



Linked Open Statistical Data in Greece

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**Share-PSI 2.0 Workshop@ Samos 2014 Summit
June 2014**

Our focus: Statistical PSI in Greece

- Collected & Published by national statistical agency, e.g.
 - Census data
 - Geospatial Data
 - Socioeconomic indices, GDP, etc.
- Usually provided in
 - tabular format, csv, xls, html
 - aggregated rather than micro data
 - multidimensional observations

Who uses them?

- Government & Local Administration
 - Financial policy making
 - Drawing of new administrative regions
 - Development of new rural areas
 - Education & Health planning
 - Environmental & Energy planning
 - Forecasting future transportation needs
 - Reapportioning seats in the parliament
 - Analyzing quality-of-life indices & trends
- Media,
- Market analysis in private sector, (real estate, constructions, retail).
- Individuals, engineers, social scientists, independent researchers ... and many more

Statistical Information **costs a lot of money** to
collect, integrate, curate, analyze

Greek Census 2011

Inhabitants

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΚΕΝΤΡΙΚΟ ΣΤΑΤΙΣΤΙΚΟ ΓΡΑΦΕΙΟ
ΔΕΛΤΙΟ ΑΠΟΓΡΑΦΗΣ ΑΤΟΜΟΥ
ΤΗΣ 9ης ΜΑΪΟΥ 2011

1. Επωνυμία: Ονομα πατρός ή μητρός / Ονομα μητρός

2. Φύλο: Άρσεν / Θύλη

3. Ημερομηνία γέννησης

4. Σχέση με τον απογραφέντη: Α. Σχέση με τον απογραφέντη (Παιδί που διαμένει στην τελευταία κατοικία της Δεκάτης 9/5/2011) / Β. Προηγούμενη φιλοξενία

5. Παιδί που απογραφείται από μητέρα (κατάσταση της) / Αλλά

6. Οικονομική κατάσταση

7. Τύπος μόνιμης κατοικίας της μόνιμης στέγης (εάν υπάρχει) / Αλλοι

8. Ποιος δημόσιος Έλληνας (ήταν) Δήμιος ή Κοινοτικός το Δημοτικό ή στην Εγγεγραμμένη: Αντίθετα που απογραφεται / Άλλος (θέσε γράσει)

9. Έχει ποτέ διαμείνει σε άλλο κράτος της Ελλάδας: Αν ναι: α. Ημερομηνία εγκατάστασης στην Ελλάδα / β. Ημερομηνία επιστροφής στην Ελλάδα / γ. Αίτια εγκατάστασης στην Ελλάδα / δ. Αίτια επιστροφής στην Ελλάδα

10. Έχει ποτέ διαμείνει σε χώρα εξωτερικού: Αν ναι: α. Ημερομηνία εγκατάστασης στην Ελλάδα / β. Ημερομηνία επιστροφής στην Ελλάδα / γ. Αίτια εγκατάστασης στην Ελλάδα / δ. Αίτια επιστροφής στην Ελλάδα

Households and dwellings

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΚΕΝΤΡΙΚΟ ΣΤΑΤΙΣΤΙΚΟ ΓΡΑΦΕΙΟ
ΔΕΛΤΙΟ ΑΠΟΓΡΑΦΗΣ ΟΙΚΙΑΣ - ΝΟΙΚΟΚΥΡΙΟΥ
ΤΗΣ 9ης ΜΑΪΟΥ 2011

1. Είδος κατοικίας: Κανονική κατοικία / Άλλη είδους χώρος που προορίζεται για κατοικία (καλύβα, πρόχειρη κατοικία κ.λπ.)

2. Κατάσταση κατοικίας: α. Κατοικούμενη από μόνιμους κατοίκους / β. Κενή / γ. Κατοικία με κατοίκους που μένουν μόνιμα σε άλλη κατοικία

3. Τύπος κτηρίου όπου βρίσκεται η κατοικία: Μονοκατοικία / Διπλοκατοικία / Πολυκατοικία / Κτίριο που η κύρια χρήση του δεν είναι κατοικία / Οροφός

4. Περίοδος κατασκευής: Προ 1919 / 1919 - 1945 / 1946 - 1960 / 1961 - 1970 / 1971 - 1980 / 1981 - 1990 / 1991 - 2000 / 2001 - 2005 / 2006+

5. Συνολική επιφάνεια της κατοικίας (μ²): α. Με δίκτυο μέσο στην κατοικία / β. Με δίκτυο εκτός κατοικίας

6. Αριθμός κανονικών δωμάτων εκτός κοινόχρηστων: α. Με υδραυλική εγκατάσταση / β. Δεν έχει κοινόχρηστο / γ. Διακοσμητικές μαρμαρώσεις παραθύρων σε άλλο χώρο

7. Κοζίνα: α. Έχει κοζίνα / β. Δεν έχει κοζίνα

8. Υθροσκάκι: α. Με δίκτυο μέσο στην κατοικία / β. Με δίκτυο εκτός κατοικίας / γ. Δεν έχει υθροσκάκι

9. Λουτρό ή ντους: Μέσο στην κατοικία / Δεν έχει λουτρό ή ντους

10. Τουαλέτα ή WC: Μέσο στην κατοικία / Δεν έχει τουαλέτα ή WC

Cost: ~ 70M Euro!!!

- sex, marital status, nationality, educational level, address, etc.

- type of residence, total area, facilities, number of residents, etc.



Statistical Themes



Statistical Database



Digital Library



Portal Demo



European Statistical Data
Support center (ESDS)



Search the Portal



Comments and
Feedback



Login Credentials

Username:

Password:

- [Sign up](#)
- [Password reminder](#)

Population Census 2011

Main Portal Page > **Population Census 2011** 

Population Census 2011

Revised Resident population

- » [Announcement of the revision of the results of the 2011 Population and Housing Census for the Resident, De Jure \(registered\) and De Facto population of Greece](#)

Revised De Jure (registered) population

- » [Announcement of the revision of the results of the 2011 Population and Housing Census for the Resident, De Jure \(registered\) and De Facto population of Greece](#)
- » [Table. The De Jure \(registered\) population 2011](#)

Revised DE FACTO population

- » [Announcement of the revision of the results of the 2011 Population and Housing Census for the Resident, De Jure \(registered\) and De Facto population of Greece](#)

Rest

» Resident population before revision

- » [Announcement of the demographic and social characteristics of the Resident Population of Greece according to the 2011 Population-Housing Census](#)
- » [Tables of demographic and social characteristics of the Resident Population of Greece \(2011 Population-Housing Census\)](#)
- » [Announcement Census 2011 - Resident Population](#)

» De Jure (registered) population before revision

- » [Announcement of the De Jure \(registered\) Population 2011](#)
- » [Table. The De Jure \(registered\) Population 2011](#)

» DE FACTO population before revision

- » [Announcement of the DE FACTO Population 2011](#)





- Statistical Themes
- Statistical Database
- Digital Library
- Portal Demo
- European Statistical Data Support center (ESDS)
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- Comments and Feedback
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Resident population before revision

Announcement of the demographic and social characteristics of the Resident Population of Greece according to the 2011 Population-Housing Census

Announcement of the demographic and social characteristics of the Resident Population of Greece (2011 Population-Housing Census)
Announcement Census 2011 - Resident Population

» De Jure (registered) population before revision

- » Announcement of the De Jure (registered) Population 2011
- » Table. The De Jure (registered) Population 2011

» DE FACTO population before revision

- » linked-statistics.gr @ Samos Summit 2014
- » Announcement of the DE FACTO Population 2011



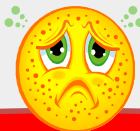
Dataset catalog in .pdf format



Table (Dataset) in .xls



No browsing,
No querying



No metadata (date, reason,
authorship, etc.) for datasets



- Statistical Themes
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- Digital Library
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Population Census 2011

Main Portal Page > **Population Census 2011**

Population Census 2011

Revised Resident population

- Announcement of the revision of the results of the 2011 Population and Housing Census (resident, De Jure (registered) and De Facto population) 2011

Revised De Jure (registered) population

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- Table. The De Jure (registered) population 2011

DE FACTO population before revision

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DE FACTO population before revision

- Announcement of the DE FACTO Population 2011

OPEN DATA



Large Cost
Little Use
Low Value



Statistical Themes



Statistical Databases



Digital Library



Portal Demo



Login Credentials

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Password:

Login

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Population Census 2011

Main Portal Page > **Population Census 2011**

Population Census 2011

LINKED OPEN DATA

Revised De Jure (registered) population

GENERAL
POPULATION
CENSUS

- High quality : Uniform Metadata – Common Vocabularies and standards
- Machine-readable, Citable datasets – URIs to link
- Discover, Query and Browse Information
- Easily consumed, combined with other sources, produce new insights

» DE FACTO population before revision

linked-statistics.gr @ Samos Summit 2014

» Announcement of the DE FACTO Population 2011

Statistical data → multidimensional LOD

Inhabitants

Households

Published in .xls format



Επίπεδο διοικητικής διαίρεσης	α/α	Γεωγραφικός κωδικός ΚΑΔ	Περιγραφή	Μόνιμος πληθυσμός
5	6	1102	ΔΗΜΟΣ ΑΡΡΙΑΝΩΝ (Έδρα: Φιλαδέφεια)	18.577
9	7	010202	ΔΗΜΟΤΙΚΗ ΕΝΟΤΗΤΑ ΑΡΡΙΑΝΩΝ	5.581
10	7	01020202	Τοπική Κοινότητα Λιχώριου	226
11	8	0102020201	Λιχώριον, το	1.147
12	7	01020201	Τοπική Κοινότητα Αρριανών	1.147
13	8	0102020101	Αρριανιά, τα	314
14	7	01020203	Τοπική Κοινότητα Δαρμηνής	314
15	8	0102020301	Δαρμηνή	307
16	7	01020204	Τοπική Κοινότητα Δελινών	265
17	8	0102020401	Δελινιά, τα	265
18	7	01020205	Τοπική Κοινότητα Ηπίου	171
19	8	0102020501	Ηπίον, το	171
20	7	01020206	Τοπική Κοινότητα Κινώρων	1.016
21	8	0102020601	Κινώρα, τα	1.016
22	7	01020207	Τοπική Κοινότητα Λυκείου	433
23	8	0102020701	Λυκειόν, το	433
24	7	01020208	Τοπική Κοινότητα Μικρού Πιστού	411
25	8	0102020801	Μικρόν Πιστόν, το	411
26	7	01020209	Τοπική Κοινότητα Μύστακα	26
27	8	0102020901	Μύστακας, ο	26
28	7	01020210	Τοπική Κοινότητα Νέδας	94
29	8	0102021001	Νέδα, η	94
30	7	01020211	Τοπική Κοινότητα Νικητών	

geographical code
(Dimension)

Permanent population
(Observation)



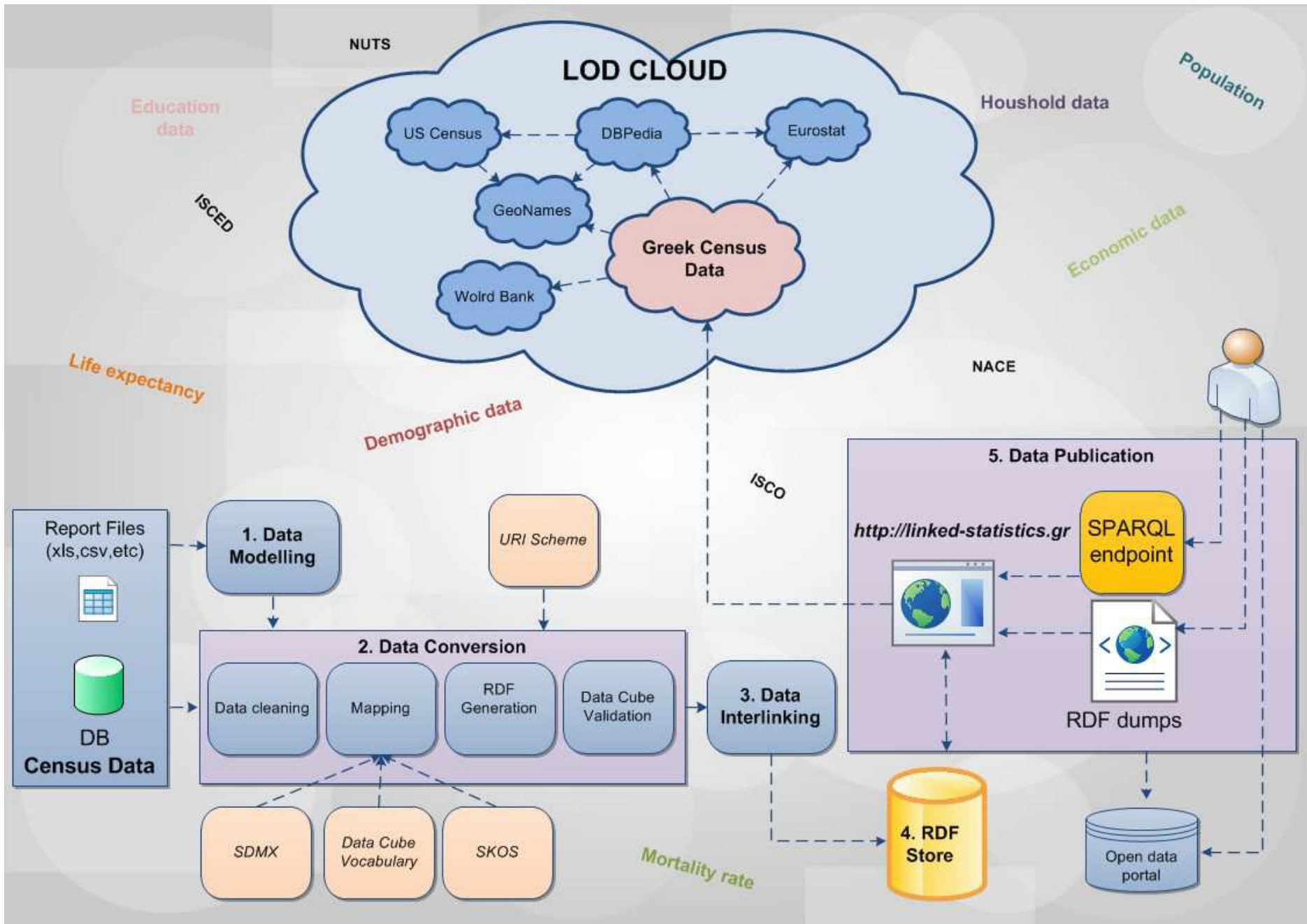
Convert to RDF

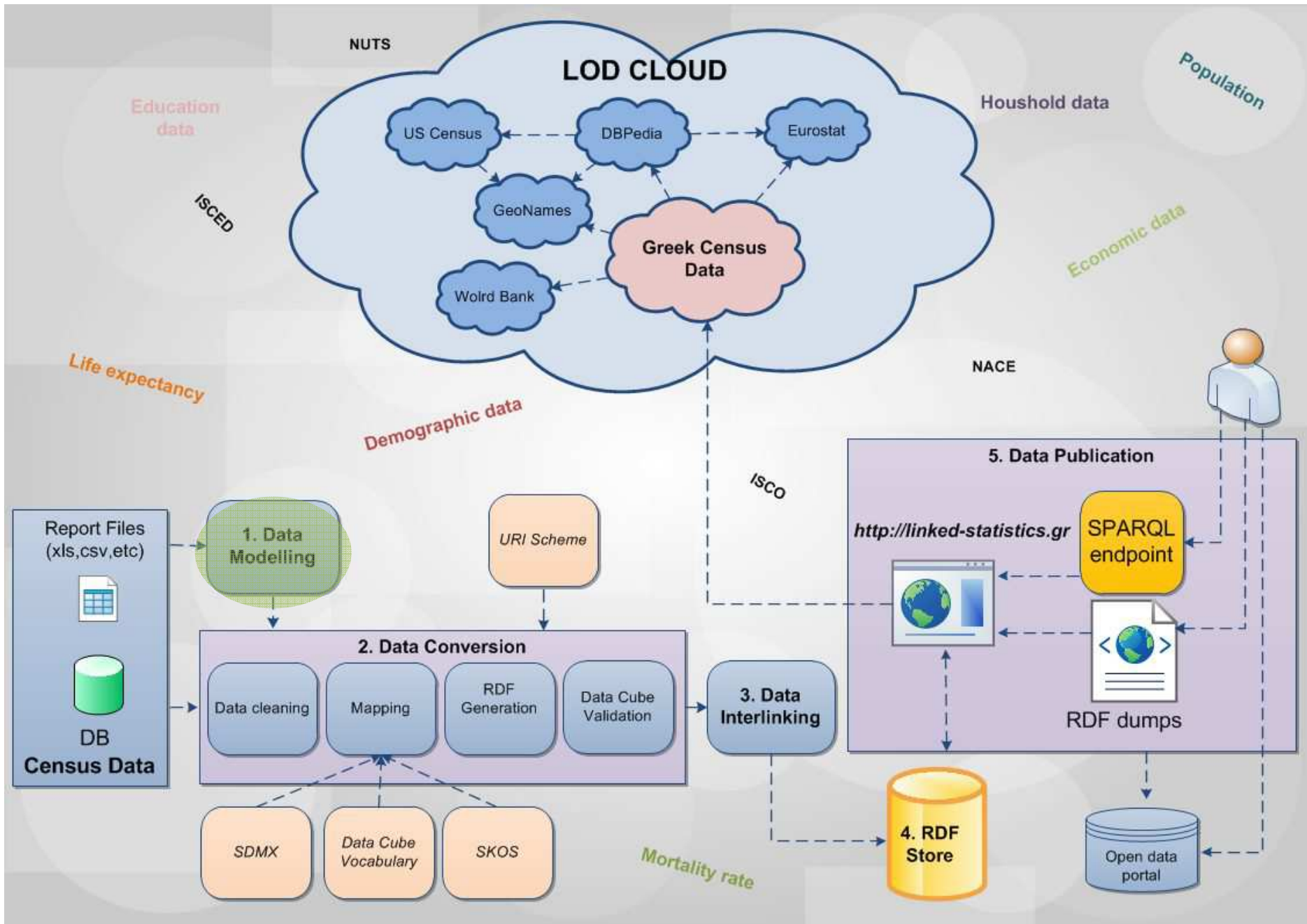
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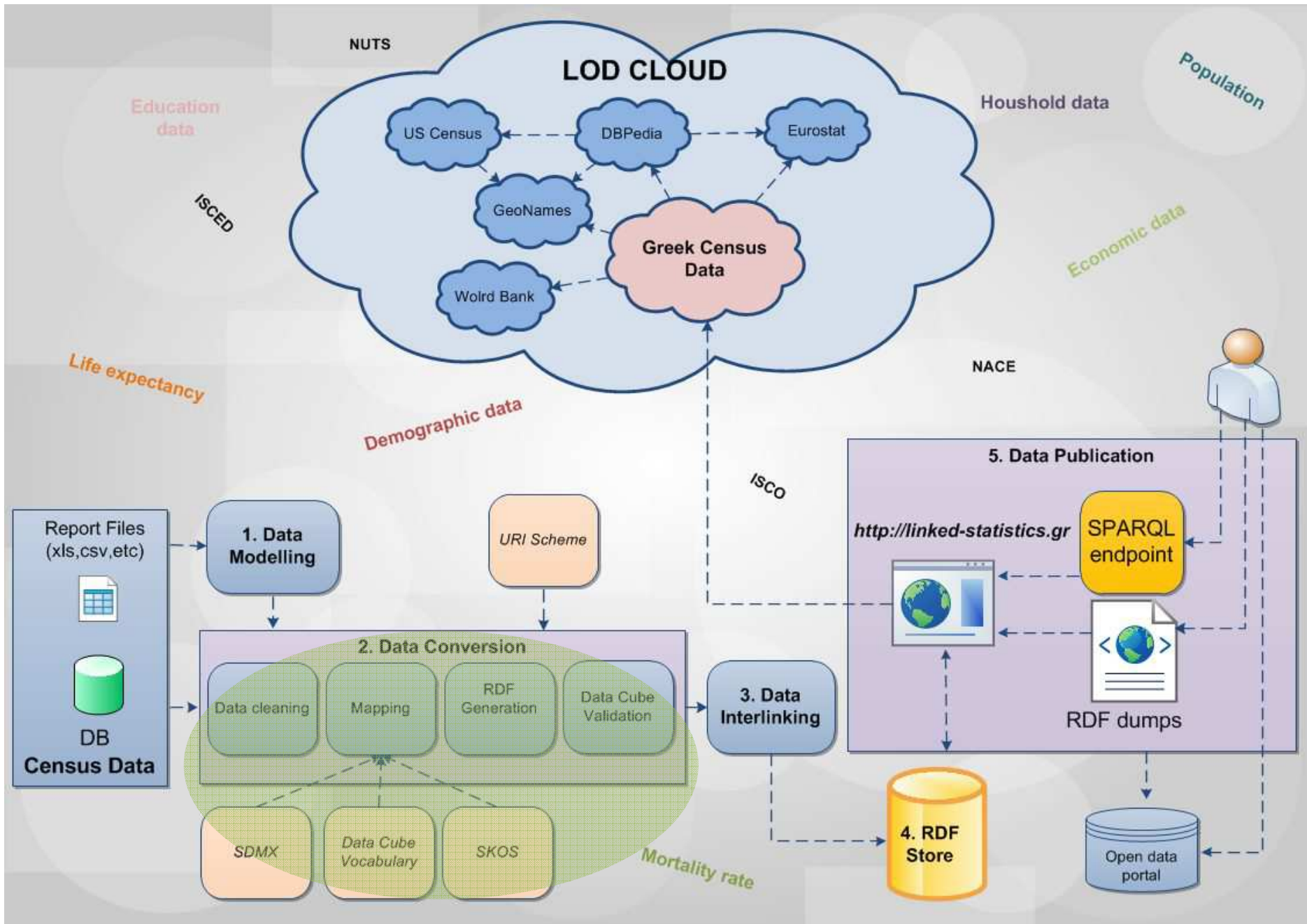
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  <rdf:type rdf:resource="http://purl.org/linked-data/cube#Observation"/>
  <sdmx-dimension:refArea rdf:resource="http://linked-statistics.gr/resource/admin-division/2011/municipality/1110102"/>
  <populationMeasure xmlns="http://linked-statistics.gr/ontology/qb-components#" rdf:datatype="http://www.w3.org/2001/XMLSchema#int">16577</populationMeasure>
  <qb:dataSet rdf:resource="http://linked-statistics.gr/resource/dataset/per-pop-geo"/>
  <sdmx-dimension:refPeriod rdf:resource="http://reference.data.gov.uk/id/gregorian-year/2011"/>
</rdf:Description>
  
```

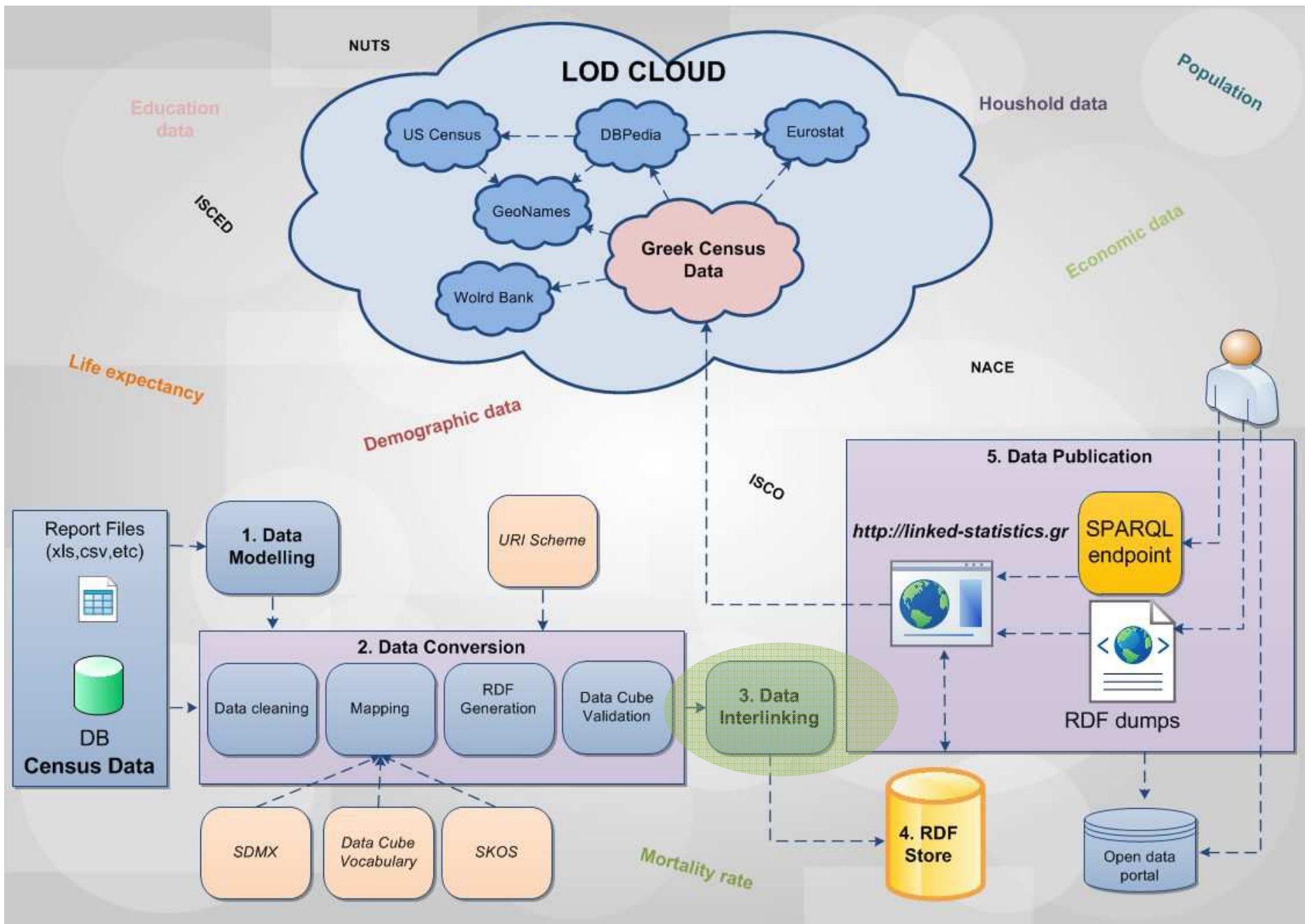
Output

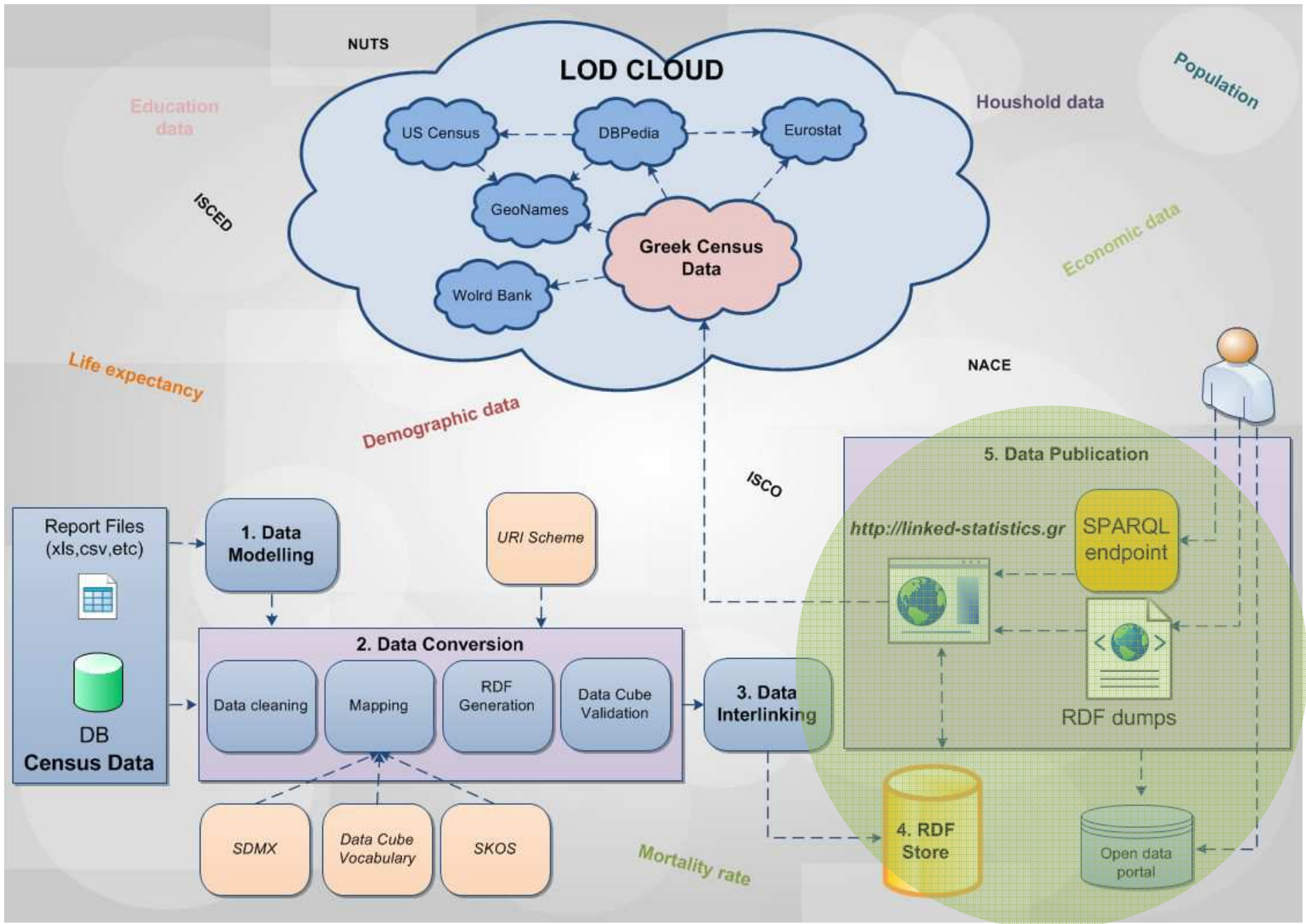
- Methodology & Tool for transforming spreadsheets to multidimensional Linked Data
- A step-by-step guide
 - Make it easy for the Data curator, the non-expert user (e.g. statisticians)
 - Make use of open tools and standards for publishing PSI
- Encourage users of statistical data to consume LOD in their analysis (e.g. social scientists).
 - simplify the data linking process,
 - promote data integration and mash ups











Publishing Greek statistics as LOD

- Follows best practices for Linked Data
 - Reuse of standard statistical vocabularies, such as the *Data Cube Vocabulary*, *SDMX*, and *SKOS*.
 - URI naming, provenance information for datasets
 - Interlink with other statistical concepts & datasets
 - Use of existing publishing tools & RDF storage technologies.

How to use linked-statistics.gr

The screenshot shows the homepage of linked-statistics.gr. At the top left is the logo with the text "Publishing statistical data as Linked Open Data". A navigation bar includes "About", "Download", "SPARQL Endpoint", "Publications", and "Contact Us". A dropdown menu under "Download" lists "Datasets", "Ontologies", and "Codelists". The main content area features a "Welcome to linked-statistics.gr" message and a "What is linked-statistics.gr?" section. On the right, there is a logo for "INEY IMIS" and a "Useful Links" section with a link to "IMIS_B.C 'Athena'".

Four red callout boxes are overlaid on the image:

- Query**: Points to the "Query" button in the top right.
- Link**: Points to the URL <http://linked-statistics.gr/resource/dataset/reg-pop-geo/obs/2011/46259> in the "About" section.
- Download**: Points to the "Download RDF Data" section on the right.
- Browse**: Points to the "Browse" button at the bottom center.

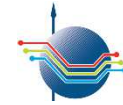
About: <http://linked-statistics.gr/resource/dataset/reg-pop-geo/obs/2011/46259>
An Entity of Type : [Observation](#), within Data Space : [linked-statistics.gr](#)
[Start faceted browsing from this Type](#)

Attributes	Values
rdf:type	qb:Observation
Πληθυσμός	11308(xsd:integer)
Περιοχή αναφοράς	ΠΕΡΙΦΕΡΕΙΑΚΗ ΕΝΟΤΗΤΑ ΑΝΔΡΟΥ
qb:dataset	Registered (De jure) Population per geographical area
Περίοδος αναφοράς	interval:2011

Download RDF Data
Dataset Name: Resident population
Structure: [data structure definition](#) [5.92 KB]
Dimensions: [geographical areas](#)
Download data per:
[All administrative divisions](#) [13.53 MB]
[Original dataset: XLS](#)

Project Overview

- Organization, management and map representation of socio-demographic data collected from the last three Greek Population Censuses in 1991, 2001 & 2011.
- The census data from the three censuses will be available:
 - **PANORAMA**: Map Visualization portal
 - <http://linked-statistics.gr>: LOD provision
 - **Kalidoskopio**: Analysis and provision of indices for poverty, social exclusion, politics & elections, etc.



NATIONAL CENTRE FOR SOCIAL RESEARCH

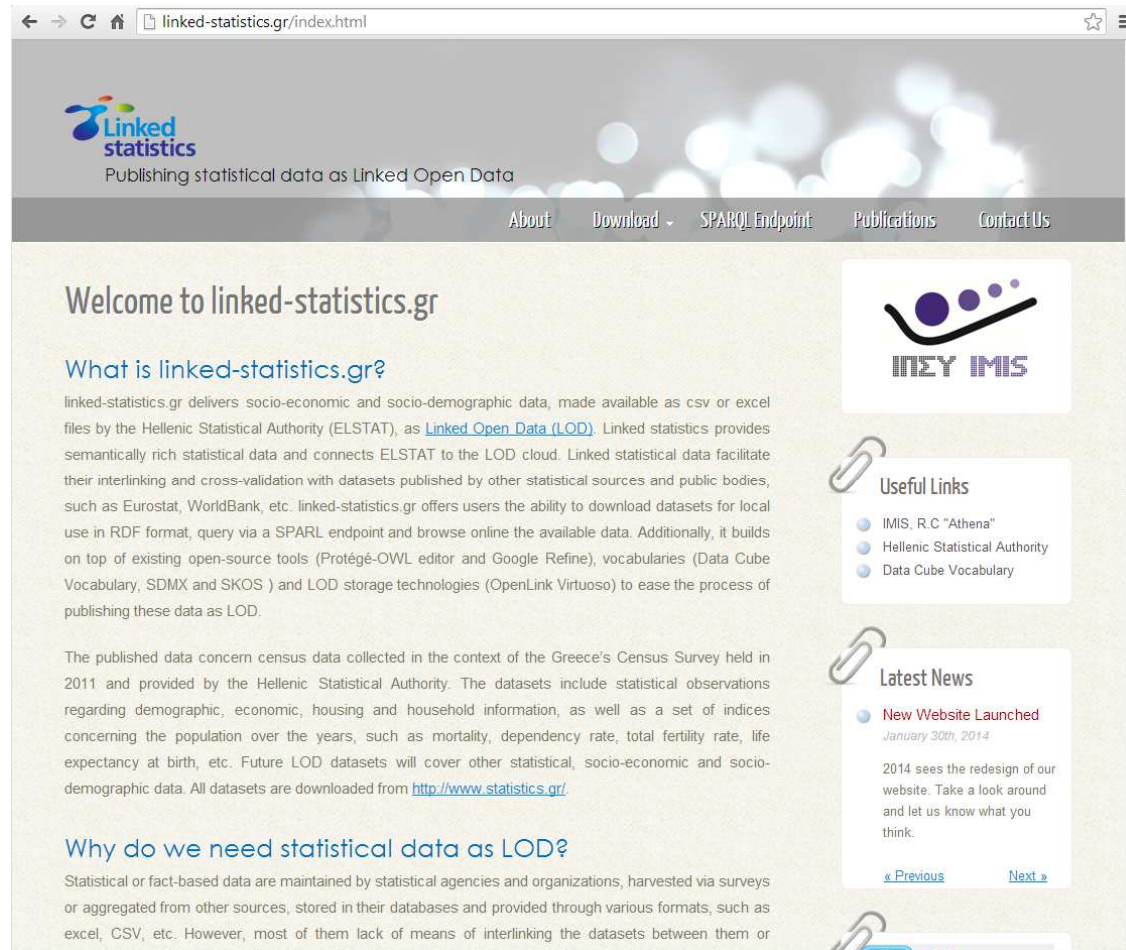


This research is co-financed by the European Union (European Regional Development Fund - ERDF) and Greek national funds through the Operational Program "Competitiveness and Entrepreneurship" (OPCE II) of the National Strategic Reference Framework (NSRF) - Research Funding Program: KRIPIS.



mit 2014

Thank you!



The screenshot shows the homepage of linked-statistics.gr. The browser address bar displays 'linked-statistics.gr/index.html'. The website header features the 'Linked statistics' logo and the tagline 'Publishing statistical data as Linked Open Data'. A navigation menu includes 'About', 'Download', 'SPARQL Endpoint', 'Publications', and 'Contact Us'. The main content area is titled 'Welcome to linked-statistics.gr' and contains three sections: 'What is linked-statistics.gr?', 'Why do we need statistical data as LOD?', and 'Latest News'. The 'Latest News' section highlights a 'New Website Launched' on January 30th, 2014. On the right side, there is a 'Useful Links' section with links to 'IMIS, R.C "Athena"', 'Hellenic Statistical Authority', and 'Data Cube Vocabulary', and a 'INEY IMIS' logo.

linked-statistics.gr/index.html

Linked statistics
Publishing statistical data as Linked Open Data

About Download SPARQL Endpoint Publications Contact Us

Welcome to linked-statistics.gr

What is linked-statistics.gr?

linked-statistics.gr delivers socio-economic and socio-demographic data, made available as csv or excel files by the Hellenic Statistical Authority (ELSTAT), as [Linked Open Data \(LOD\)](#). Linked statistics provides semantically rich statistical data and connects ELSTAT to the LOD cloud. Linked statistical data facilitate their interlinking and cross-validation with datasets published by other statistical sources and public bodies, such as Eurostat, WorldBank, etc. linked-statistics.gr offers users the ability to download datasets for local use in RDF format, query via a SPARQL endpoint and browse online the available data. Additionally, it builds on top of existing open-source tools (Protégé-OWL editor and Google Refine), vocabularies (Data Cube Vocabulary, SDMX and SKOS) and LOD storage technologies (OpenLink Virtuoso) to ease the process of publishing these data as LOD.

The published data concern census data collected in the context of the Greece's Census Survey held in 2011 and provided by the Hellenic Statistical Authority. The datasets include statistical observations regarding demographic, economic, housing and household information, as well as a set of indices concerning the population over the years, such as mortality, dependency rate, total fertility rate, life expectancy at birth, etc. Future LOD datasets will cover other statistical, socio-economic and socio-demographic data. All datasets are downloaded from <http://www.statistics.gr/>.

Why do we need statistical data as LOD?

Statistical or fact-based data are maintained by statistical agencies and organizations, harvested via surveys or aggregated from other sources, stored in their databases and provided through various formats, such as excel, CSV, etc. However, most of them lack of means of interlinking the datasets between them or

INEY IMIS

Useful Links

- IMIS, R.C "Athena"
- Hellenic Statistical Authority
- Data Cube Vocabulary

Latest News

- New Website Launched**
January 30th, 2014

2014 sees the redesign of our website. Take a look around and let us know what you think.

[« Previous](#) [Next »](#)