A Resemblance Study of Test Collections for World-altering Semantic Web Services

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Outline

- Introduction
- Test Collections
    - Available Test Collections
    - Portal
    - Web Crawlers
- Contests and Challenges
- Related Work

Semantic Web Services

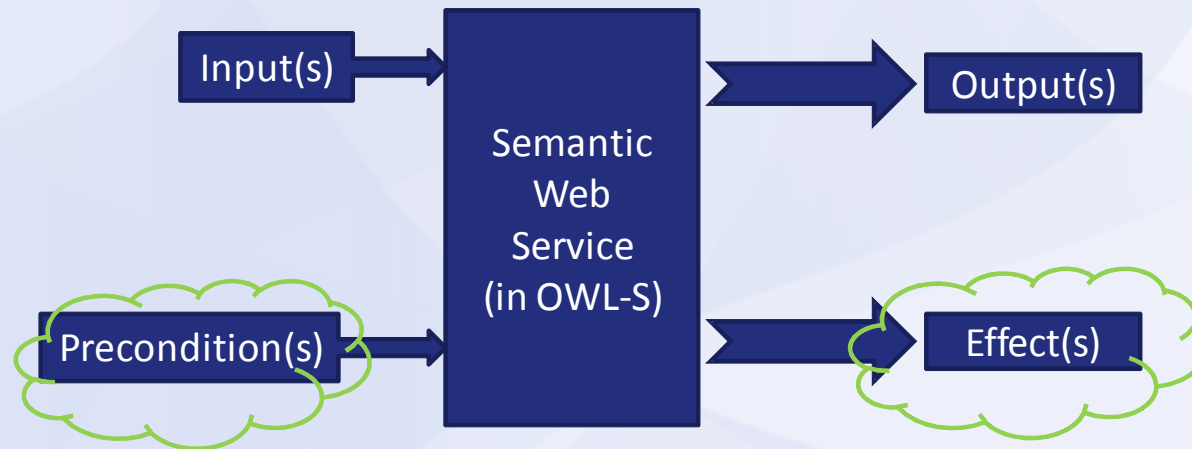- Web services described and annotated with machine-processable semantics

Semantic Web Services Categories

- Categories
  - Information Providing
    - weather conditions, news provider
  - **World-altering**
    - Credit card charging, Booking tickets

Semantic Web Services Categories, cont.

- Difference

  - World-altering services affect

    - something in the real-world (world-altering effect)
    - knowledge of the agent (knowledge effect)

World-altering Web services

- **Precondition**: A world state needed **before** the execution of a service

- **Effect**: A world state generated **after** the execution of a service

Test Collections

- A gathering of a reasonable number of services

- Production

  – Manual

  – Automatic

- A practical Web service testing approach to be applicable in the real-world needs realistic test data

- An ontology of used concepts is required

SWS-TC

- Generated manually by Ganjisaffar and Saboohi in 2006

- 241 semantic services, mostly real Web services

- 30 world-altering services (SWRL)

- A unified ontology

OWLS-TC

- Klusch, Kapahnke et al. developed it in 2005
- Actively being improving, 4th version Sep. 2010
- 1083 semantic services in OWL-S
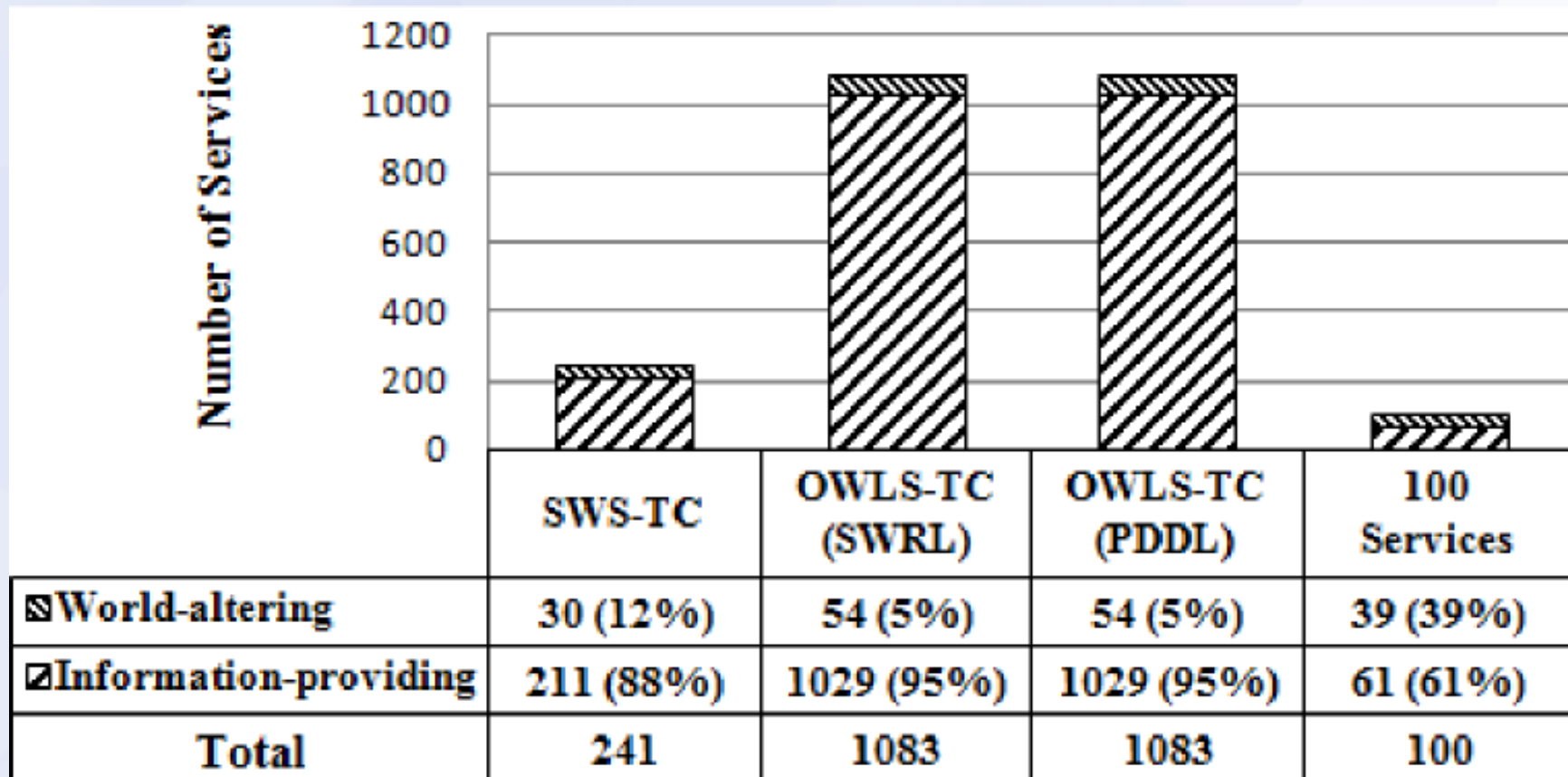- 54 world-altering services (SWRL, and PDDL)

SAWSDL-TC

- Klusch and Kapahnke

- It was first converted from OWLS-TC

- SAWSDL

- The number of world-altering services in this test collection is unknown

100 Services

- Ayse Basar Bener, Volkan Ozadali, and Erdem Savas Ilhan created the Test Collection

- Specific to their research (Not a public TC)

- 100 semantic services in OWL-S

- 39 world-altering services (SWRL)

Fractions of two service categories

	SWS-TC	OWLS-TC (SWRL)	OWLS-TC (PDDL)	100 Services
⊠ World-altering	30 (12%)	54 (5%)	54 (5%)	39 (39%)
☑ Information-providing	211 (88%)	1029 (95%)	1029 (95%)	61 (61%)
Total	**241**	**1083**	**1083**	**100**

Test Collections' Summary

Test Collection Name		SWS-TC	OWLS-TC (*SWRL*)	OWLS-TC (*PDDL*)	SAWSDL-TC	100 Services
Total number of services		241	*1083*	*1083*	1080	100
Number of services with	**Precondition**	10	158	158	Unknown	41
	Result (Effect)	30	54	54	Unknown	39
	Both { **Precondition** **Result (Effect)**	7	46	46	Unknown	39
Last release year		2006	2010	2010	2010	Paper published in 2009
Last version		1.1	4	4	3	Not applicable
Ontology		A Single, Unified	Multiple	Multiple	Multiple	Multiple
Semantic Service Description Language		OWL-S 1.1	OWL-S 1.0, OWL-S 1.1	OWL-S 1.0, OWL-S 1.1	SAWSDL	OWL-S 1.1
Precondition and Result (Effect) Language		SWRL	SWRL	PDDL	Not applicable	SWRL

OPOSSum

- An online portal for semantic services

- It assembles data from SWS-TC, OWLS-TC and some other sources

- It presently contains over 2800 descriptions for more than 1500 services

- Not being improved and updated

- No facility to search for world-altering services

Web Crawlers

- Traditional Web Services
  - Seekda's Web Services portal (28000 services)
- Semantic Services
  - SouSuo
  - Our crawler

Contests and Challenges

- SWS Challenge

- S3 (Semantic Service Selection)

    – OWLS-TC, SAWSDL-TC

- IEEE WSC (Web Service Challenge)

    – Test set generator

- SEALS – SWS

    – OWLS-TC, SAWSDL-TC

Conclusion

- There is a need for a Test Collection containing a reasonable number of service descriptions in different formalisms including both **information-providing** and **world-altering** services, especially:

    - OWL-S described services with SPARQL

    - A test collection for WSMO/WSML

    - A test collection for WSMO-Lite

Related Work

- (U. Kuster, and B. Konig-Ries, 2008) elaborates the needed features of test collections applicable for an evaluation of semantic Web service approaches.

  - Their paper lacks the required characteristics of world-altering services to be included in test collections.

- To the best of our knowledge, there is not any other similar work on test collections of SWS.

Q & A

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