Semantic Evaluation at Large Scale Tutorial

Introduction to the SEALS Platform

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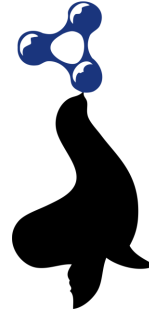Universidad Politécnica de Madrid, Spain

rgarcia@fi.upm.es

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- **Introduction**
- SEALS Platform
- SEALS Evaluation Services
- SEALS Evaluation Campaigns
- SEALS Community
- Conclusions

SEALS
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The SEALS Project

http://www.seals-project.eu/
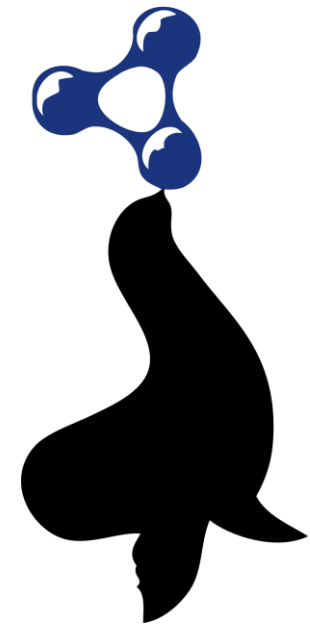
Project Coordinator:
Asunción Gómez Pérez
<asun@fi.upm.es>

EC contribution:
3.500.000 €

Duration:
June 2009-May 2012

Universidad Politécnica de Madrid, Spain (Coordinator)

University of Sheffield, UK

University of Mannheim, Germany

Forschungszentrum Informatik, Germany

University of Zurich, Switzerland

University of Innsbruck, Austria

STI International, Austria

Institut National de Recherche en
Informatique et en Automatique, France

Open University, UK

Oxford University, UK

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SEALS Outlook on Semantic Technology Evaluation
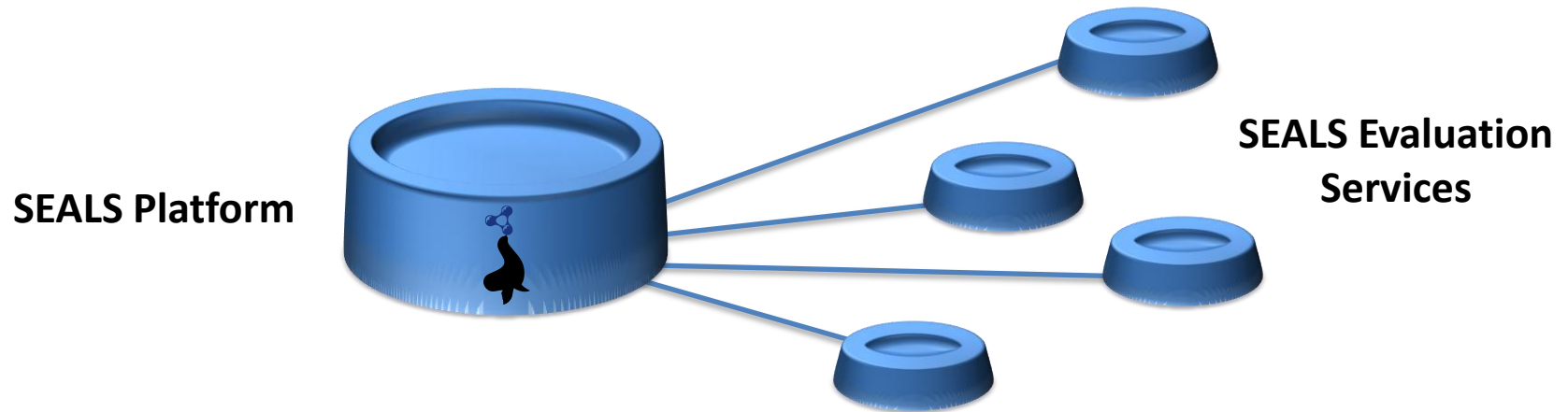
SEALS Platform
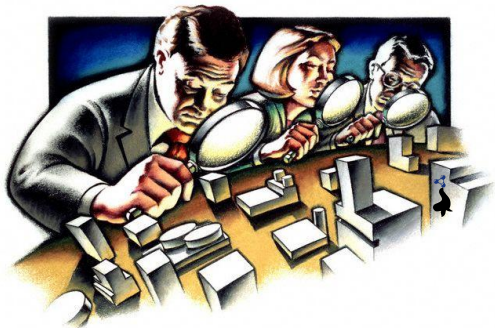
SEALS Evaluation Services

SEALS Evaluation Campaigns

SEALS Community

SEALS
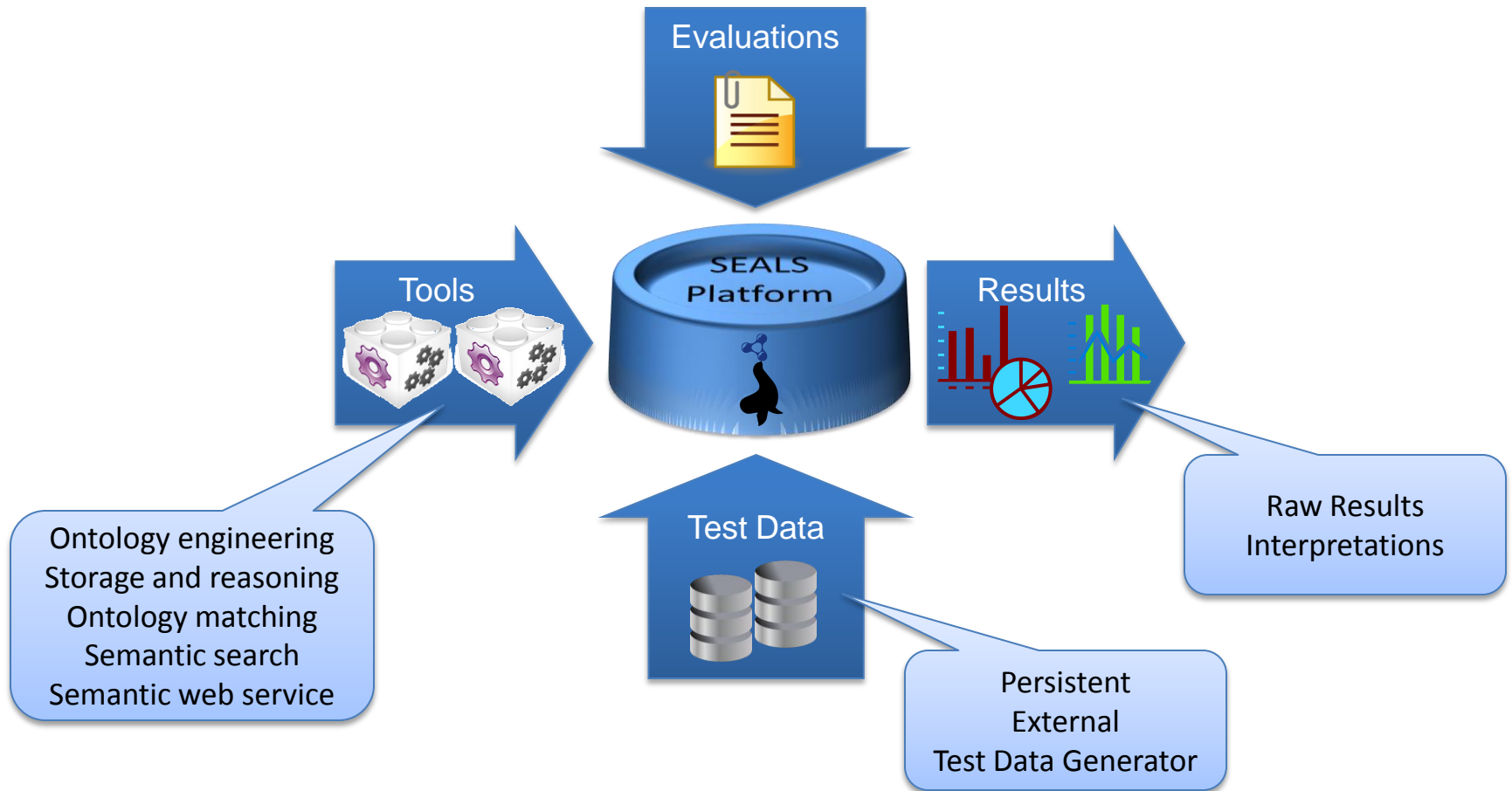Semantic Evaluation at Large Scale

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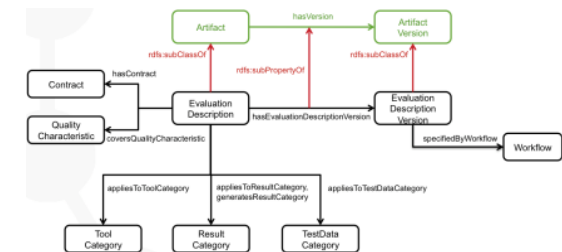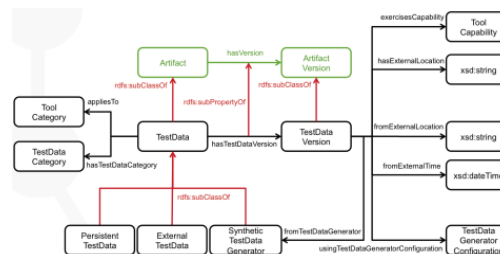Semantic Evaluation at Large Scale

The SEALS entities

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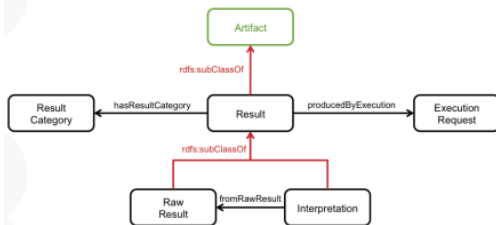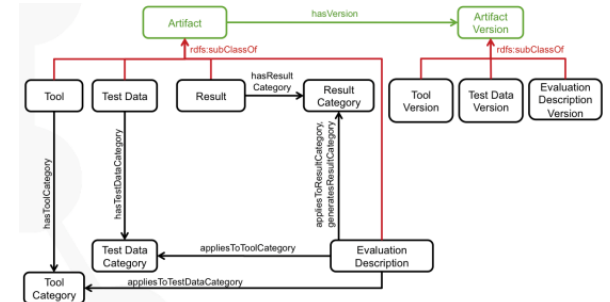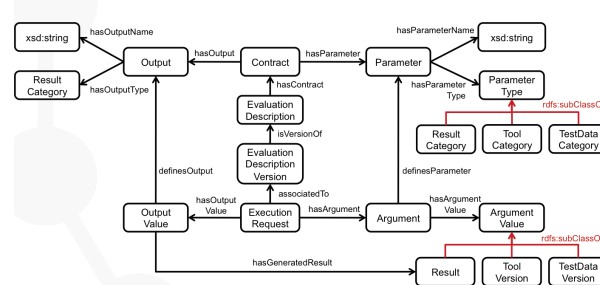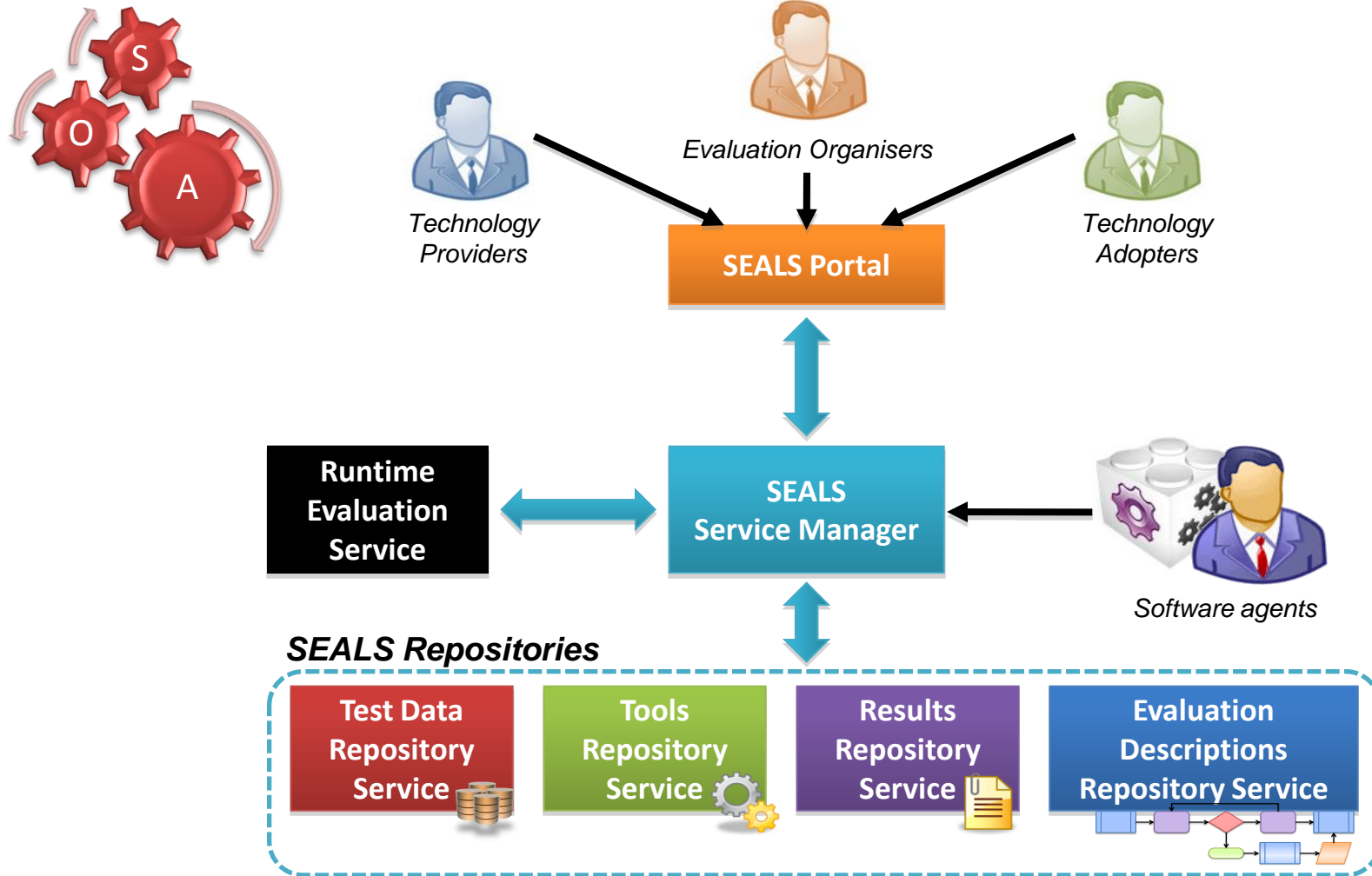
The SEALS ontologies

- Describe all the information needed to evaluate semantic technologies
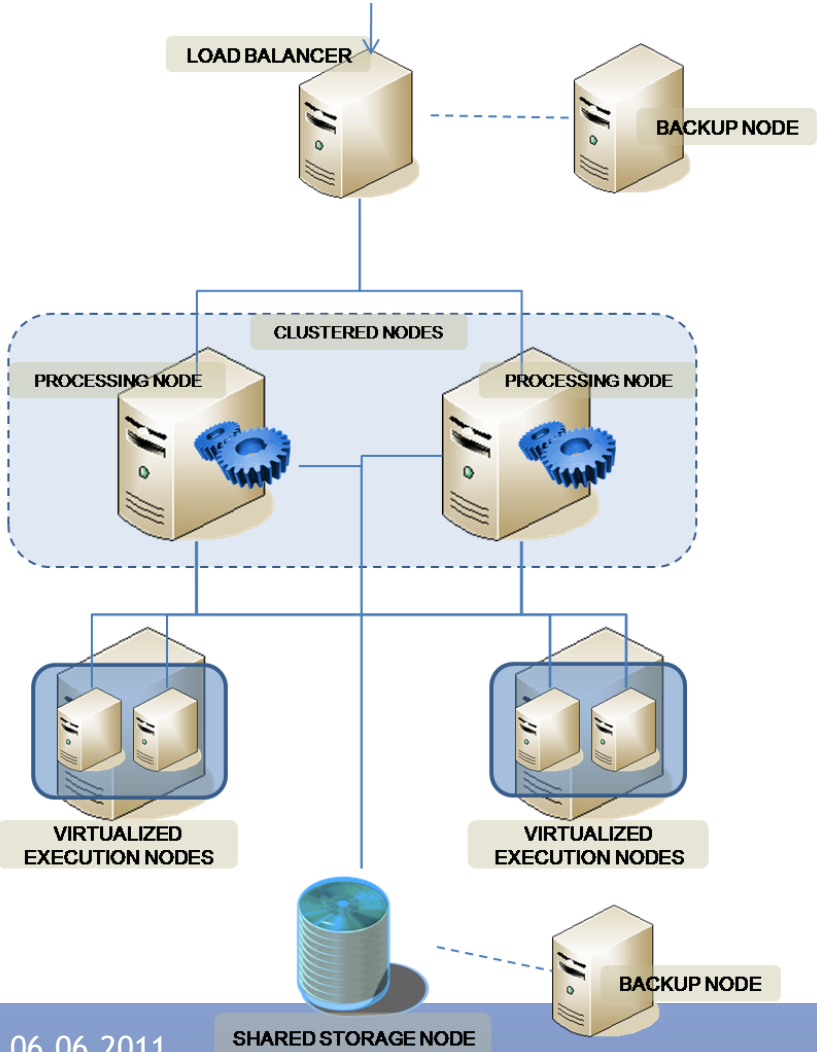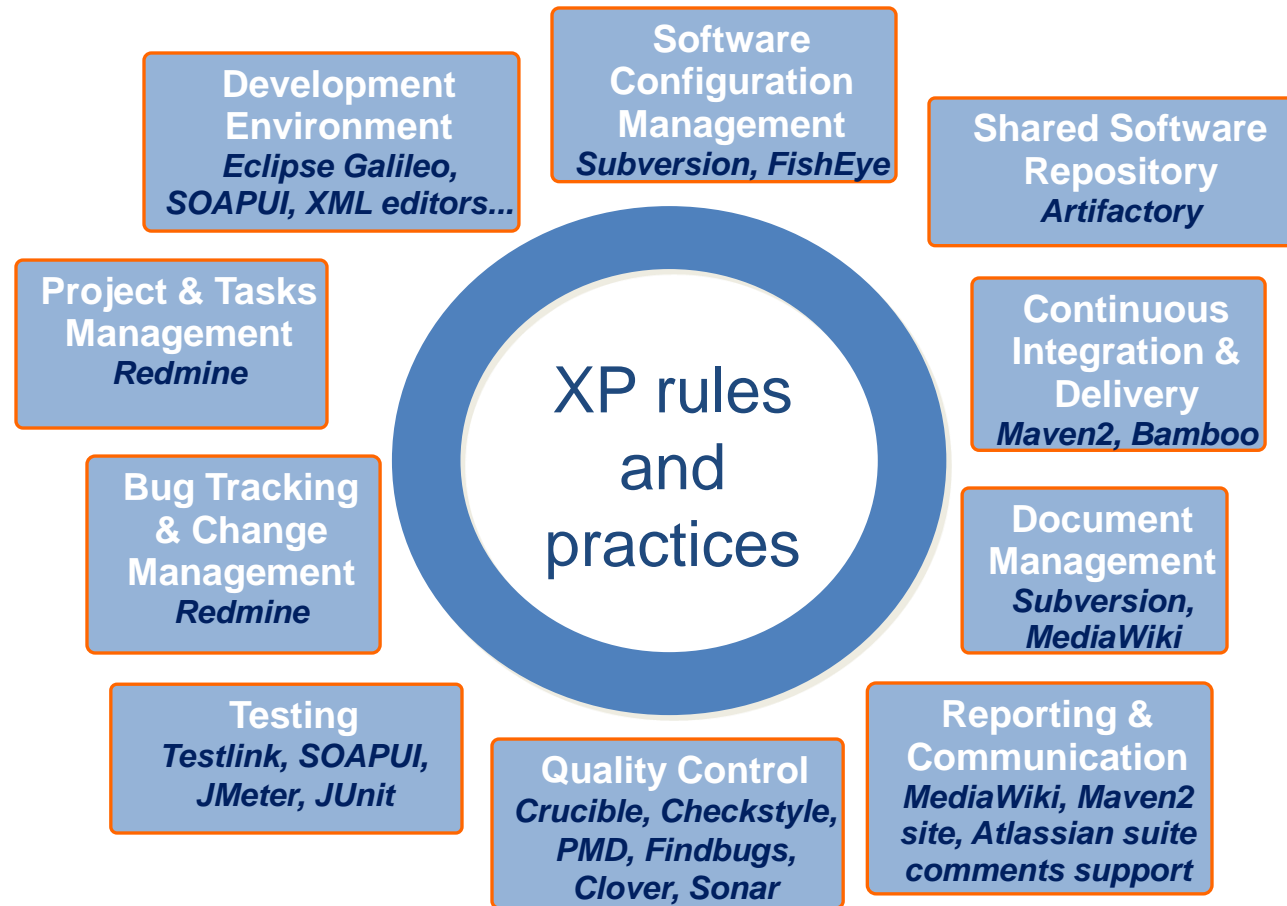- Reuse existing ontologies (e.g.,Dublin Core, FOAF, VCard)
  http://www.seals-project.eu/ontologies/

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SEALS Logical Architecture

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SEALS Technical Infrastructure

LOAD BALANCER

BACKUP NODE

CLUSTERED NODES

PROCESSING NODE

PROCESSING NODE

VIRTUALIZED
EXECUTION NODES

VIRTUALIZED
EXECUTION NODES

SHARED STORAGE NODE

BACKUP NODE

- 2 servers IBM x3550 M3
  - 2 Intel Quad Core E5506 2,13Ghz
  - 16GB RAM
  - 3 HDD SAS Hot Swap 600GB 10k
- 2 servers IBM x3550 M3
  - 2 Intel Quad Core E5506 2,13Ghz
  - 32GB RAM
  - 3 HDD SAS Hot Swap de 300GB 10k
- 2 servers
  - 2 Intel Quad Core E5506 2,13Ghz
  - 16GB RAM
  - 3 HDD SAS Hot Swap 300GB 10k
- 1 server
  - 2 Intel Xeon E5506 2,13GHz
  - 32GB RAM
  - 3 HDD SAS How Swap 1TB 7,2k
- IBM System Storage DS3400 Dual Controller
  - 10 HDD SAS IBM 600GB SL HS 15K
  - 5 HDD SAS 2TB Near Line 7,2k

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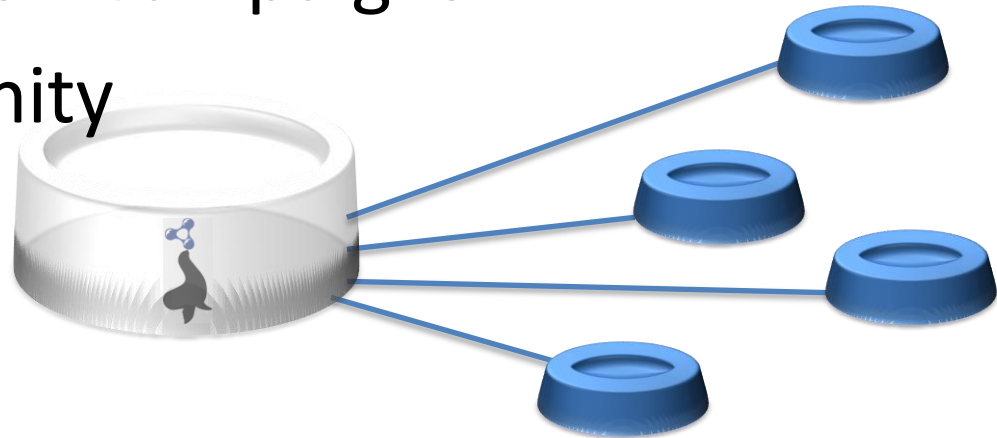
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Methodology and Infrastructure in SEALS development

- Open source
- Agile development
- Continuous integration process
- Sustainability
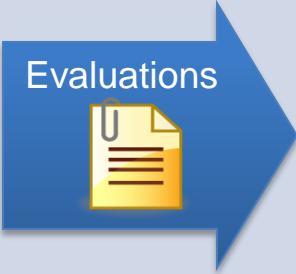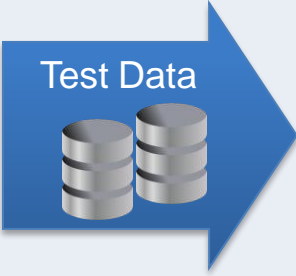- Releases planned every six months

Development Environment
Eclipse Galileo, SOAPUI, XML editors...

Software Configuration Management
Subversion, FishEye

Shared Software Repository
Artifactory

Project & Tasks Management
Redmine

Continuous Integration & Delivery
Maven2, Bamboo

Bug Tracking & Change Management
Redmine

XP rules and practices

Document Management
Subversion, MediaWiki

Testing
Testlink, SOAPUI, JMeter, JUnit

Quality Control
Crucible, Checkstyle, PMD, Findbugs, Clover, Sonar

Reporting & Communication
MediaWiki, Maven2 site, Atlassian suite comments support

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- SEALS Platform
- **SEALS Evaluation Services**
- SEALS Evaluation Campaigns
- SEALS Community
- Conclusions

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SEALS Evaluation Services

	Ontology engineering	Ontology reasoning	Ontology matching	Semantic search	Semantic web service
Evaluations	• Conformance • Interoperability • Scalability	• Classification • Class satisfiability • Ontology satisfiability • Entailment • Non-entailment	• Matching accuracy	• Search accuracy, efficiency (automated) • Usability, satisfaction (user-in-the-loop)	• SWS Discovery
Test Data	Conformance & interoperability: • RDF(S) • OWL Lite, DL and Full Scalability: • Real-world • LUBM	• Gardiner test suite • Wang et al. repository • Versions of GALEN • Ontologies from EU projects	• Benchmark test data • Anatomy test data • Conference test data	• EvoOnt test data (automated) • Mooney test data (user-in-the-loop)	• OWLS-TC 4.0 test data

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Using the SEALS Evaluation Services

- Currently requires a local deployment of the SEALS Platform

- In the future, these services will be available:

    – For community members through the SEALS Portal

    – For software agents through APIs

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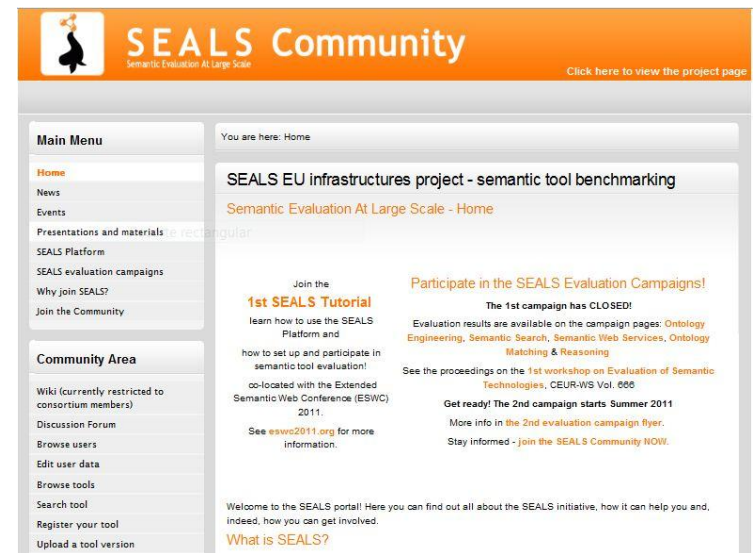
Inserting an evaluation
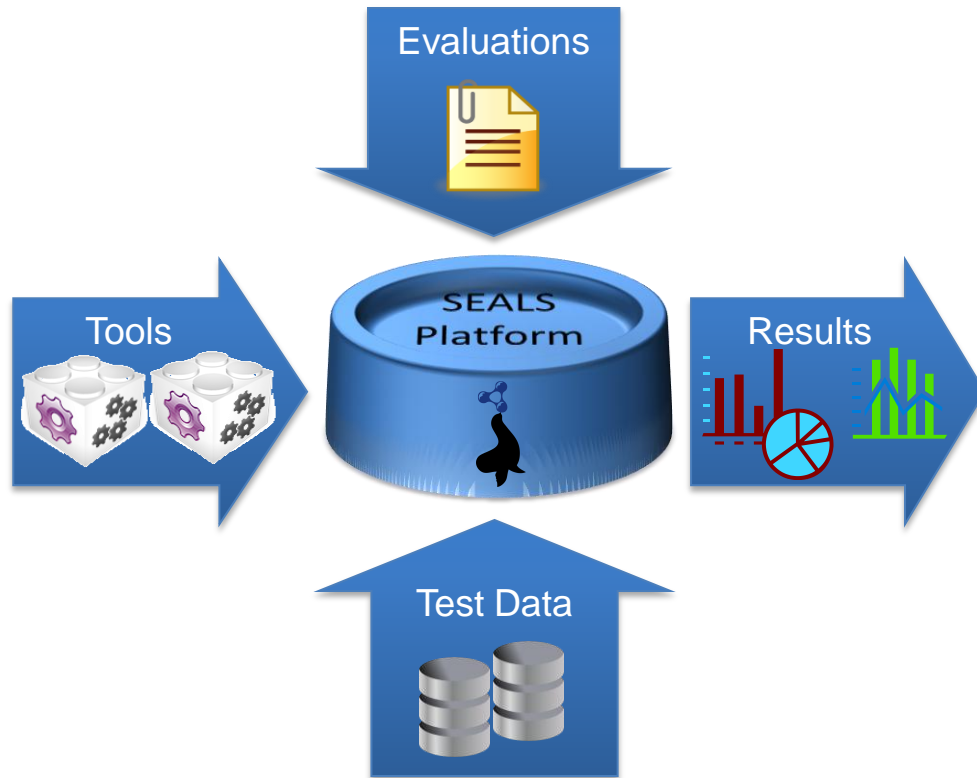
1. Implement:
- Evaluation workflow
- Tool plugins
- Custom services

2. Describe:
- Evaluation
- Tools
- Test Data
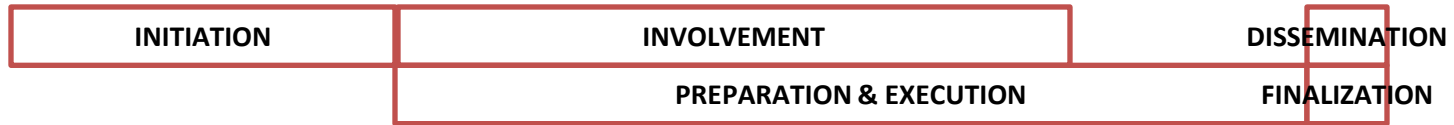- Raw Results
- Interpretations

3. Package:
- Evaluation
- Tools
- Test Data
- Raw Results
- Interpretations

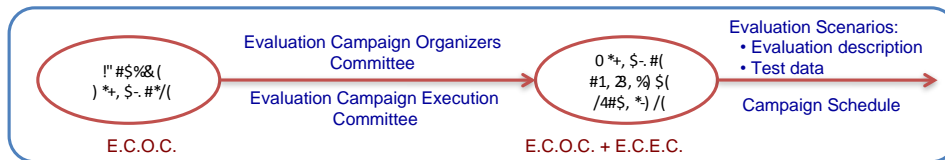**SEALS**
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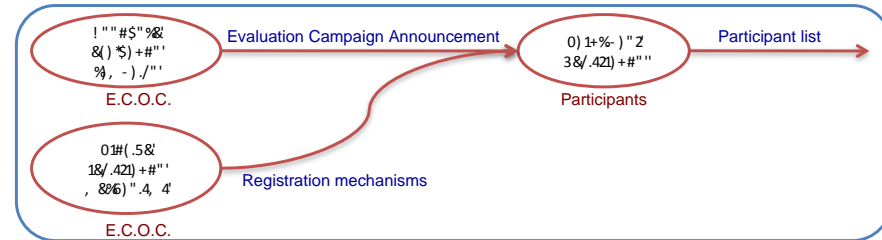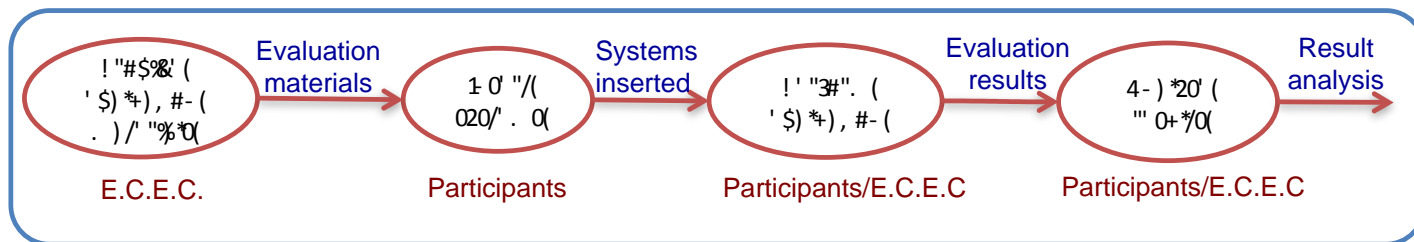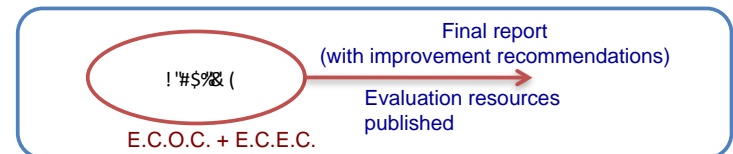Semantic Evaluation at Large Scale
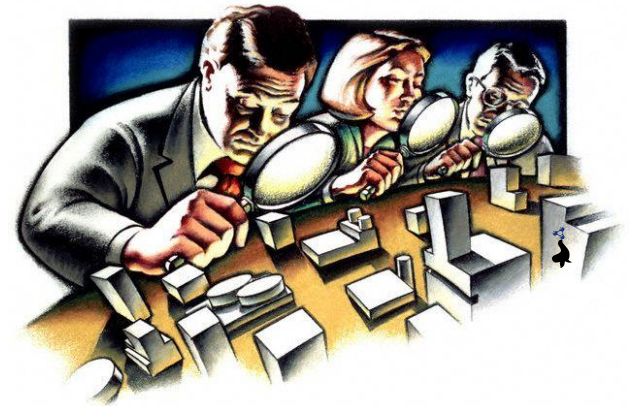
Evaluation Campaign Process

INITIATION	INVOLVEMENT	DISSEMINATION
	PREPARATION & EXECUTION	FINALIZATION

INITIATION

Evaluation Campaign Organizers Committee

Evaluation Campaign Execution Committee

E.C.O.C.

E.C.O.C. + E.C.E.C.

Evaluation Scenarios:
• Evaluation description
• Test data

Campaign Schedule

INVOLVEMENT

Evaluation Campaign Announcement

E.C.O.C.

Registration mechanisms

E.C.O.C.

Participants

Participant list

PREPARATION & EXECUTION

Evaluation materials

Systems inserted

Evaluation results

Result analysis

E.C.E.C.

Participants

Participants/E.C.E.C

Participants/E.C.E.C

DISSEMINATION

Feedback

Results published

E.C.O.C. + E.C.E.C. + Participants

E.C.O.C.+ E.C.E.C. + Participants

FINALIZATION

Final report
(with improvement recommendations)

Evaluation resources published

E.C.O.C. + E.C.E.C.

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1ˢᵗ Evaluation Campaign

Ontology Engineering Tools	Reasoning Tools	Ontology Matching Tools	Semantic Search Tools	Semantic Web Service Tools
OET Conformance 2010 Conformance **OET Interoperability 2010** Interoperability **OET Scalability 2010** Efficiency, scalability	**DLBS Classification 2010** **DLBS Class satisfiability 2010** **DLBS Ontology satisfiability 2010** **DLBS Logical entailment 2010**	**MT Benchmark 2010** Conformance, interoperability **MT Anatomy 2010** Conformance, interoperability **MT Conference 2010** Conformance, interoperability, alignment coherence	**SST Automated 2010** Search quality, performance, query expressiveness **SST User Usability 2010** Usability, query expressiveness	**SWS Tool Discovery Evaluation 2010** Retrieval performance **Affiliated campaigns:** **SWS Challenge 2010** **S3 (Semantic Service Selection) Contest 2010**: Performance
6 Participants	3 Participants	13 Participants	5 Participants	4 Participants

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29 Participating tools

Campaign	Tool	Provider	Country
Ontology engineering	Jena	HP Labs	UK
	Sesame	Aduna	Netherlands
	Protégé 4	University of Stanford	USA
	Protégé OWL	University of Stanford	USA
	NEON toolkit	NEON Foundation	Europe
	OWL API	University of Manchester	UK
Reasoning	HermiT	University of Oxford	UK
	jcel	Technischen Universitat Dresden	Germany
	FaCT++	University of Manchester	UK
Matching	AROMA	INRIA	France
	ASMOV	INFOTECH Soft	USA
	Aroma	Nantes University	France
	Falcon-AO	Southeast University	China
	Lily	Southeast University	China
	RiMOM	Tsinghua University	China
	Mapso	FZI	Germany
	CODI	University of Mannheim	Germany
	AgreeMaker	Advances in Computing Lab	USA
	Gerome*	RWTH Aachen	Germany
	Ef2Match	Nanyang Tec. University	China
Semantic search	K-Search	K-Now Ltd	UK
	Ginseng	University of Zurich	Switzerland
	NLP-Reduce	University of Zurich	Switzerland
	PowerAqua	KMi, Open University	UK
	Jena Arq	HP Labs, Talis	UK
Semantic web service	4 OWLS-MX variants	DFKI	Germany

8 countries

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1ˢᵗ Evaluation Campaign Results

- **Overview:**
  - The state of semantic technology today – Overview of the First SEALS Evaluation Campaigns

- **Details:**
  - SEALS D10.3 (ontology engineering)
  - SEALS D11.3 (reasoning)
  - SEALS D12.3 (ontology matching)
  - SEALS D13.3 (semantic search)
  - SEALS D14.3 (semantic web service)

The state of semantic technology today – Overview of the First SEALS Evaluation Campaigns

Raúl García-Castro, Mikalai Yatskevich, Cássia Trojahn dos Santos, Stuart N. Wrigley, Liliana Cabral, Lyndon Nixon and Ondřej Šváb-Zamazal

April 2011

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2ⁿᵈ Evaluation Campaign

| June 2011 | Sept 2011 | Jan 2012 | April 2012 | June 2012 |

Provide requirements

Comment on the evaluations and test data

Join the Evaluation Campaign!

Run your own evaluations

Definition of evaluations and test data

Announcement at ESWC 2011

Launch of 2ⁿᵈ Campaign

Results of 2ⁿᵈ Campaign

Results presented at ESWC 2012

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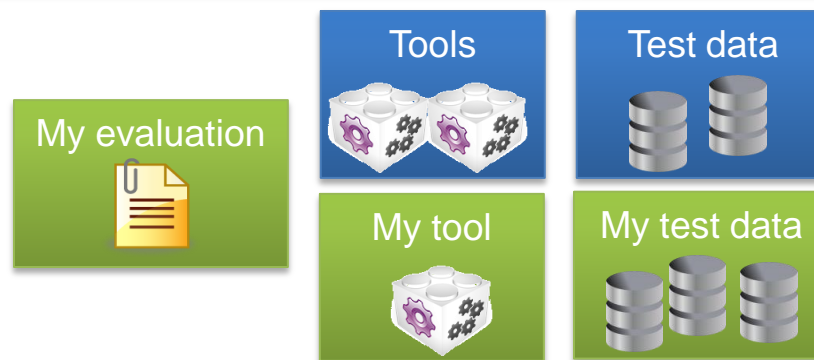- **SEALS Community**
- Conclusions

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Community services
http://www.seals-project.eu/

- Portal
- Blog
- Twitter
- Mailing lists

Dissemination services

Collaboration services

- Public wiki
- Forums
- Private wiki
- Private mailing lists

Community materials

- Whitepaper
- Deliverables
- Papers
- Tutorial

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Evaluation services

Execute evaluations

Evaluations

Tools

My tool

Test data

Results

My results

Update them

Evaluations

Tools

My test data

My results

Or define your own

My evaluation

Tools

Test data

My tool

My test data

My results

Exploit results
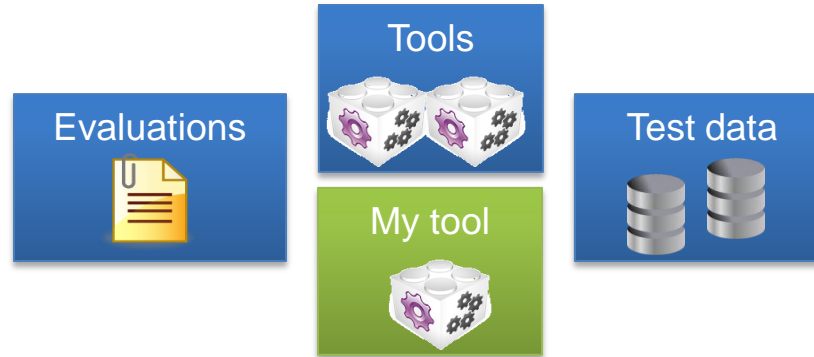
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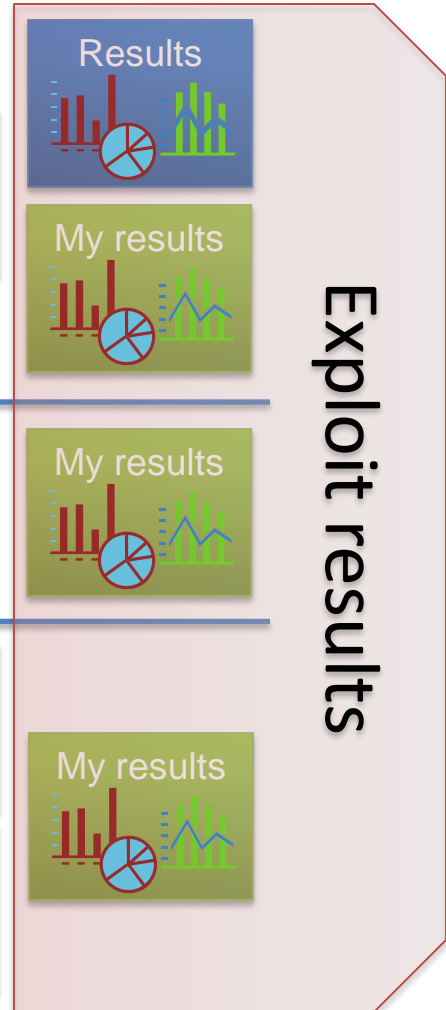
Participation in SEALS

	Everyone	Community member	Campaign participant	Associated partner
Dissemination services	🦭	🦭	🦭	🦭
Community materials	🦭	🦭 *	🦭	🦭
Public collaboration services		🦭	🦭	🦭
Evaluation services		🦭	🦭 *	🦭
Private collaboration services				🦭
# Members		+250	29	1 U. Simón Bolívar (VE)

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Conclusions

- The SEALS Platform **facilitates**:
    - **Comparing tools** under common settings
    - **Reproducibility** of evaluations
    - **Reusing** evaluation resources, completely or partially
    - Or **defining** new ones
    - Managing evaluation resources **using platform services**
    - **Computational resources** for demanding evaluations
- **Don't start your evaluation from scratch!**

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Join the SEALS Community!

http://www.seals-project.eu/join-the-community

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