL, IT  
Testbeds and Challenges  
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**Prof. Dr. Asunción  
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Testbeds and Challenges  
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Future Internet Initiative Task Force  
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**Peter Mika**  
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Roadmaps  
Service Coordinator



**Dr. Michal Zaremba**  
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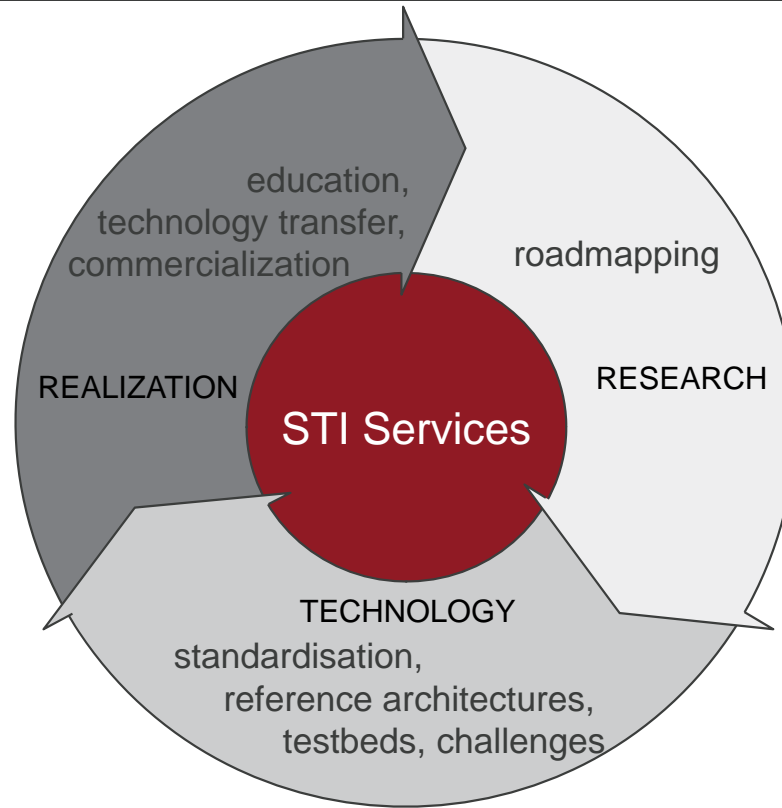
## STI Services



STI addresses the emerging challenges for the future research & development by:

- Definition of **Research Roadmaps**
- Common Strategy and Coordination for **Standardization**
- Provision of open-source **Reference Architectures**
- Provision of open **Test Beds** and **Challenges**
- Joint program for **Education** in semantic technologies
- Support & Coordination of **Industrial Commercialization**
- Coordination of **Cross-Project Working Groups**
- **Coordination & Auxiliary Services** for members and associated R&D projects

# The STI Service Cycle



## STI Research - Roadmapping



- STI International will create, maintain, and publish roadmaps as a means of planning and coordinating its activities towards the achievement of the mission.
- The service will focus on the five main areas of research in the field of semantic systems and services:
  - Ontologies and Ontology Engineering
  - Reasoning
  - Knowledge Acquisition and Sharing
  - Semantic Web Services
  - Social Networks



**Prof. Dr. Fabio Ciravegna**  
University of Sheffield, UK  
Service Coordinator



**Dr. Raphael Volz**  
Raphael Volz Innovation  
Consulting GmbH, DE  
Service Coordinator

## STI Technology – Standardization and Reference Architectures



- STI International will provide
  1. Support and coordination services for technology standardization
  2. Development of Reference Architectures for semantic technologies
- The aim is to
  - Establish a communication channel with W3C, OASIS and OMG
  - Provide a open, integrated, and extensible software architecture for semantic technology developments
  - Facilitating communication across the various projects and initiatives
  - Gaining leverage and impact by combining efforts



**Dr. Michal Zaremba**  
University of Innsbruck, AT  
Service Coordinator



**Barry Norton**  
Knowledge Media Institute  
Open University, UK  
Service Coordinator



## STI Technology – Testbeds and Challenges



- STI International will facilitate the joint development of open, globally distributed testbeds for developing, deploying and testing Semantic Web technologies and Semantic Web Services at global scale
- Challenges will offer participants the possibility to show the best of Semantic Web and Semantic Web Services technologies in order to identify promising approaches and to support relevant developments



**Prof- Dr. Asunción Gómez-Pérez**  
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Service Coordinator



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CEFRIEL, Politecnico di Milano, I  
Service Coordinator



**Oscar Corcho**  
Universidad Politécnica de Madrid, ES  
Service Coordinator



**Barry Norton**  
Knowledge Media Institute  
Open University, UK  
Architecture Service Coordinator

## STI Realization – Commercialization



- STI International will facilitate the commercial exploitation of R&D results with the aim of increasing business opportunities
- STI International performs, among others, the following commercialization activities:
  - Knowledge Capitalization Structure
  - Market surveillance
  - Comprehensive offer building for proving the interest of SWS and Semantic Web in general
  - International position strategy
  - Diffusion by consolidation of dissemination plans and activities



**Mathieu Daquin**  
Knowledge Media Institute,  
Open University, UK  
Coordinator

## STI Realization – Education



- STI International will provide educational activities in the field of semantic technologies for academia and industry
- The STI educational program includes:
  - Generation of high-quality training materials for specific target communities
  - Development and maintenance of training repositories and expert databases
  - Organization of different types of training and educational events
  - Provision of different types of training
  - Set-up of joint doctoral or exchange/internship programs between research institutions and between researchers and industry and operational support for their implementation.



**Dr. Elena Simperl**  
University of Innsbruck, AT  
Service Coordinator

## Membership Regulations



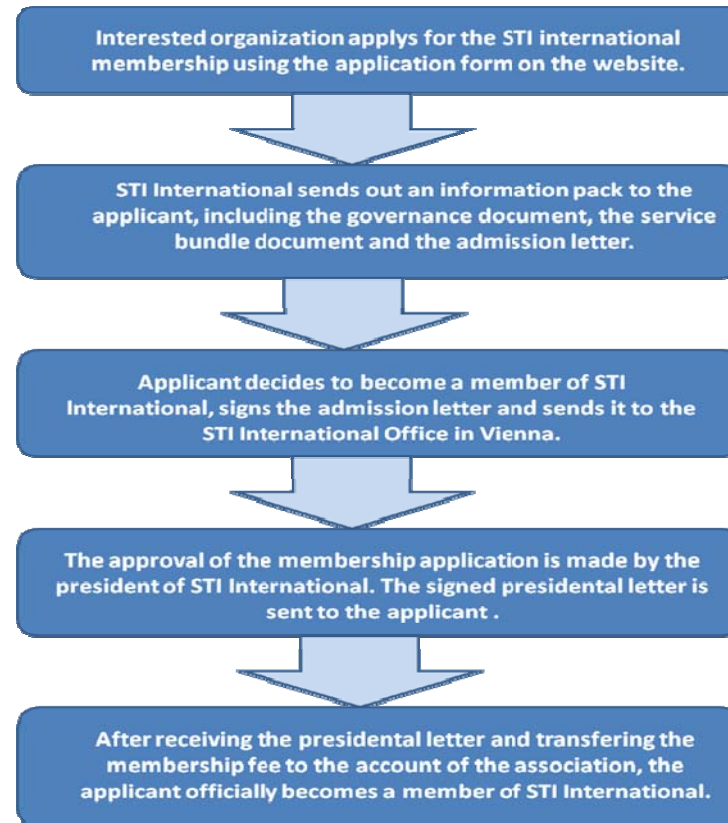
- STI International invites organizations from all over the world to become a contributing member
- 3 Types of Membership:
  - 1. Full Members**
    - Access to STI Services (free of charge)
    - Full voting rights
    - Creation of new working groups & initiate other activities
    - Full promotional benefits
  - 2. Associate Members**
    - Limited access to STI Services and Working Groups (free of charge)
    - No voting rights
    - Limited promotional benefits
  - 3. Extraordinary Members**
    - Member of Honor (by invitation)
    - Sponsoring Member
    - No voting rights

## Membership Fees



Membership Type	Annual Fees
<b>Full Membership</b>	<p><b>For-Profit Organizations</b></p> <p><i>Annual Turnover                  Membership Fees (in €)</i></p> <p>less than €2 million                  2.000,-</p> <p>more than €2 million                  5.000,-</p> <p><b>Non-Profit Organizations</b></p> <p><i>Country (accord. to WB)          Membership Fees (in €)</i></p> <p>high income country                  3.000,-</p> <p>low/middle income country          1.000,-</p>
	<p><b>Associate Membership</b>          10% of full membership fee</p>
<p><b>Sponsoring Membership</b></p>	<p>sponsoring is agreed on a case-by-case basis with the applicants</p>
<p><b>Member of Honor</b></p>	<p>free</p>

## Membership Application



# Full Members (November, 2008)



Total: 28

## Associate Members (November 2008)



seit 1558



Dr. Michael Brodie  
(Member of Honor)

Total: 11 + 1



## Contact Information



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