

Implementing RDA in Wikibase

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Open Knowledge Greece

What is open knowledge?

Open knowledge is what open data becomes when it's **useful, usable and used** - not just that some data is open and can be freely used, but that it is useful – accessible, understandable, meaningful, and able to help someone solve a real problem



- any kind of knowledge can be open
- any format: spreadsheets, databases, pictures, words...
- any thematic field:
transport, science, products, education, sustainability, maps,
legislation, libraries, economics, culture, development, business,
design, finance ...

Open Knowledge Foundation: Greece a part of a global network



Oleg Lavrovsky and his sons (7 & 11 years old),
Open Knowledge Foundation Switzerland

Open Knowledge Foundation Greece

- A main goal of OKF community work in 2011 has been facilitating the creation of regionally-focused [Local Chapters and Groups](#) around the world

Greece is among the first countries to take part in this initiative



Scope of the project

- To create an entity management system that leverages linked data
 - Tool: Wikibase & new tools
 - Model: RDA
 - Output formats:
 - RDA/RDF (XML, n-triples, Notation-3, turtle)
 - MARC21
 - Access points:
 - Human (cataloguing professionals): Mediawiki interface
 - Human: RDA entity display page
 - Machine: RDA/RDF serializations
 - Machine & human: SPARQL endpoint

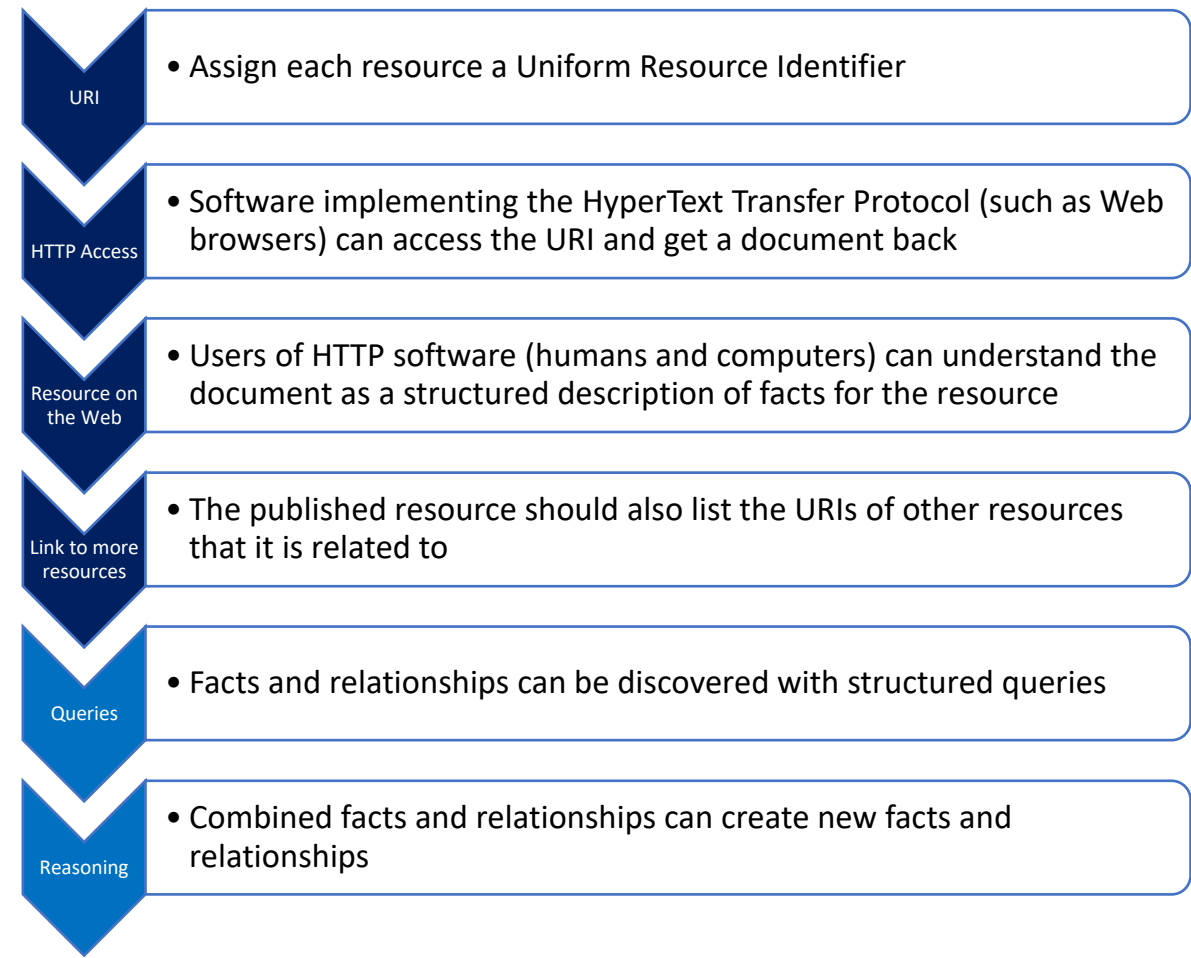
Cooperation with the NLG

- 2021
 - Mapping UNIMARC → GND
- 2022
 - Mapping MARC21 → RDA/RDF
 - Adding qualifiers for inverse mapping RDA/RDF → MARC21
 - Focus on RDA Person
- 2023
 - Further updates and upload of data
 - Other RDA entities, i.e., Nomen and Corporate Body

What we had

```
=LDR 03438cz a2200445ni 4500
=001 19445
=003 GRAtEVE
=005 20220727133926.0
=008 141009n||aczn|abn\|a\aaa\|
=016 7\saA19445$2GRAtEVE
=024 7\http://viaf.org/viaf/14771803$2viaf$al4771803
=024 7\sa00000012276806X$2isni$1https://isni.org/isni/000000012276806X
=040 \saGRAtEVE$bgre$cGRAtEVE$fnlgaf
=100 1\saΚαζαντζάκης, Νίκος,$d1883-1957
=375 \saΑρρεν
=400 1\saΚαζαντζάκης, Ν. $q(Νίκος), $d1883-1957
=400 1\saΚαζαντζάκης, Νικόλαος,$d1883-1957
=400 1\saΚαζαντζάκης, Νικόλ. $q(Νικόλαος), $d1883-1957
=400 1\saΚαζαντζάκης, Νίκ. $q(Νίκος), $d1883-1957
=400 1\saCasandsakis, Nicos,$d1883-1957
=400 1\saKazantzakis, Nikosz,$d1883-1957
=400 1\saKazandzakis, Nikos,$d1883-1957
=400 1\saKazantzakis, Nikos,$d1883-1957
=400 1\saKasantzakis, Nikos,$d1883-1957
=500 0\swnnnc$aΚάρμα Νιρβαμή,$d1883-1957$9341294
=500 1\swnnnc$aΨηλορείτης, Πέτρος,$d1883-1957$932594
=663 \saΓια έργα αυτού του συγγραφέα που έχουν γραφτεί κάτω από άλλα ονόματα, βλέπε
επίσης:$bΚάρμα Νιρβαμή, 1883-1957$bΨηλορείτης, Πέτρος, 1883-1957
=670 \saΤεκμήριο: Λήμματα τοῦ Νίκου Καζαντζάκη στό Ἐγκυκλοπαιδικόν λεξικόν
Ἐλευθερουδάκη (1927-1931), 2011:
=670 \saΤεκμήριο: Καζαντζάκη Ν. Ἀσκητική, 1962:$βσ.τ. (Ν. Καζαντζάκη)
=670 \saΤεκμήριο: Μιχάηλ Στρογκώφ, 1942:$βσ.τ. (Νικολάου Καζαντζάκη)
=670 \saΤεκμήριο: Η πλωτή πολιτεία, 1957:$βσ.τ. (Νικόλ. Καζαντζάκη)
=670 \saΤεκμήριο: Οἱ ἀφορισμένοι, 1989:$βσ.τ. (Νίκ. Καζαντζάκης καί τά ἔργα του,
χιλιασταί καί μασσῶνοι· Νικόλαος Καζαντζάκης)
=670 \saΤεκμήριο: El Capitán Mijalis, 2012:$βσ.τ. (Nicos Casandsakis)
=670 \saΤεκμήριο: Mihálistz Kapitány, 1958:$βσ.τ. (Nikosz Kazantzakis)
=670 \saΤεκμήριο: Otchet pered El' Greko, c2005:$βσ.τ. (Nikos Kazandzakis)
=670 \saLC/NACO (αρχεῖο καθιερωμένων επικεφαλίδων), ημ/νία προσέλασης 31 Ιανουαρίου
2017$b(επικεφαλίδα: Kazantzakis, Nikos, 1883-1957· παραλλαγή: Kasantzakis, Nikos, 1883-
1957)
=670 \saΤεκμήριο: Ἐγκυκλοπαίδεια Πάπυρος Λαρούς Μπριτάνικα, c1992:$βστο λήμμα
Καζαντζάκης Νίκος (Καζαντζάκης Νίκος· γεννήθηκε το 1883 και πέθανε το 1957· πεζογράφος,
συγγραφέας θεατρικών έργων, ποιητής και μεταφραστής· γιος του Μιχάηλ Καζαντζάκη και της
Μαρίας Χριστοδουλάκη· χρησιμοποίησε τα ψευδώνυμα Πέτρος Ψηλορείτης, Ακρίτας και Κάρμα
Νιρβαμή)
=856 4\shhttp://id.loc.gov/authorities/names/n79100889
=999 \s£26439
=942 \saPERSO_NAME
```

What we wanted (in six steps)



Step 1: Uniform Resource Identifier

- A. create a policy to assign unique identifiers to resources:
 - urn:nbn:gr:nlg:01-**A19445**
- B. create URIs from the URN:
 - <https://data.nlg.gr/resource/authority/A19445>

Step 2: HyperText Transfer Protocol: the request for humans (content negotiation)

1

Request URL: <https://data.nlg.gr/resource/authority/A19445>
Request Method: **GET**
Status Code: **303 See Other**

Headers

Accept: **text/html**
Accept-Encoding: gzip, deflate
Accept-Language: el
Cache-Control: no-cache
Connection: keep-alive
Host: data.nlg.gr

2

Request URL: <https://data.nlg.gr/page/authority/A19445>
Request Method: **GET**
Status Code: **200 OK**

Headers

Accept: text/html
Accept-Encoding: gzip, deflate
Accept-Language: el
Cache-Control: no-cache
Connection: keep-alive
Host: data.nlg.gr

*the response
...leads here*

*the response
...see next slide*



The response for humans (HTML)

```
<!DOCTYPE html>
<html lang="en">

<head>
  <link rel="stylesheet" href="/styles/nlg.css">
  <link rel="stylesheet" href="/styles/nlg.dark.css">
  <link rel="stylesheet" href="/styles/custom.css">
  <link rel="stylesheet" href="/styles/responsive.css">
  <meta charset="utf-8" />
  <title>Resource view: Καζαντζάκης, Νίκος, 1883-1957</title>
  <meta name="viewport" content="width=device-width, initial-scale=1">
</head>

<body>

  <main id="main-content" class="flex-container">
    <article class='main-article main-left'>
      <div class='sticker'>
```

Καζαντζάκης, Νίκος, 1883-1957
α φυσικό πρόσωπο

has date of birth 1883

has gender Άρρεν


has given name Νίκος

has date of death 1957

has surname Καζαντζάκης

description Έλληνας συγγραφέας

dateModified 2022-02-16T02:01:30.000Z

depiction 

Access Points

has access point for person

- Casandsakis, Nicos, 1883-1957
- Kasantzakis, Nikos, 1883-1957
- Kazandzakis, Nikos, 1883-1957
- Kazantzakis, Nikos, 1883-1957
- Kazantzakis, Nikos, 1883-1957
- Καζαντζάκης, Ν., 1883-1957, (Νίκος)
- Καζαντζάκης, Νίκ., 1883-1957, (Νίκος)
- Καζαντζάκης, Νικόλ., 1883-1957, (Νικόλαος)
- Καζαντζάκης, Νικόλαος, 1883-1957
- Καζαντζάκης, Νίκος, 1883-1957

has authorized access point for person Καζαντζάκης, Νίκος, 1883-1957

Relationships

has related person of person

- Ψηλορείτης, Πέτρος, 1883-1957 α φυσικό πρόσωπο
- Ψηλορείτης, Πέτρος, 1883-1957 α φυσικό πρόσωπο
- Κάρμα Νιρβαμή, 1883-1957 α φυσικό πρόσωπο

Notes

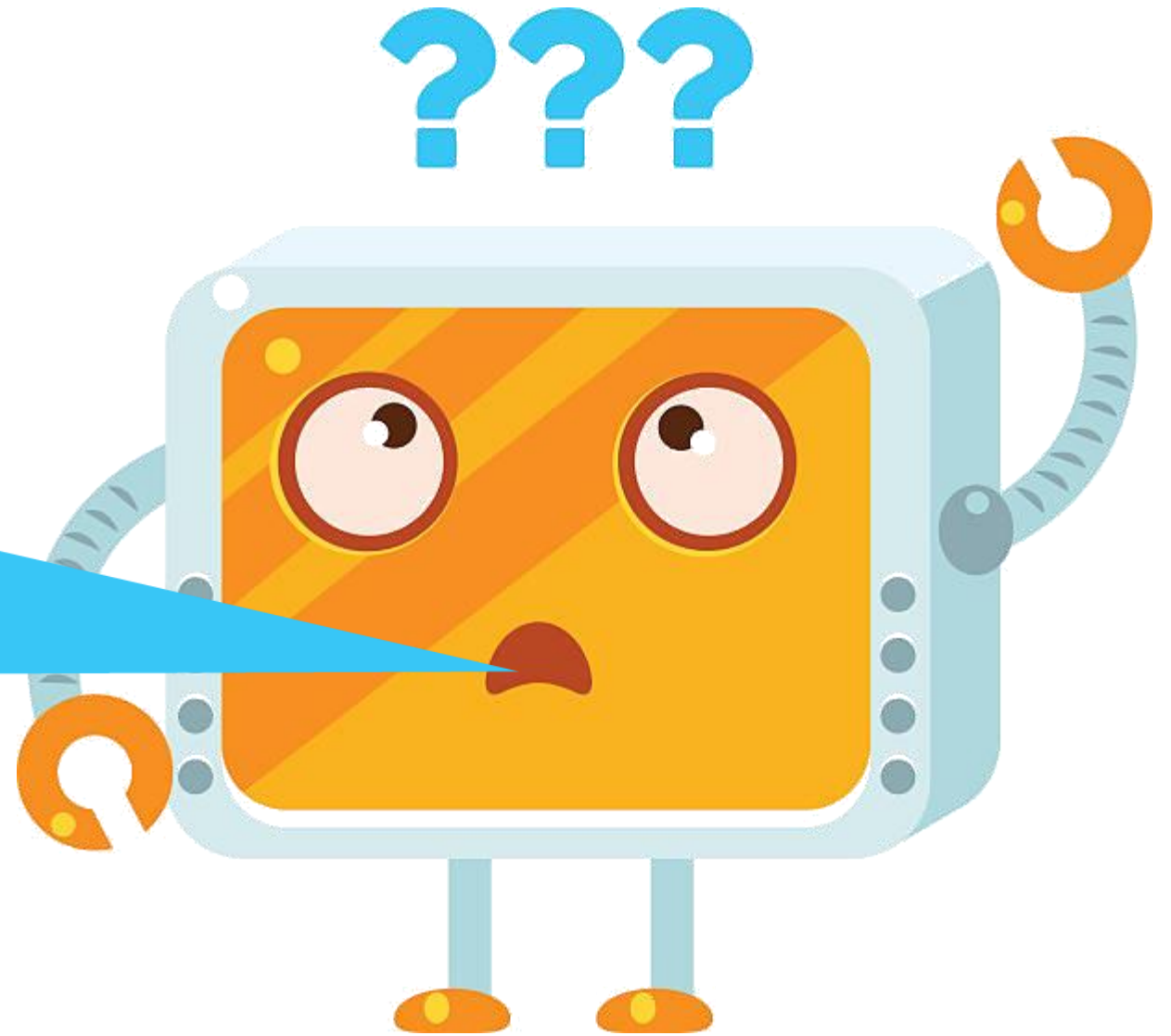
has note on person

LC (αρχείο καθιερωμένων επικεφαλίδων), ημ/νία προσπέλασης 31 Ιανουαρίου 2017, (επικεφαλίδα: Kazantzakis, Nikos, 1883-1957· παραλλαγή:

(showing some of the 1,323 lines of the response)

...as rendered by your browser

**I DON'T CARE
ABOUT
TYPOGRAPHY
AND LAYOUT.
GIVE ME SOME
PRISTINE
KNOWLEDGE!**



Step 2: HyperText Transfer Protocol: the request for computers (content negotiation)

Request URL: <https://data.nlg.gr/resource/authority/A19445>

Request Method: GET

Status Code: **200 OK**

← the response

...see next slide

Headers

Accept: **application/n-triples**

Accept-Encoding: gzip, deflate, br

Accept-Language: el

Cache-Control: no-cache

Connection: keep-alive

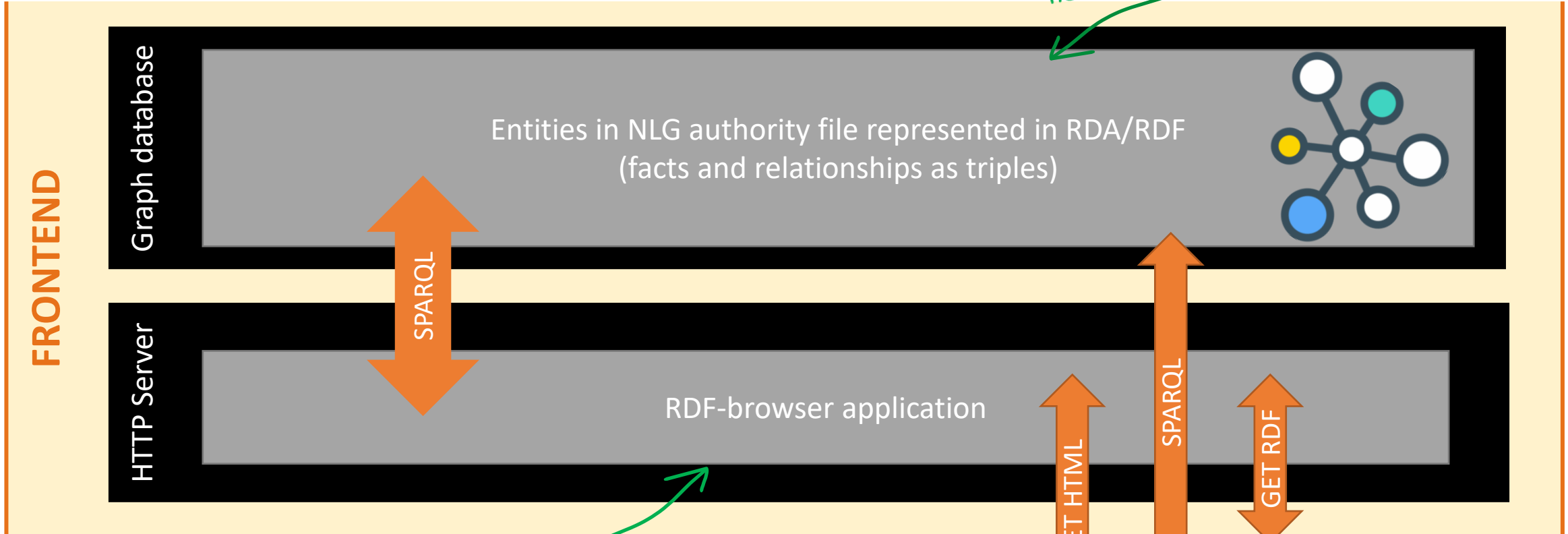
Host: data.nlg.gr

The response for computers (RDF – N-triples)

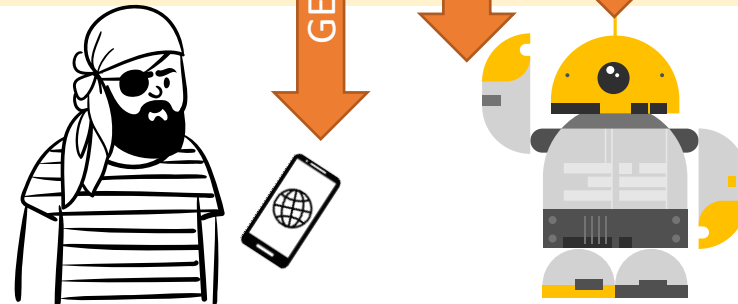
```
<http://www.w3.org/2000/01/rdf-schema#label> <http://www.w3.org/2000/01/rdf-schema#label> "label" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50121> "1883" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50116> "Άρρεν" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50292> "Νίκος" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50120> "1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50291> "Καζαντζάκης" .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "کاتب یونانی"@dv .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "Ελληνας συγγραφέας"@el .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "كاتب يوناني"@ar .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "গ্রিক লেখক"@bn .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "Greek writer"@en-ca .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "Greek writer"@en-gb .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "escritor griego"@es .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "Kreeka kirjanik"@et .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "écrivain grec"@fr .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "escritor grego"@gl .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "סופר יווני"@he .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "scriitor grec"@ro .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "shkrimtar grek"@sq .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "griechischer Schriftsteller"@de .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "гръцки писател"@bg .
<http://data.nlg.gr/resource/authority/A19445> <http://schema.org/description> "Grieks journalist"@nl .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50094> "000000012276806X" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50094> "A19445" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50377> "Casandsakis, Nicos, 1883-1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50377> "Kasantzakis, Nikos, 1883-1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50377> "Kazandzakis, Nikos, 1883-1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50377> "Kazantzakis, Nikos, 1883-1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50377> "Kazantzakis, Nikos, 1883-1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50377> "Kazantzakis, Nikos, 1883-1957" .
<http://data.nlg.gr/resource/authority/A19445> <http://rdaregistry.info/Elements/a/datatype/P50395> "LC (αρχείο καθιερωμένων επικεφαλίδων), ημ/νία προσέλασης 31 Ιανουαρίου 2017, (επικεφαλίδα: Kazantzakis, Nikos, 1883
```

Architecture (frontend)

*how did this happen?
...see next slide*



we developed this



Step 3: RDA entities as RDF resources

Act locally, think globally

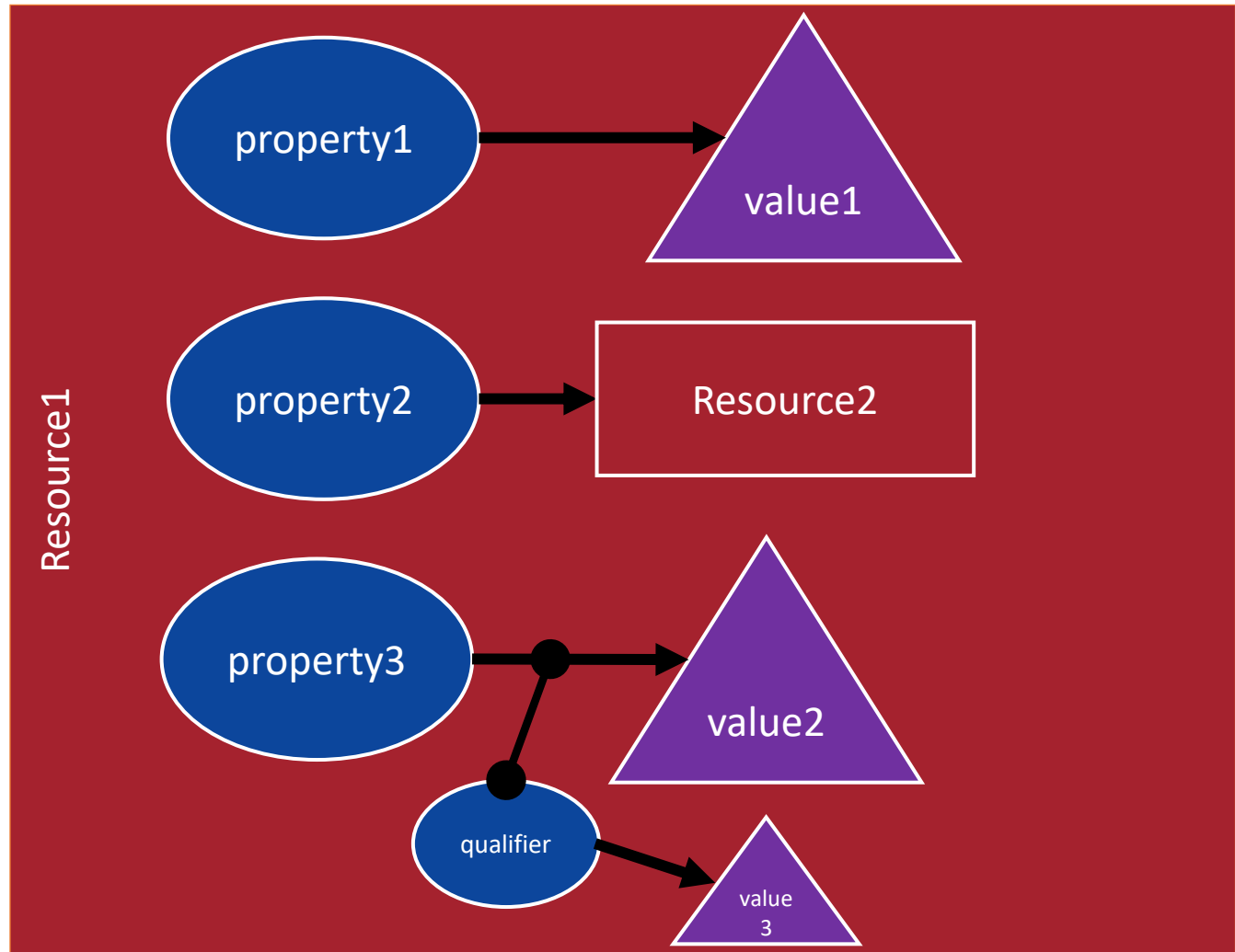
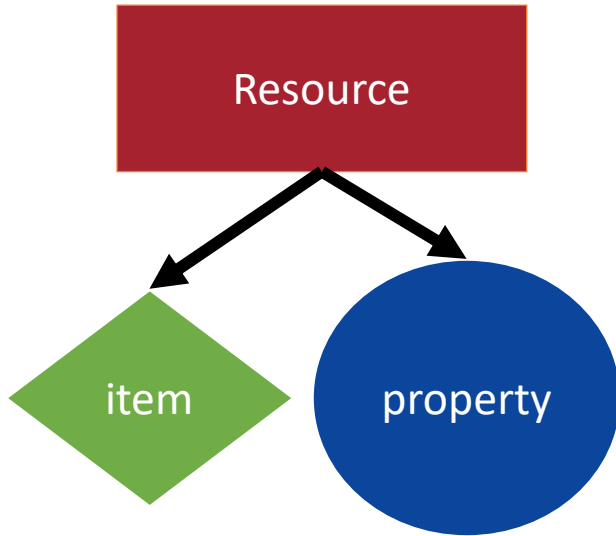
- To build a shared infrastructure for entity management
- To be used by authorized information professionals from different Greek cultural heritage institutions
- To disseminate RDA entity descriptions in RDA/RDF
- To export data in MARC21 and in other formats if needed

Step 3: RDA entities as RDF resources

Do not reinvent the wheel (Wikibase)

- Based on MediaWiki (the software powering Wikipedia)
 - collaboration
 - editing history
- Already providing a triple store and an API
 - Problem: Wikibase has its own ontology (Items, Properties, Qualifiers etc.)
 - Solution: Transform the triples and offer RDA instead

The Wikibase ontology (overly simplified)



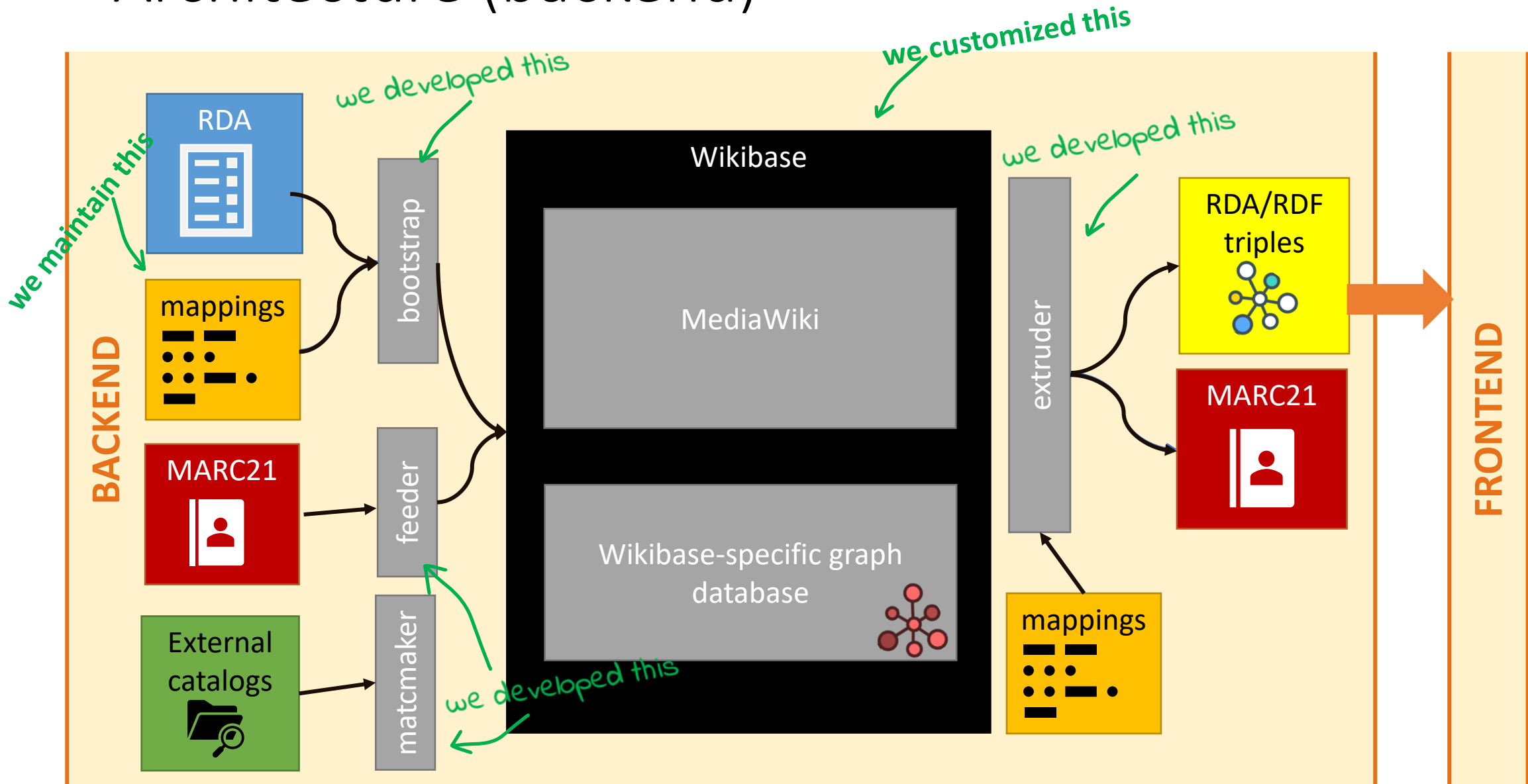
Wikibase as entity management system

1. Load the RDA ontology classes and properties into Wikibase
2. Map the MARC21 fields and subfields to RDA properties and qualifiers
3. For each NLG authority record
 - a. create an Item (assign RDA class)
 - b. for each MARC21 field & subfield create a clause with the mapped property and the value from the subfield (either literal or item, aka another RDA entity)
 - c. if needed, provide qualifier clauses

Step 4: Link to more resources

- Internal links: RDA object properties used to represent the link between authority records (Wikibase property type = item)
- External links: the authorized access point is used to discover the corresponding VIAF record and the associated Wikidata and ISNI records (Wikibase property type = text with formatter)

Architecture (backend)



Steps 5 & 6: Query and infer

<https://data.nlg.gr/query>

Query × +

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
3 SELECT * WHERE {
4   ?sub ?pred ?obj .
5 } LIMIT 10
```

Table Response 10 results in 0.058 seconds

sub	pred	obj
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"έργο"@el
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"work"@en
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"Obra"@es
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"teos"@fi
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"œuvre"@fr
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"mű"@hu
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"opera"@it
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"werk"@nl
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"verk"@no
<http://rdaregistry.info/Elements/c/C10001>	rdfs:label	"Verk"@sv

Showing 1 to 10 of 10 entries

Simple view Ellipse Filter query results Page size: 50

< 1 >



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