

Open Linked Data @NARA

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Samos, 2013



Samos 2013 Summit
on Digital Innovation
for Government, Business and Society

www.samos-summit.org

Where

- IT department of Samos
- E-Gov division of NARA, Lesvos
- Reform of former Prefectural administrations in North Aegean
- Regional Administration with some local policies



What

- 2009-2010 (Samos-Dialogos project)
 - Samos IT Department @NARA
 - IMC Technologies SA
 - University of the Aegean, Info. Systems-Lab
 - University of the Aegean, Ai-Lab
- 2012-2013 (S3-AI project)
 - Samos IT Department @NARA
 - University of Piraeus, Digital Systems, Ai-Group

Why

- Share machine-readable data on the Web for use by public administrations, business and citizens
 - To connect local communities of citizens and allow them to share their views (social, political, other)
 - To share expert knowledge among public servants and organizations

How

- Use Linked Data paradigm as an enabler of e-Government transformation
- Opening data from
 - Samos-Dialogos project (Facilitating Dialogue Using Semantic Web Technology for eParticipation)
 - www.samos-dialogos.gr
 - S3-AI project (single-site IT helpdesk support application integration)
 - <http://www.samos.gr/apps/s3-ai/egovTicketapp.xhtml>

Samos-Dialogos project (1)

- **About:** eParticipation - ‘the use of ICT to broaden and deepen political participation by enabling citizens to connect with one another and with their elected representatives’
- **Approach:** multi-disciplinary, combining elements of political science and communication, software and knowledge engineering
- **Methodology:** support an efficient and transparent distributed decision-making
- **Technology:** based on Semantic Web technology, hiding its complexity behind a user-friendly Web2.0 interface

Use of Ontologies

- Model eDeliberation domains
- For every domain an ontology is created/reused and associated with the deliberation community
- eDeliberation Ontology
 - Makes the structure and semantics of the framework explicit, relying on standard ontologies (SIOC, MOAT, Tagging Ontology)
 - Makes content accessible to external applications as Linked Data
- Associating and annotating eDeliberations with ontologies:
 - Administrators browse and select an ontology to create an 1-1 association with an ongoing eDeliberation.
 - The selected ontology is automatically imported and processed to create a 'taxonomical equivalent'
 - The resulting taxonomy can be used to annotate items within the eDeliberation community space in the form of tagging

The 'Prefecture of Samos' Case

- <http://www.samos-dialogos.gr>
- Domains
 - Recycling
 - Culture
 - Tourism
- Domain ontologies created by knowledge workers/domain experts with the support of knowledge engineers of the University of Aegean (AI-Lab) using
 - collaborative authoring methods and tools (SharedHCONE)
 - related existing ontologies

The need to share knowledge

- For any given discussion topic, getting a holistic view involves **knowing what others think on the topic**, background information, existing arguments etc
- These are distributed over a wide range of resources: fora, social networking sites, mailing lists, newsgroups
- Enable sharing directly on the data level, via Linked Data

Linking opened data

Samos-Dialogos solution (by IMC SA) was also delivered in the:

- City of Trikala
- City of Thessaloniki
- City of Arta

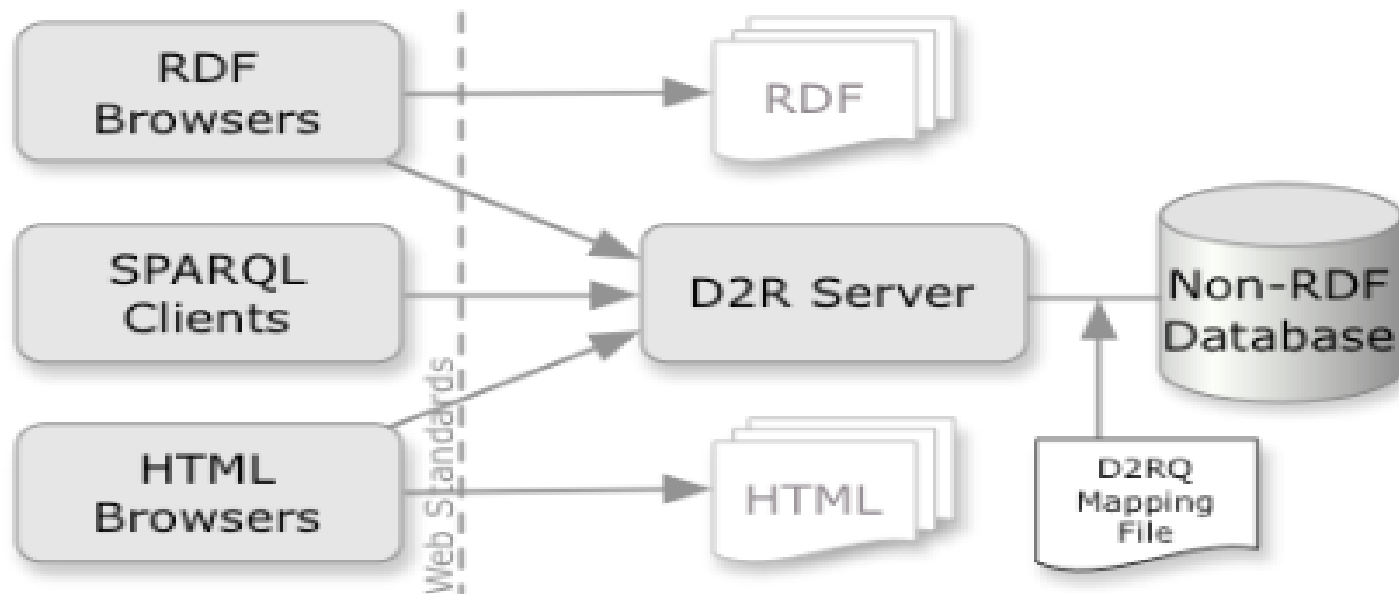
...creating an open and transparent ecosystem for:

- open debate
- open decision making process
- open data
- open software

Mapping and providing Opened Data via D2RQ

- Mapping the platform's relational database to the selected vocabularies using D2R Server + mapping language
- RDF available via SPARQL endpoint

<http://www.samos-dialogos.gr:2020/sparql>



Opened Data

- Snorql: Exploring <http://www.samos-dialogos.gr:2020/sparql>



Description of <http://www.samos-dialogos.gr:2020/resource/deliberation/politismos>



Resource URI: <http://www.samos-dialogos.gr:2020/resource/deliberation/politismos>

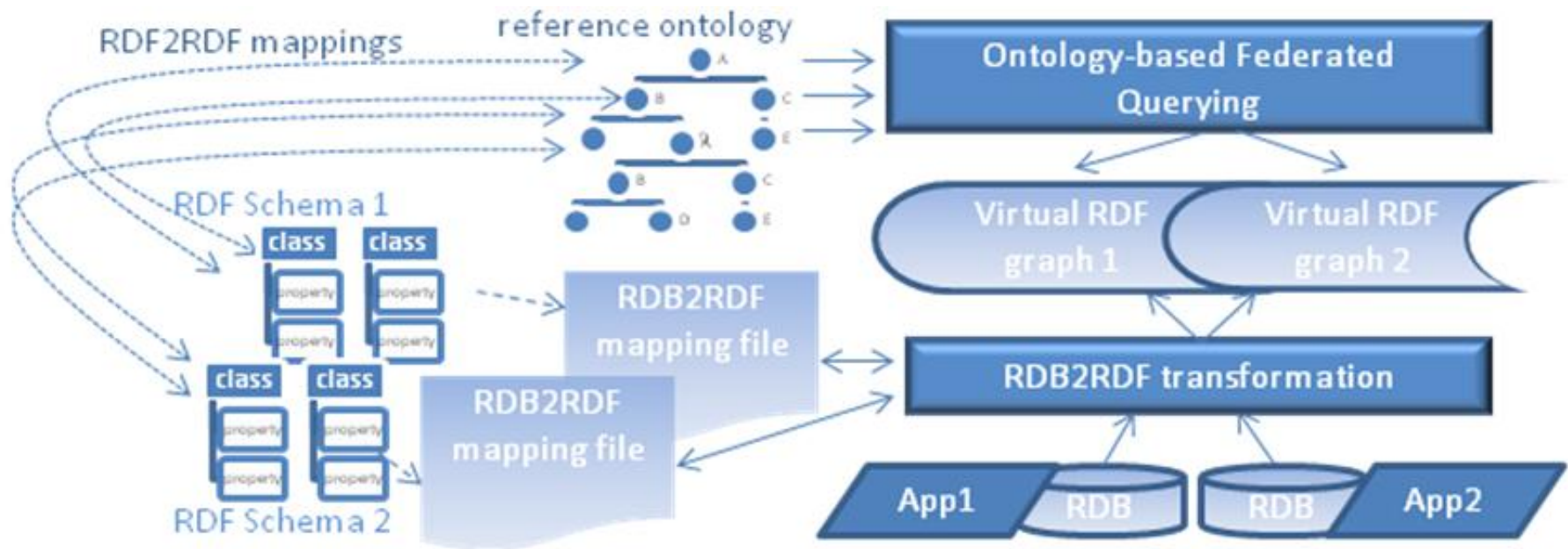
[Home](#) | [All Deliberation](#)

Property	Value
edialogos:hasTopicPositioningQuestionnaire	< http://www.samos-dialogos.gr:2020/resource/questionnaire/67 >
sioc:id	24501
sioc:link	< http://www.samos-dialogos.gr/web/politismos >
sioc:space_of	< http://www.samos-dialogos.gr:2020/resource/forum/26001 >
sioc:space_of	< http://www.samos-dialogos.gr:2020/resource/forum/26007 >
sioc:space_of	< http://www.samos-dialogos.gr:2020/resource/forum/26011 >
dc:title	Πολιτισμός
rdf:type	edialogos:Deliberation

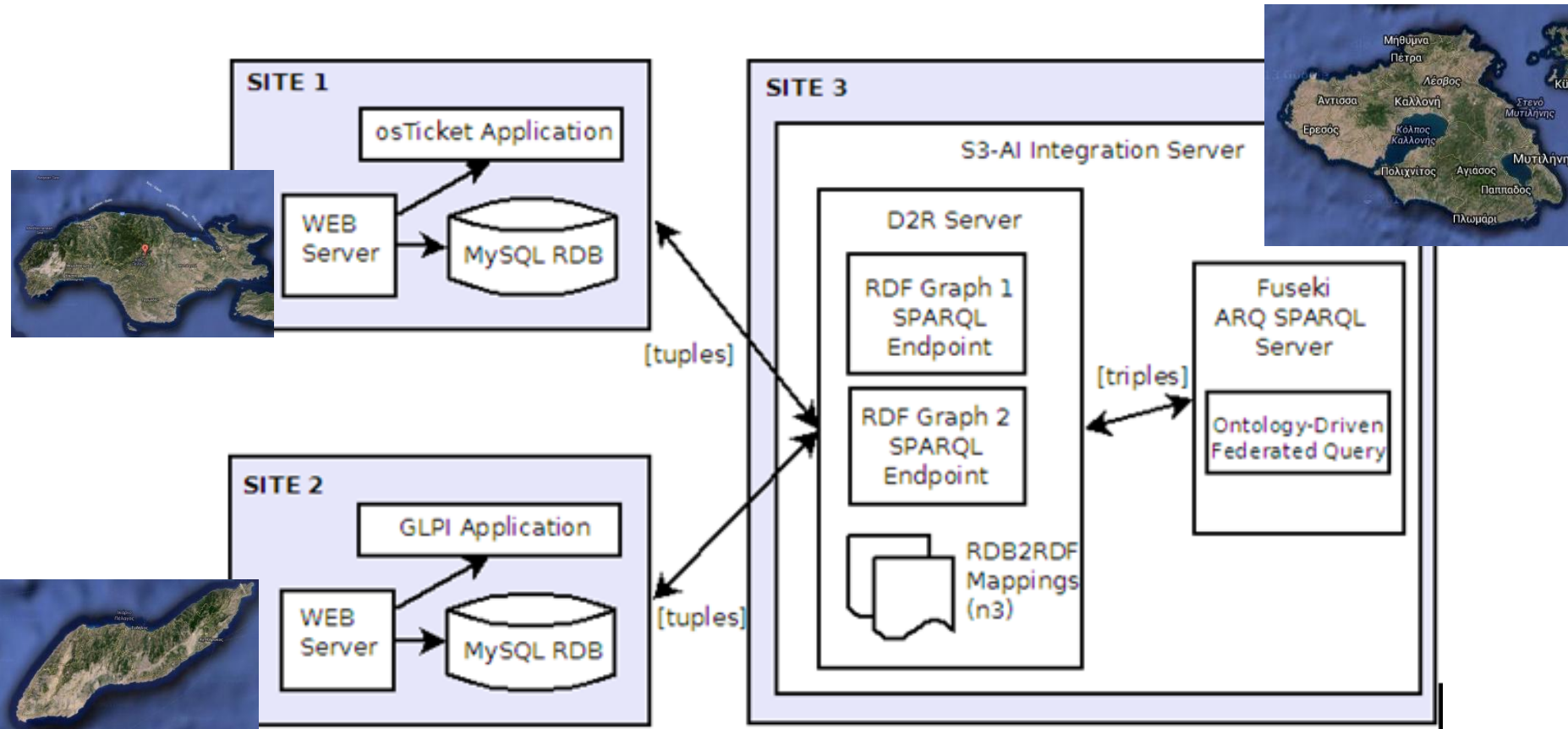
S3-AI project (2)

- **About:** Semantic Application Integration via Single-Site Opening of Multiple Data Sources
- **Approach:** Opening data and enabling its unified querying from a single site in a fast, simple, costless and maintenance-free way
- **Methodology:** support answering of unified, ontology-mediated federated queries on data produced and exploited by disparate applications, being located in different organizational sites, preserving ownership, autonomy and independency of applications and data
- **Technology:** Semantic Web technology (RDF model, OWL ontology, D2RQ platform, Fuseki SPARQL 1.1 query server)

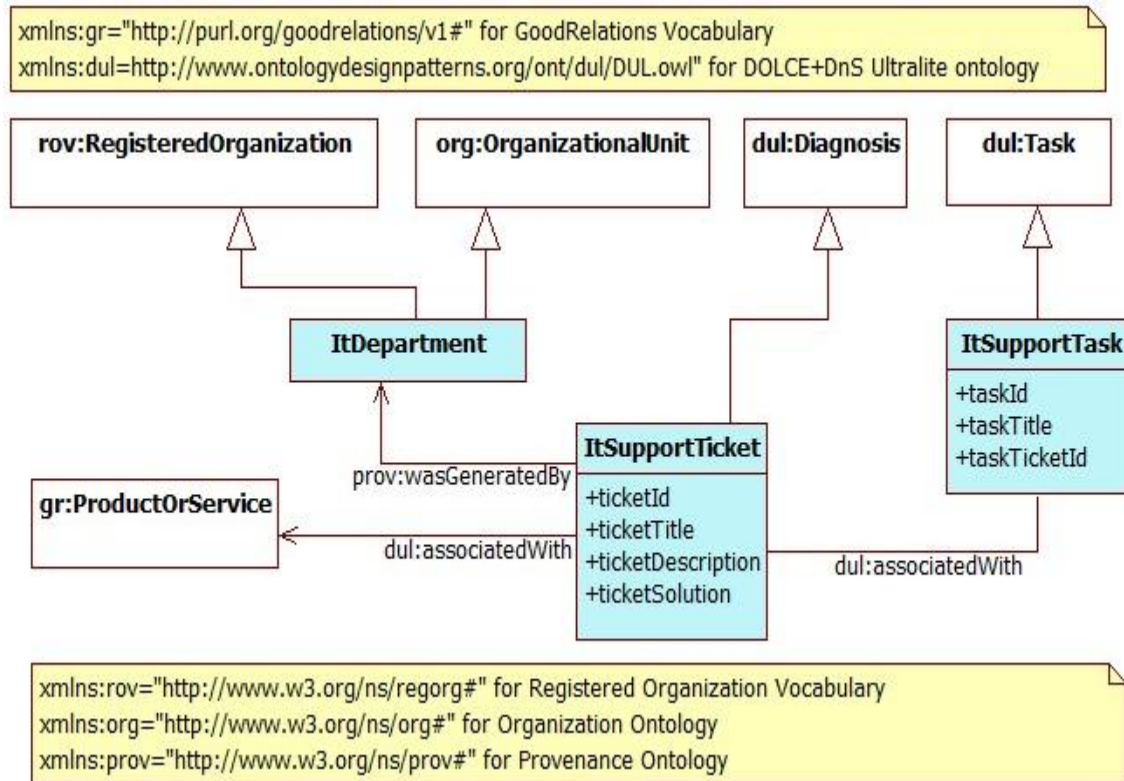
S3-AI architecture



Topology of an S3-AI implementation for integrating two sites



Domain-specific reference ontology for IT helpdesk support case



Open Linked Data

- Snorql: Exploring
 - <http://eupalinos.samos.gr:2020/sparql>
 - <http://eupalinos.samos.gr:2021/sparql>

← → ↻ 🏠 eupalinos.samos.gr:2021/page/glp_i_tickets/3 ☆ ☰

Description of http://eupalinos.samos.gr:2021/resource/glp_i_tickets/3 


Resource URI: http://eupalinos.samos.gr:2021/resource/glp_i_tickets/3

[Home](#) | [All glp_i_tickets](#)

Property	Value
db.vocab/glp_i_tickets_actiontime	2400 (xsd:integer)
db.vocab/glp_i_tickets_begin_waiting_date	2013-04-05T09:35:19 (xsd:dateTime)
db.vocab/glp_i_tickets_close_delay_stat	969 (xsd:integer)
db.vocab/glp_i_tickets_closedate	2013-04-05T09:47:09 (xsd:dateTime)
db.vocab/glp_i_tickets_cost_fixed	0 (xsd:decimal)
db.vocab/glp_i_tickets_cost_material	80 (xsd:decimal)
db.vocab/glp_i_tickets_cost_time	0 (xsd:decimal)
db.vocab/glp_i_tickets_date	2013-04-05T09:31:00 (xsd:dateTime)
db.vocab/glp_i_tickets_date_mod	2013-04-05T09:47:09 (xsd:dateTime)
db.vocab/glp_i_tickets_global_validation	none
db.vocab/glp_i_tickets_impact	3 (xsd:integer)
db.vocab/glp_i_tickets_is_deleted	false (xsd:boolean)
db.vocab/glp_i_tickets_items_id	0 (xsd:integer)
db.vocab/glp_i_tickets_itemtype	
db.vocab/glp_i_tickets_type	1 (xsd:integer)
db.vocab/glp_i_tickets_urgency	3 (xsd:integer)
db.vocab/glp_i_tickets_users_id_lastupdater	2 (xsd:integer)
db.vocab/glp_i_tickets_users_id_recipient	2 (xsd:integer)
db.vocab/glp_i_tickets_waiting_duration	0 (xsd:integer)
hdo.ticketDescription	"No Video" error on monitor/display during PC boot.
hdo.ticketId	3 (xsd:integer)
hdo.ticketSolution	<p>Replaced VGA card.</p>
hdo.ticketTitle	"No Video" error
rdf.type	hdo:ItSupportTicket

The server is configured to display only a limited number of values (limit per property bridge: 50).

← → ↻ 🏠 eupalinos.samos.gr:2020/page/ost_ticket/1000 ☆ ☰

Description of http://eupalinos.samos.gr:2020/resource/ost_ticket/1000 

Resource URI: http://eupalinos.samos.gr:2020/resource/ost_ticket/1000

[Home](#) | [All ost_ticket](#)

Property	Value
db.vocab/ost_ticket_closed	2013-02-14T14:11:32 (xsd:dateTime)
db.vocab/ost_ticket_created	2013-02-04T10:47:14 (xsd:dateTime)
db.vocab/ost_ticket_dept_id	1 (xsd:integer)
db.vocab/ost_ticket_email	kostas.gerontis@samos.gr
db.vocab/ost_ticket_helptopic	Helpdesk
db.vocab/ost_ticket_ip_address	10.129.46.22
db.vocab/ost_ticket_isanswered	true (xsd:boolean)
db.vocab/ost_ticket_isoverdue	false (xsd:boolean)
db.vocab/ost_ticket_lastmessage	2013-02-04T10:47:14 (xsd:dateTime)
db.vocab/ost_ticket_lastresponse	2013-02-14T14:11:24 (xsd:dateTime)
db.vocab/ost_ticket_name	ΒΑΓΓΕΛΗΣ ΜΑΡΟΥΔΗΣ
db.vocab/ost_ticket_phone	
db.vocab/ost_ticket_phone_ext	
db.vocab/ost_ticket_priority_id	2 (xsd:integer)
db.vocab/ost_ticket_source	Other
db.vocab/ost_ticket_staff_id	0 (xsd:integer)
db.vocab/ost_ticket_status	closed
db.vocab/ost_ticket_topic_id	1 (xsd:integer)
db.vocab/ost_ticket_updated	2013-02-14T14:11:32 (xsd:dateTime)
hdo.ticketId	1000 (xsd:integer)
hdo.ticketTitle	ΚΩΣΤΑΣ ΓΕΡΟΝΤΗΣ
rdf.type	hdo:ItSupportTicket

The server is configured to display only a limited number of values (limit per property bridge: 50).

Example of an ontology-mediated federated SPARQL query executed at <http://eupalinos.samos.gr:3030/sparql.tpl>

← → ↻ 🏠 eupalinos.samos.gr:3030/sparql.tpl

Fuseki Query

Dataset: /ds

SPARQL Query

```
PREFIX hdo: <http://www.samos.gr/ontologies/helpdeskOnto.owl#>
SELECT DISTINCT ?glpiTickets ?ostTickets ?title
WHERE {
  {
    SERVICE <http://eupalinos.samos.gr:2021/sparql> {
      ?glpiTickets a hdo:ItSupportTicket.
      ?glpiTickets hdo:ticketTitle ?title.
      FILTER regex(?title, "No Video").
    }
  }
  UNION
  {
    SERVICE <http://eupalinos.samos.gr:2020/sparql> {
      ?ostTickets a hdo:ItSupportTicket.
      ?ostTickets hdo:ticketTitle ?title.
      FILTER regex(?title, "No Video").
    }
  }
}
```

← → ↻ 🏠 [eupalinos.samos.gr:3030/ds/query?query=PREFIX+hdo%3A+<http%3A%2F%2Fwww.samos.gr%2Fontologies%2FhelpdeskOnto.owl%23>SELECT+DISTINCT+%3FglpiTickets+%3FostTickets+%3Ftitle+WHERE+%7B+%7B+SERVICE+%3Chttp%3A%2F%2Feupalinos.samos.gr%3A2021%2Fsparql%3E+%7B+%3FglpiTickets+a+hdo%3AItSupportTicket.+%3FglpiTickets+hdo%3AticketTitle+%3Ftitle.+FILTER+regex\(%3Ftitle,+%22No+Video%22\).%7D+%7D+UNION+%7B+SERVICE+%3Chttp%3A%2F%2Feupalinos.samos.gr%3A2020%2Fsparql%3E+%7B+%3FostTickets+a+hdo%3AItSupportTicket.+%3FostTickets+hdo%3AticketTitle+%3Ftitle.+FILTER+regex\(%3Ftitle,+%22No+Video%22\).%7D+%7D+%7D](http://eupalinos.samos.gr:3030/ds/query?query=PREFIX+hdo%3A+<http%3A%2F%2Fwww.samos.gr%2Fontologies%2FhelpdeskOnto.owl%23>SELECT+DISTINCT+%3FglpiTickets+%3FostTickets+%3Ftitle+WHERE+%7B+%7B+SERVICE+%3Chttp%3A%2F%2Feupalinos.samos.gr%3A2021%2Fsparql%3E+%7B+%3FglpiTickets+a+hdo%3AItSupportTicket.+%3FglpiTickets+hdo%3AticketTitle+%3Ftitle.+FILTER+regex(%3Ftitle,+%22No+Video%22).%7D+%7D+UNION+%7B+SERVICE+%3Chttp%3A%2F%2Feupalinos.samos.gr%3A2020%2Fsparql%3E+%7B+%3FostTickets+a+hdo%3AItSupportTicket.+%3FostTickets+hdo%3AticketTitle+%3Ftitle.+FILTER+regex(%3Ftitle,+%22No+Video%22).%7D+%7D+%7D) ☆

SPARQLer Query Results

glpiTickets	ostTickets	title
http://eupalinos.samos.gr:2021/resource/gpi_tickets/3		"No Video" error
http://eupalinos.samos.gr:2021/resource/gpi_tickets/4		"No Video" error
	http://eupalinos.samos.gr:2020/resource/ost_ticket/1149	"No Video" error
	http://eupalinos.samos.gr:2020/resource/ost_ticket/1170	No Video

Output: XML ▼

XSLT style sheet (blank for none): /xml

Force the accept header to text/plain

Get Results

Assessing opening of data

- **Cookbook for Open Linked Gov. Data**
 - **W3C, JoinUp/ISA, LOV**
- **Five Stars of Linked Open Government Data**
- **The 7 Best Practices for Producing Linked Data**

Model the data
Re-use vocabularies whenever possible
Name things with persistent URIs
Publish human and machine readable descriptions
Convert data to RDF
Specify an appropriate license
Host the Linked Dataset publicly and announce it!



Data Dissemination

- Linked Open Vocabularies (LOV)

- http://lov.okfn.org/dataset/lov/details/vocabulary_hdo.html



- ISA/Joinup, Semantic assets

- http://joinup.ec.europa.eu/catalogue/asset_release/it-helpdesk-support-ontology



Research work dissemination

- Anadiotis, G., P. Alexopoulos, K. Mpaslis, A. Zosakis, K. Kafentzis, and K. Kotis, "Facilitating Dialogue - Using Semantic Web Technology for eParticipation", Extended Semantic Web Conference (ESWC) 2010
- I. Athanasakis, K. Kotis, G. Vouros, " Semantic Application Integration via Single-Site Opening of Multiple Data Sources", submitted in ISWC2013 (under review)

Future work

- Apply of S3-AI approach in Sensor/Observations data projects
 - **PREMARPOL** (INTERREG Greece-Cyprus)
 - Prevention of Marine Pollution
 - URL: <http://www.oceanography.ucy.ac.cy/pages/premarpol>
 - **AMINESS** (National project)
 - Analysis of Marine Information for Environmentally- Safe Shipping
 - URL: <http://www.aminess.eu>

Thank you



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