

kadaster



Lexl Rowland | 07-11-2023

A Pragmatic Example for Linked Data: The Kadaster Knowledge Graph

The Kadaster Data Science Team

Website: labs.kadaster.nl

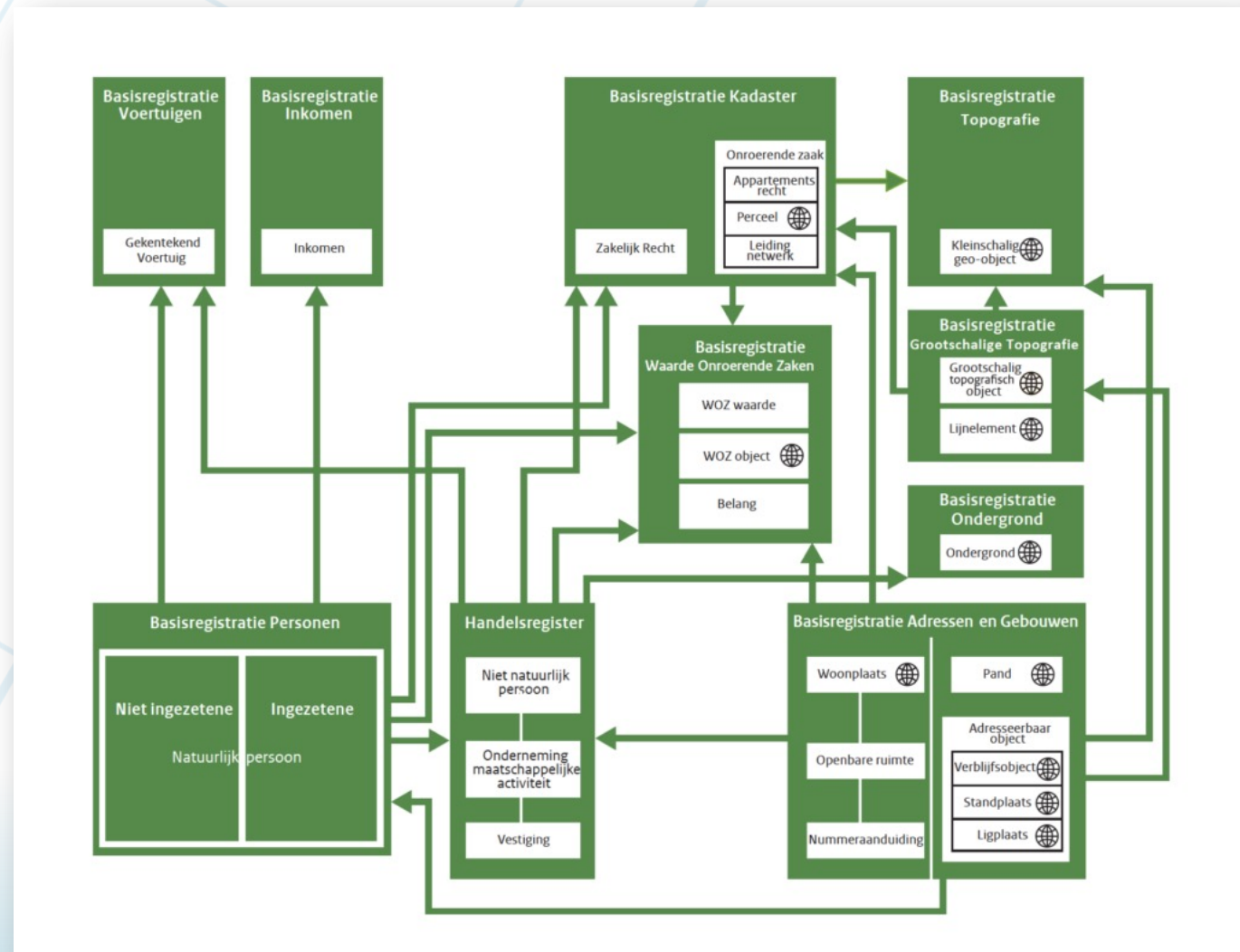
The screenshot shows the Kadaster Labs website interface. At the top left is the Kadaster logo. To its right are navigation links: Datasets, Dissemination, Internships, and Developer. Further right are links for Status, Toegankelijkheid, and Over ons. Below the navigation is a decorative banner with a blue background and a pattern of binary code (0s and 1s). The main content area starts with the heading "Kadaster Labs" followed by a paragraph of text. Below this is a section titled "Thema's" which contains six cards: "Innovatie" (with an image of hands), "Knowledge Graph" (with a network diagram), "Data Analyse" (with a map), "Studenten" (with a map), "Browsers" (with a map), and "Linked Data" (with a map).

Kadaster: Dutch Land Registry and Mapping Agency

Role: National agency tasked with the publication and maintenance of several key registers.

SDI developments in the Netherlands are all strongly related to the key registers (basisregistraties) of e-government policy.

Organisation is based on an interrelated (although not automatically connected system)



The Kadaster Maintains...

- BRK: Key Register Kadaster
- BRT: Key Register Topography
- BAG-LV: Key Register Addresses and Buildings
- BGT-LV: Key Register Largescale Topography
- RO-LV: Spatial Planning*
- WOZ-LV: Real Estate Valuation
- WKPB-LV: Public Law Restrictions*
- LV-Energielabels*
- KLIC: Cables and Pipelines

LV = Landelijke Voorziening

* = Geen wettelijke basisregistratie

En we koppelen met BRP, RNI, Handelsregister



Kadaster Ambitions



Providing certainty of ownership and use of anything above and below the surface



Offering a platform for anyone to handle spatial information anywhere and anytime



Supporting society in using spatial information to solve issues that matter

Challenges

- Services are standardised for the geospatial world (naturally)
- Copying of data for transformation/applications
- Less certainty in our data (completeness, quality etc.) and, therefore, less reuse in other social contexts

Why Linked Data?

In order to achieve our organisational ambitions, we need to:

- Provide the semantics of our data so that there is a **shared understanding** of what our data means
- Ensure that **the provenance** of our data is clear to users
- Provide information about how our data should be used, where we have made calculations or combined data (**provide metadata**)

Our data should, therefore, be:

- Findable, accessible, interoperable and reusable (FAIR)
- 5-star data

= Linked Data and Semantic Web

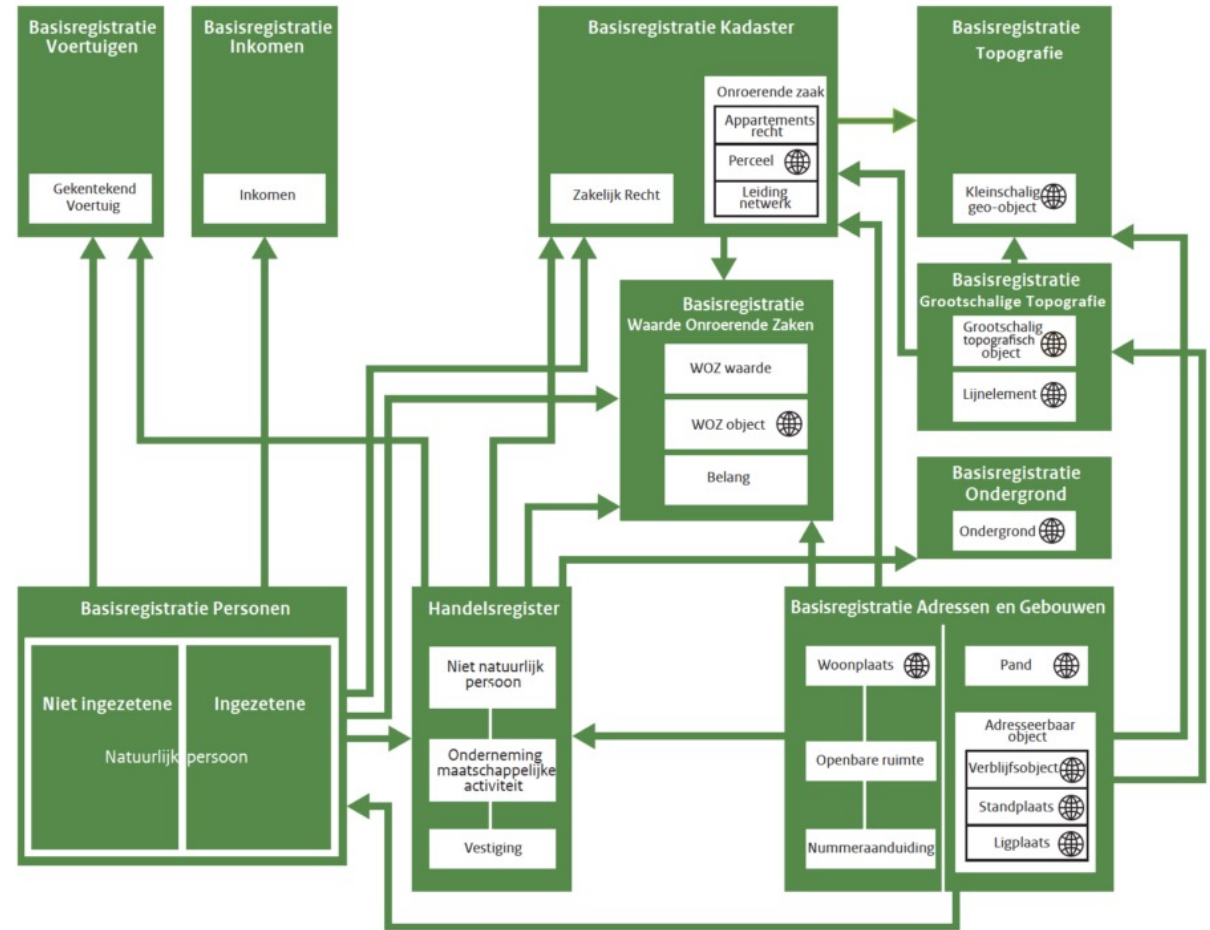
From Data Siloes to Linked Data

Data siloes are a consequence of needing to organise information.

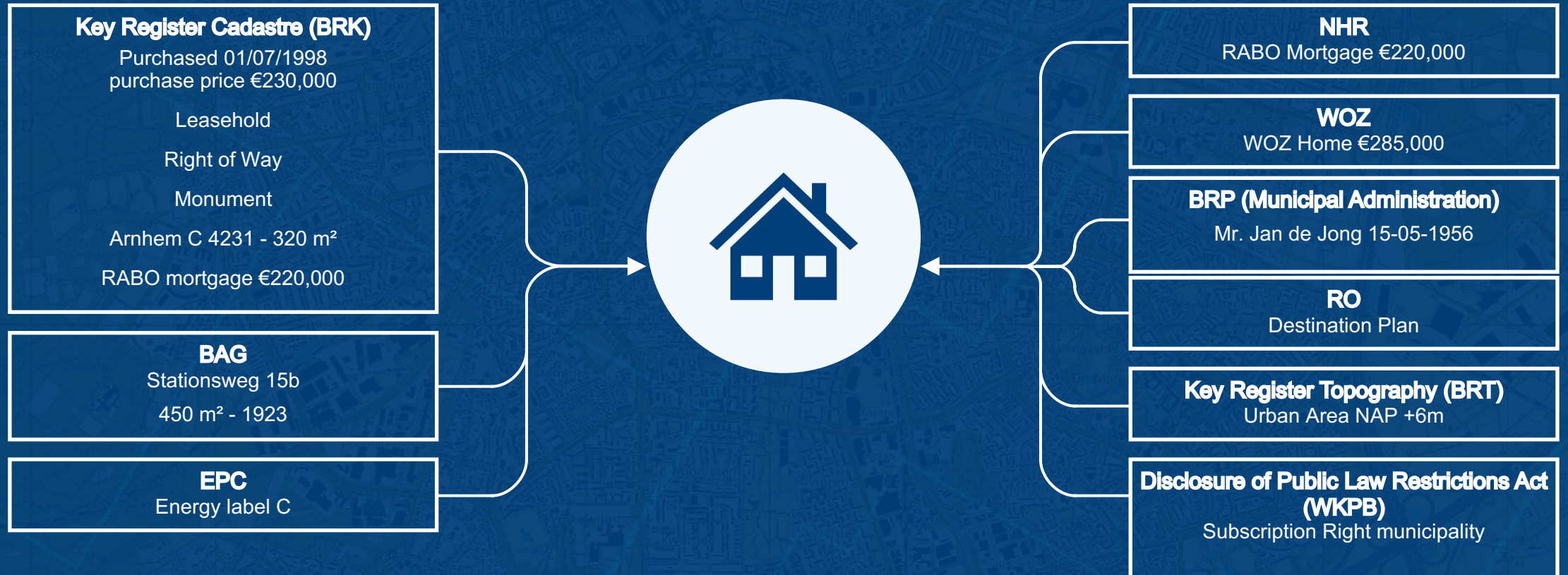
More certainty and more reuse calls for integration and ease of use.

This integration needs to be explicitly modelled, published and easy to use.

These principles are at the core of our linked data implementation.



Data per Key Register



What do we want?

I want to buy a **palace** with a **surface area of >1500m²** which is a **national monument** and has a value of > **Euro 1,000,000** in the neighborhood of **'Berg en Bos' in Apeldoorn.**

BAG

BRT

RCE

CBS

WOZ

We want integrated geospatial data

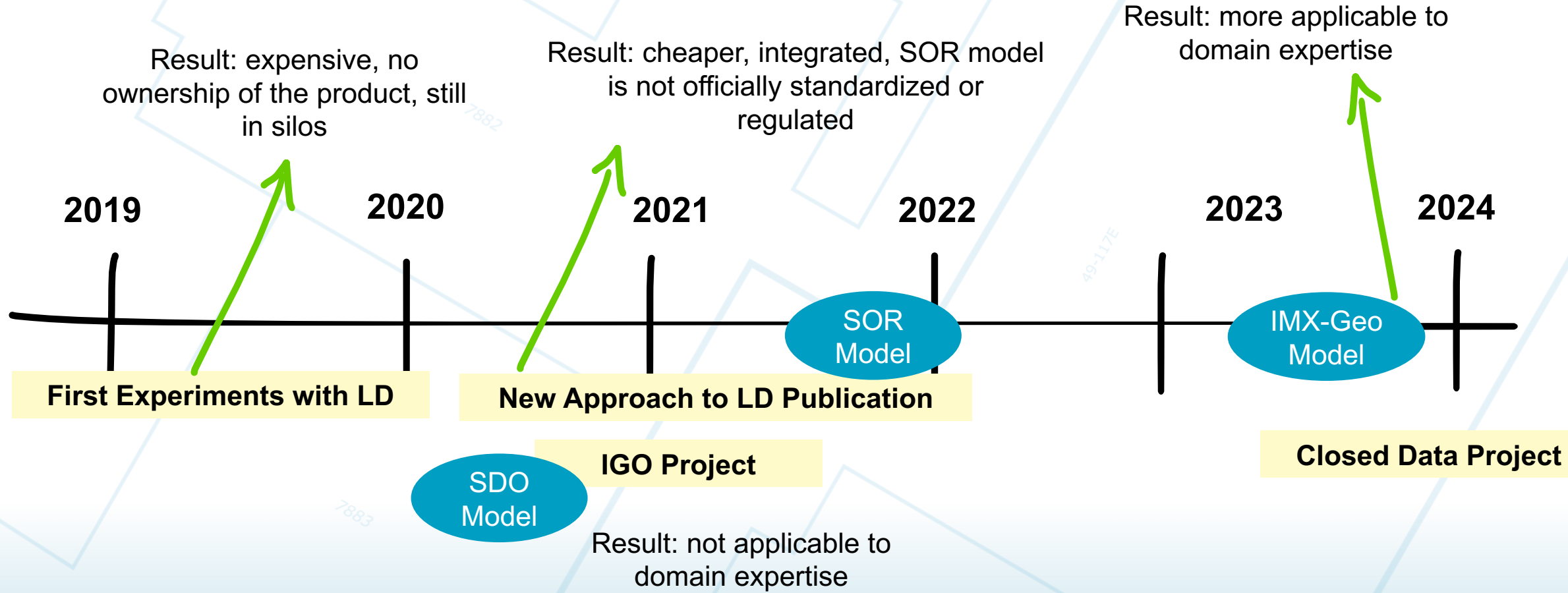
Kadaster Knowledge Graph Contains...

- BRK: Key Register Cadastre
- BRT: Key Register Topography
- BAG-LV: Key Register Addresses and Buildings
- RO-LV: Spatial Planning*
- WOZ-LV: Real Estate Valuation
- BGT-LV: Key Register Large-Scale Topography
- WKPB-LV: Public Law Restrictions *
- KLIC: Cables en Pipelines

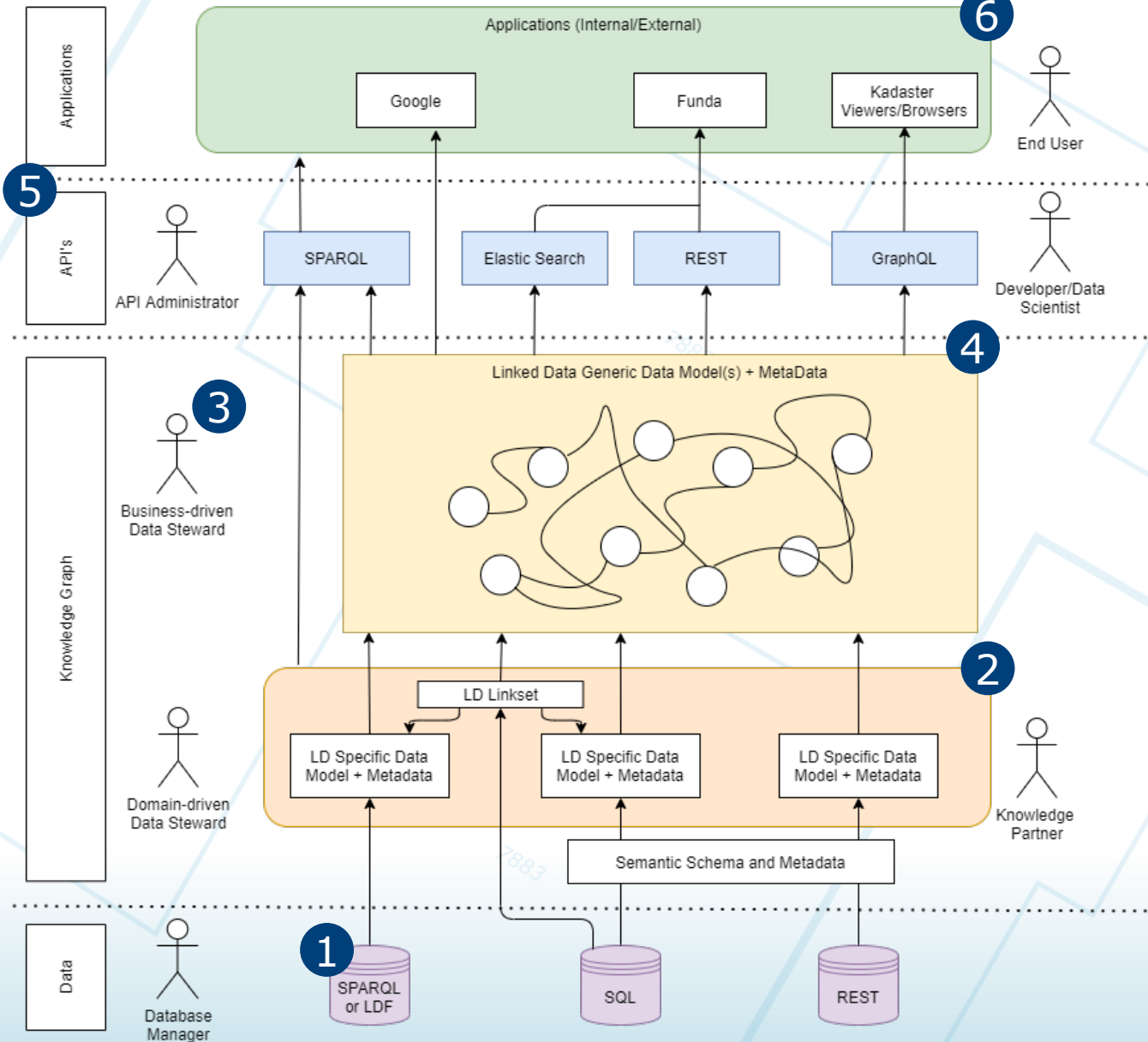


Kadaster Knowledge Graph Timeline

Timeline:



Architectuurvisie



- 1 The siloed registration level datasets are available in a variety of formats, including their Linked Data silos.
- 2 The siloed Linked data is itself useable for domain experts and offers the basis for different views on the data
- 3 Business experts will eventually determine the format of this knowledge Graph (e.g. Geonovum) so that it matches the user's wishes.
- 4 By means of one or more Knowledge Graphs (Views) about the data, we offer a set of data that is as useful and easy as possible.
- 5 We offer a variety of different interaction options with the necessary resources to put them to good use.
- 6 Applications from within and outside the government can make use of the data foundation.

Applications using the KKG

- Loki: Chatbot
- Query Builder: Lowthreshold Querying
- ObjectViewer: Interacting with geospatial data
- Augmented Reality Application
- Data stories
- ...

Use cases

De Kadaster Knowledge Graph wordt gebruikt in een toenemend aantal use cases, waarmee gegevens op een nieuwe manier gekoppeld, bevroegd, en inzichtelijk gemaakt worden.



Demonstrator

Querybuilder

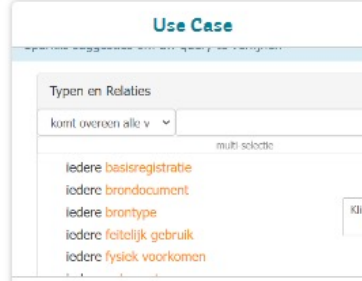
Maak je eigen SparQL queries op de KKG-Light



Demonstrator

Objectviewer

Zoek zelf in de objectviewer op locatie. De informatie is afkomstig uit de knowledge graph.



Use Case

Typen en Relaties

komt overeen alle v

- iedere **basisregistratie**
- iedere **brondocument**
- iedere **brontype**
- iedere **feitelijk gebruik**
- iedere **fysiek voorkomen**

Sparklis

Introductie en voorbeeldvragen van Sparklis.



Demonstrator

BAG
<https://data.pldn.nl/d672e/id/11>

Geo Data Visitor

Een applicatie om de visualisatie van externe datasets op de kaart mogelijk te maken nadat deze zijn verrijkt door de geodatawizzard



Demonstrator

AR Applicatie

Een AR applicatie waarmee gebruikers op een laagdrempelige manier toegang hebben tot en interactie hebben met Kadastergegevens.




Demonstrator

Gruff

Een applicatie waarmee u de knowledge graph van Kadaster kunt visualiseren en doorbladeren



Ruimtelijke ordening



Nutsbedrijven



Openbare orde en veiligheid

Augmented Reality Application

Goal: Support the interoperability between distributed data sources and end-user applications, allowing users to interact (in a low threshold manner) with authoritative data published by the organisation



API GET: <https://api.labs.kadaster.nl/queries/dst/ar-demo-data-voor-plaats/run?>

Variables +

vbold
0003010000129471

View populated query

```
1 PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
2 PREFIX dct: <http://purl.org/dc/terms/>
3 PREFIX sdo: <https://schema.org/>
4 PREFIX brt_def: <http://brt.basisregistraties.overheid.nl/def/top10n1
5 PREFIX kad: <https://data.kkg.kadaster.nl/kad/model/def/>
6 PREFIX geo: <http://www.opengis.net/ont/geosparql#>
7 PREFIX sdo0: <http://schema.org/> #error in CBS data
8 PREFIX sor: <https://data.kkg.kadaster.nl/sor/model/def/>
9 PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
10 prefix time: <http://www.w3.org/2006/time#>
11 PREFIX wbk: <https://data.labs.kadaster.nl/cbs/wbk/vocab/>
12 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
13 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
14 SELECT DISTINCT ?gebouwNaam ?buurtNaam ?buurtID ?gemeenteNaam ?gemeen
bouwjaar ?gebruiksdoel ?basisschoolAfstand ?treinstationAfstand ?perce
bind(iri(concat('https://data.kkg.kadaster.nl/id/verblijfsobject/',
?vbo
17 a sor:Verblijfsobject;
18 sor:gebruiksdoel/skos:prefLabel ?gebruiksdoel;
19 sor:maaktDeelUitVan ?gebouw;
20 sor:hoofdadres ?nummeraanduiding;
21 sor:oppervlakte ?vloerOppervlakte0 .
22 ?gebouw
23 a sor:Gebouw;
```

Adres
't Spiker 24
7231JT

woonfunctie

Bouwjaar: 1976

Vloer Oppervlakte: 394 m2

Perceel Oppervlakte: 530 m2

Gemeente: Zutphen

Buurt: Dorp Warnsveld

Aantal basisscholen binnen 3km: 12

Afstand treinstation: 2.7 km

Meer informatie

Klopt er iets niet?