



## JOINING UP GOVERNMENTS

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**CORE**  
BUSINESS  
VOCABULARY

# Case Study

How to describe Organizations in RDF  
using the Core Business Vocabulary  
and the Organization Ontology?

## Introduction

This case study is a follow-up to the Business Case on interconnecting business registers using the Core Business Vocabulary [1]. This document explains how organizations can be described in RDF using the Core Business Vocabulary and the Organization Ontology. To do this, it provides an example of a real organization, PricewaterhouseCoopers Enterprise Advisory a legal entity registered in the Belgian company register, which is then described in RDF using these specifications.


A Core Vocabulary is a simplified, reusable, and extensible data model that captures the fundamental characteristics of a data entity in a context-neutral fashion. Core Vocabularies can be used in interoperability agreements for enabling information systems, developed independently, to exchange information, thus making it possible for information to travel across borders and domains.

The first three Core Vocabularies [2] developed by the Interoperability Solutions for European Public Administrations (ISA) of the European Commission [3] (the Core Person, Core Location and Core Business) have been undertaken by the Government Linked Data Working Group (GLD WG) of W3C [3].

The Core Vocabularies can be used in conjunction with other ontologies and vocabularies. For example, the Core Business Vocabulary can be combined with the more general Organization Ontology. Whereas the Core Business Vocabulary should be used for describing Registered Legal Organizations (RegORG)\* [5], the Organization Ontology (ORG) [6] should be used to describe the several parts of an organization.

\*In order to better align the Core Business Vocabulary with the Organization Ontology, the GLD WG has recently renamed it to 'Registered Organization Vocabulary' (RegORG).

“The Core Business Vocabulary can be combined with the more general Organization Ontology. The Core Business Vocabulary can be used for describing Registered Legal Organizations (RegORG), the Organization Ontology (ORG) to describe the several parts of an organization.”

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- [1] [https://joinup.ec.europa.eu/community/core\\_vocabularies/description](https://joinup.ec.europa.eu/community/core_vocabularies/description)
  - [2] [https://joinup.ec.europa.eu/community/core\\_vocabularies/description](https://joinup.ec.europa.eu/community/core_vocabularies/description)
  - [3] <http://ec.europa.eu/isa/>
  - [4] <http://www.w3.org/2011/gld/>
  - [5] <http://dvcs.w3.org/hg/gld/raw-file/default/legal/index.html>
  - [6] <http://www.w3.org/TR/vocab-org/>

## What is the Core Business Vocabulary?

The Core Business Vocabulary is a vocabulary for describing organizations that have gained legal entity status through a formal registration process, typically in a national or regional register. This data model captures the fundamental characteristics of a legal entity, e.g. its legal name, its registered activities and address. These same attributes can be used to describe private and governmental organizations.

The Core Business Vocabulary was first developed by the ISA Programme in cooperation with DG MARKT of the European Commission. This Directorate General is responsible for the EC legislative proposal on interconnecting National Business Registers. The Core Business Vocabulary Working Group was chaired by Piotr Madziar from DG MARKT/F2. Other members of the Working Group were affiliated with XBRL Europe, opencorporates.com, the European Business Register and the European Banking Authority EBA.

## What is the ORG Ontology?

The ORG Ontology is designed to enable publication of information on organizations and organizational structures including governmental organizations. It is intended to provide a generic, reusable core ontology that can be extended or specialized for use in particular situations. The ORG Ontology has been used by the UK Government for describing public organizations.

“The Core Business Vocabulary is a simplified, reusable and extensible data model to describe organizations that have gained legal entity status through a formal registration process.”

## Both Vocabularies abide by the Linked Data principles



They promote the use of common identifiers for organizations in the form of URIs.

They can be easily combined with other Linked Data vocabularies.

They can easily be extended with new classes and attributes to fulfil new domain requirements.

## Why using both Vocabularies?

The Core Business Vocabulary enables anyone to describe the essential elements of a registered organization. These data fields are typically shown in the official extracts of business registers (A):

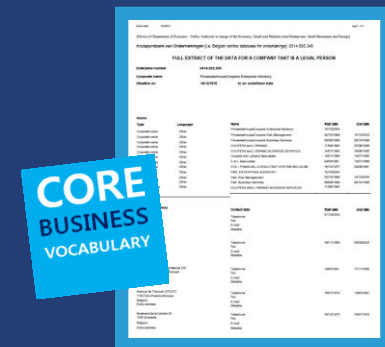
- the legal name of the organization
- the registered number of the organization
- the legal address of the organization
- the activities for which the organization is registered for
- the type of organization

Each organization is identified by a unique URI, which is aligned with the new directive [2012/17/EU](#) [7]\*.

The ORG Ontology is more generic and makes it possible to describe organizational structures using RDF. These are typically described in organizational charts (B) :

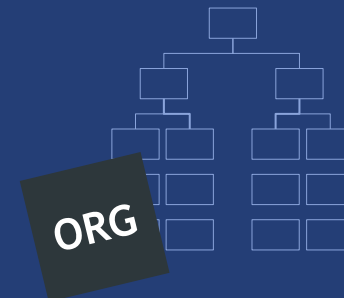
- the organization's purpose
- the organizational decomposition of an organization
- the people who are members of the organization at each one of its levels

(A) Extract from a business register



The image shows a screenshot of a business register extract. A blue box labeled 'CORE BUSINESS VOCABULARY' is overlaid on the top left of the document. The document contains a table with columns for 'Name', 'Legal form', 'Registered office', 'Business activity', 'Date of registration', and 'Status'. The text is in German, and the table lists various companies and their details.

(B) Organizational Chart



\*According to the new directive 2012/17/EU: "Member States shall ensure that companies have a unique identifier allowing them to be unequivocally identified in communication between registers through the system of interconnection of central, commercial and companies registers established in accordance with Article 4a(2) ("the system of interconnection of registers"). That unique identifier shall comprise, at least, elements making it possible to identify the Member State of the register, the domestic register of origin and the company number in that register and, where appropriate, features to avoid identification errors."

[7] [http://eur-lex.europa.eu/smartapi/cgi/sga\\_doc?smartapi!celexplus!prod!CELEXnumdoc&lq=EN&numdoc=32012L0017](http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!CELEXnumdoc&lq=EN&numdoc=32012L0017)

## Description of the legal entity

PricewaterhouseCoopers Enterprise Advisory is a registered legal entity in the Belgian company register (Kruispuntbank van Ondernemingen – Banque-Carrefour des Entreprises). This example shows how the company can be described in RDF using the Core Business Vocabulary. The data was extracted from the Belgian company register.



Extract of PricewaterhouseCoopers Enterprise Advisory data registered as legal entity in the Belgian company register

### Legal name

```
<rov:RegisteredOrganization
rdf:about="http://kbopub.economie.fgov.be/kbopub/toonondernemingps.html?ondernemi
n&#xD:&#xA:rgsnummer=415622333">
<rov:legalName>PricewaterhouseCoopers Enterprise Advisory</rov:legalName>
</rov:RegisteredOrganization>
```

### Registered number

```
<rov:registration>
<adms:Identifier rdf:about="http://example.com/Reg415622333">
<skos:notation>0415.622.333</skos:notation>
<adms:schemeAgency>Belgian Base Register for Companies</adms:schemeAgency>
</adms:Identifier>
</rov:registration>
```

### Legal address

```
<rov:registeredAddress>
<locn:Address rdf:about="http://example.com/ra415622333">
<locn:postCode>1932 Zaventem</locn:postCode>
<locn:fullAddress>Belgium, Woluwedal 18</locn:fullAddress>
</locn:Address>
</rov:registeredAddress>
```

### Type

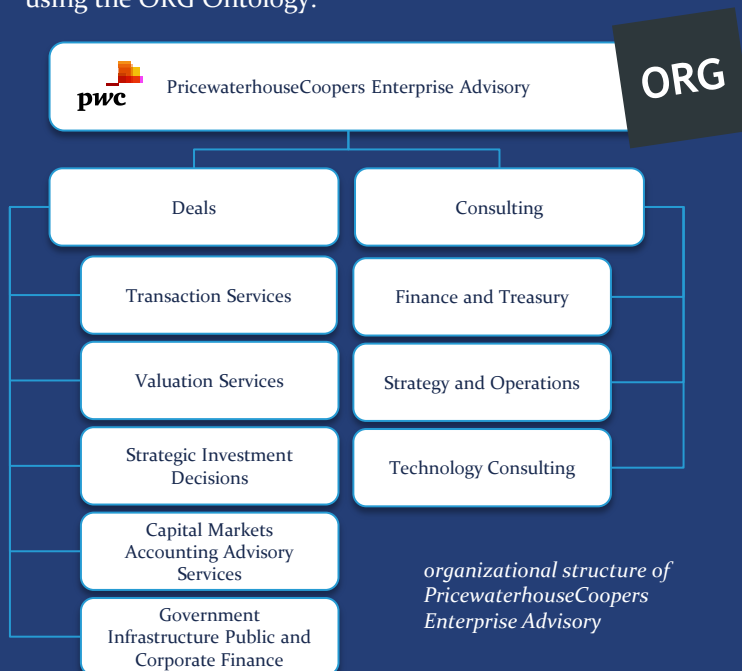
```
<rov:companyType>
<skos:Concept rdf:about="http://example.com/Cooperatievevennootschap">
<rdfs:label>Coöperatieve vennootschap</rdfs:label>
</skos:Concept>
</rov:companyType>
```

### Activities for which the company is registered for

```
<skos:Concept rdf:about="http://example.com/ca7022">
<rdfs:label>Business and other management consultancy activities</rdfs:label>
</skos:Concept>
<skos:Concept rdf:about="http://example.com/ca74142">
<rdfs:label>Other business and management consultancy activities</rdfs:label>
</skos:Concept>
```

## Description of the organizational structure

PricewaterhouseCoopers Enterprise Advisory is divided into 'Consulting' and 'Deals' practices. Each practice is composed of different units. This example provides a description of the organizational structure (and other additional information) of PricewaterhouseCoopers Enterprise Advisory in RDF using the ORG Ontology.



### Organizational decomposition

```

<org:Organization rdf:ID="Consulting">
<rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Consulting</rdfs:label>
<org:hasSubOrganization>
<org:Organization rdf:ID="Finance_and_Treasury"/>
</org:hasSubOrganization>
<org:hasSubOrganization>
<org:Organization rdf:ID="Technology_Consulting"/>
</org:hasSubOrganization>
<org:hasSubOrganization>
<org:Organization rdf:ID="Strategy_and_Operations"/>
</org:hasSubOrganization>
  
```

### Purpose

```

<org:purpose>
<rdfs:Resource rdf:ID="For_profit"/>
</org:purpose>
  
```

### Members

```

<org:hasMember rdf:resource="http://www.linkedin.com/in/joaofrade"/>
  
```

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Example: Description  
of the legal entity

Example: Description of the  
organizational structure

Pilot in Greece

References

## Piloting the Core Business Vocabulary in Greece

The International Hellenic University has used the Core Business Vocabulary for publishing some 28000 companies registered in the Greek Tax Authorities business registry as linked data\* [8,9].

The pilot deals only with non-confidential data, e.g. name, company type and activity, and address.

Well-structured, dereferencable URIs were designed in order to assign to each legal entity a unique Web identifier. Currently, all legal entities are assigned URIs of the following structure `http://linkeddata.ihu.edu.gr/resource/company/{afm}`, where `afm` is the unique identifier of a legal entity maintained by the tax authorities.

The example of the pilot can be used by other countries that decide to publish their company data as linked open data.

To browse the data served by the pilot, you may visit `http://linkeddata.ihu.edu.gr:8080/rdf-browser/`  
For the time being the main part of the website is only available in Greek but the procedure applied is described in English.

\* Linked data is a promising method of publishing structured, machine-readable data on the Web so that it can be inter-connected, thus enriching its meaning and crowd-sourcing improvements in quality. In this case, core business information has been linked to the location of companies with the goal to enable reuse in third party services and applications where core business data may be required.



## Lessons Learnt

The Core Business Vocabulary can be used for representing basic company data. Case-specific peculiarities call for additional modelling effort. The flexibility of RDF minimises this effort.

An authoritative source, e.g. a company register, should be responsible for assigning and maintaining good URIs for companies.

Reference data, such as taxonomies of company types, statuses and activities, has to be published as linked open data so that people avoid re-inventing the wheel.

Publishing multi-lingual linked open data entails a number of technical challenges.

[8] [http://ec.europa.eu/isa/news/2012/opendata\\_greece\\_en.htm](http://ec.europa.eu/isa/news/2012/opendata_greece_en.htm)

[9] [https://joinup.ec.europa.eu/asset/core\\_business/news/core-business-and-core-location-vocabularies-piloted-greece](https://joinup.ec.europa.eu/asset/core_business/news/core-business-and-core-location-vocabularies-piloted-greece)

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## Contact us

<https://joinup.ec.europa.eu/contact>

## References

An organization ontology (ORG)

<http://www.w3.org/TR/vocab-org/>

Registered Organization Vocabulary (RegOrg)

<http://dvcs.w3.org/hg/gld/raw-file/default/legal/index.html>

Business Case: Interconnecting business registers with the Core Business Vocabulary

[https://joinup.ec.europa.eu/asset/core\\_business/document/interconnecting-business-registers-core-business-vocabulary](https://joinup.ec.europa.eu/asset/core_business/document/interconnecting-business-registers-core-business-vocabulary)

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