



CENTROALGORITMI

Artefactos Linked Open Data para utilização no âmbito dos catálogos de dados abertos

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Conteúdos

- Contextualização LOD
- Contextualização UC de Web Semântica
- PA de Centros de investigação
- VC da FCT em SKOS
- VC da UE em SKOS
- Trabalho em curso



Open

“Open data and content can be freely used, modified, and shared by anyone for any purpose” - The Open Definition



OPEN KNOWLEDGE

SEE HOW DATA CAN CHANGE THE WORLD

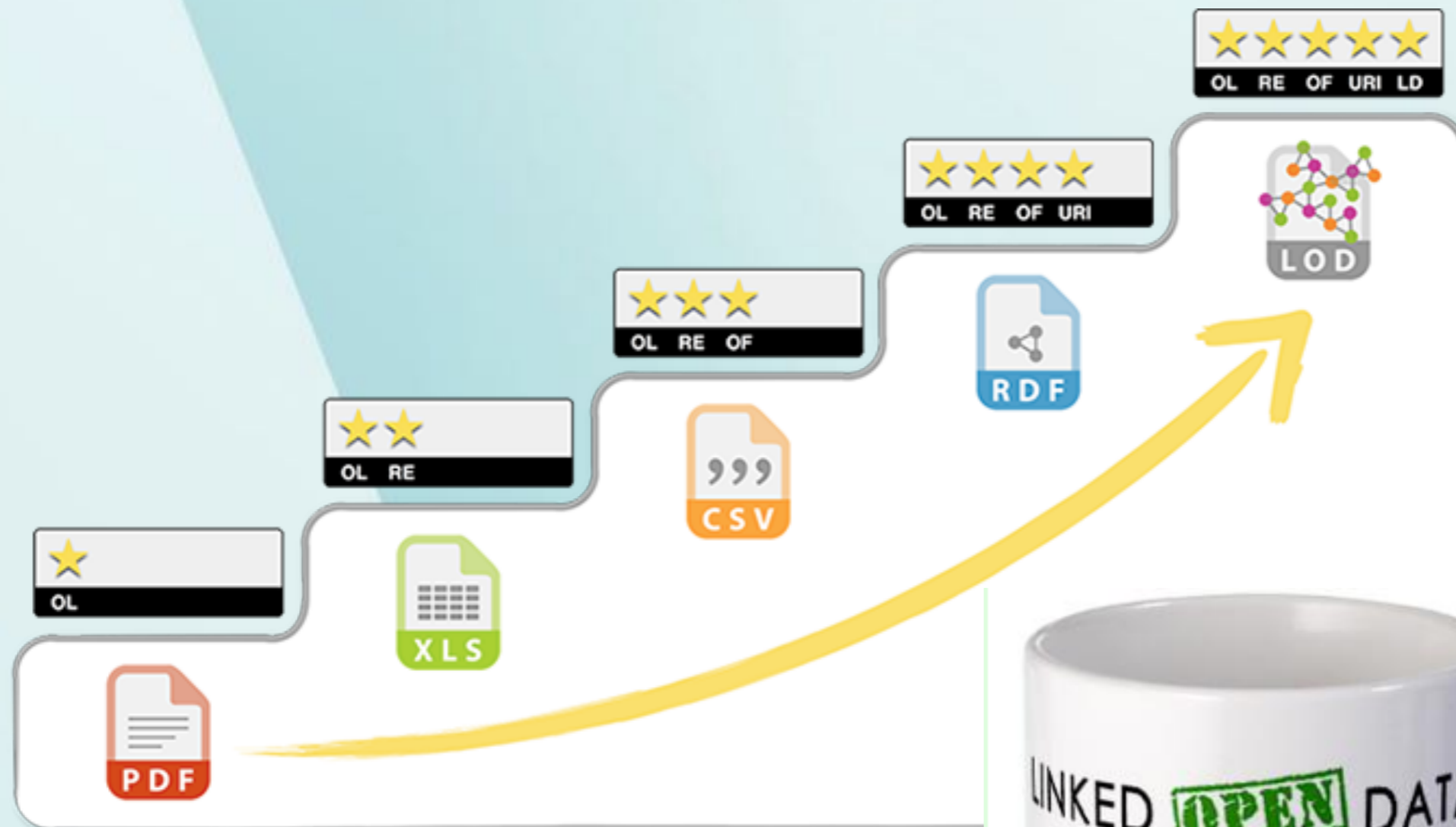
A world where knowledge creates power for the many, not the few.

A world where data frees us — to make informed choices about how we live, what we buy and who gets our vote.

A world where information and insights are accessible — and apparent — to everyone.

This is the world we choose.

Source: <https://okfn.org/>





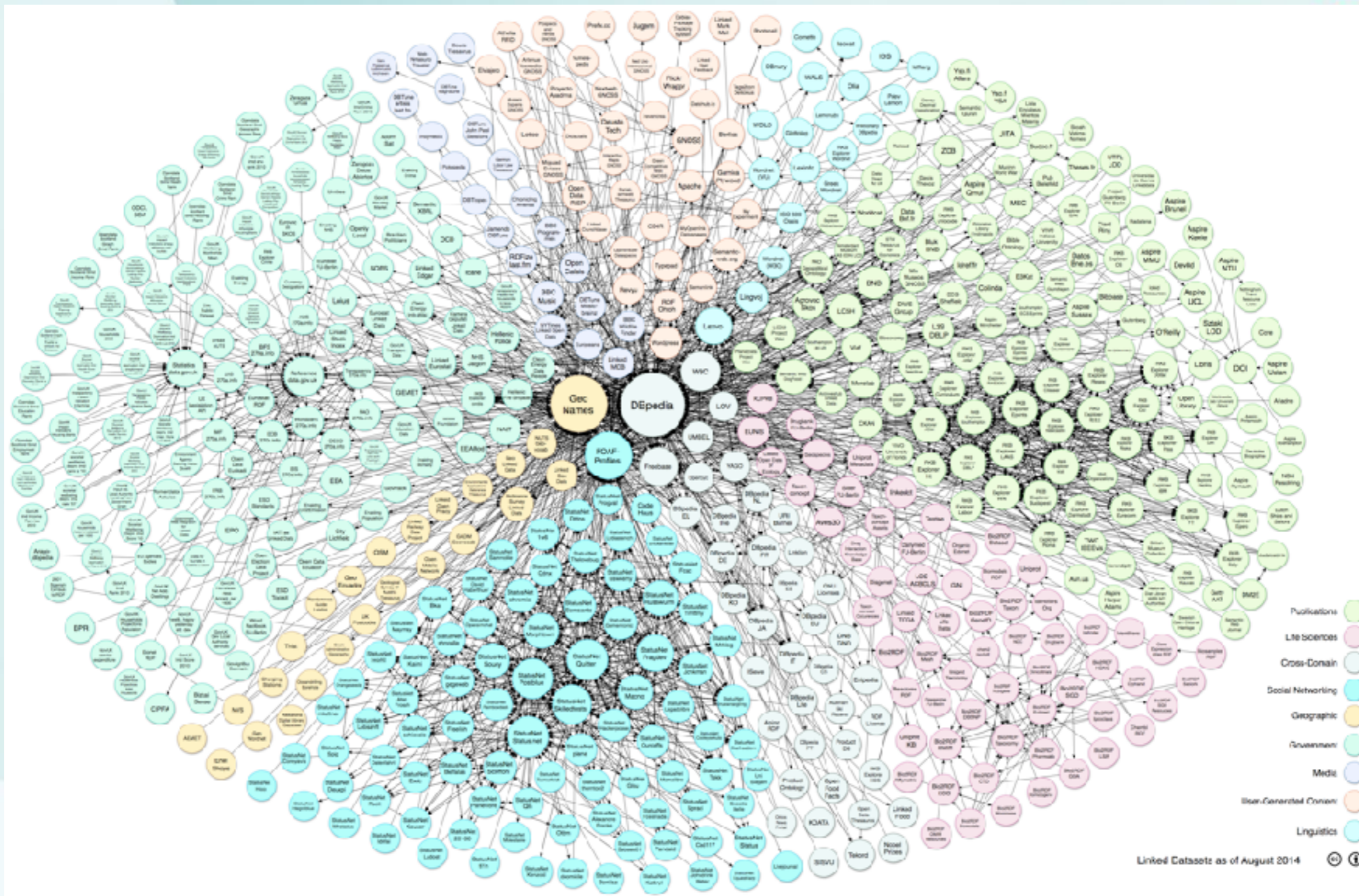
?

Nome	Meio	Distância	Tempo
Maria Silva	pé	4500	70
João Fernandes	automóvel	10000	10
Rita Vieira	bicicleta	3300	20

?

?

?



Linked Datasets as of August 2014



METADATA
Dublin Core® Metadata Initiative
INNOVATION

Home Metadata Basics

Enter keyword Search

The Singapore Framework for Dublin Core Application Profiles

Data on the Web Best Practices

W3C Recommendation 31 January 2017



Shape Expressions (ShEx) Primer

Draft Community Group Report 29 March 2017



METADATA
Dublin Core® Metadata Initiative
INNOVATION

Home Metadata Basics

Enter keyword Search

DCMI Metadata Terms



SKOS Simple Knowledge Organization System Primer

W3C Working Group Note 18 August 2009



RDF 1.1 Primer

W3C Working Group Note 25 Feb

FOAF Vocabulary Specification 0.99

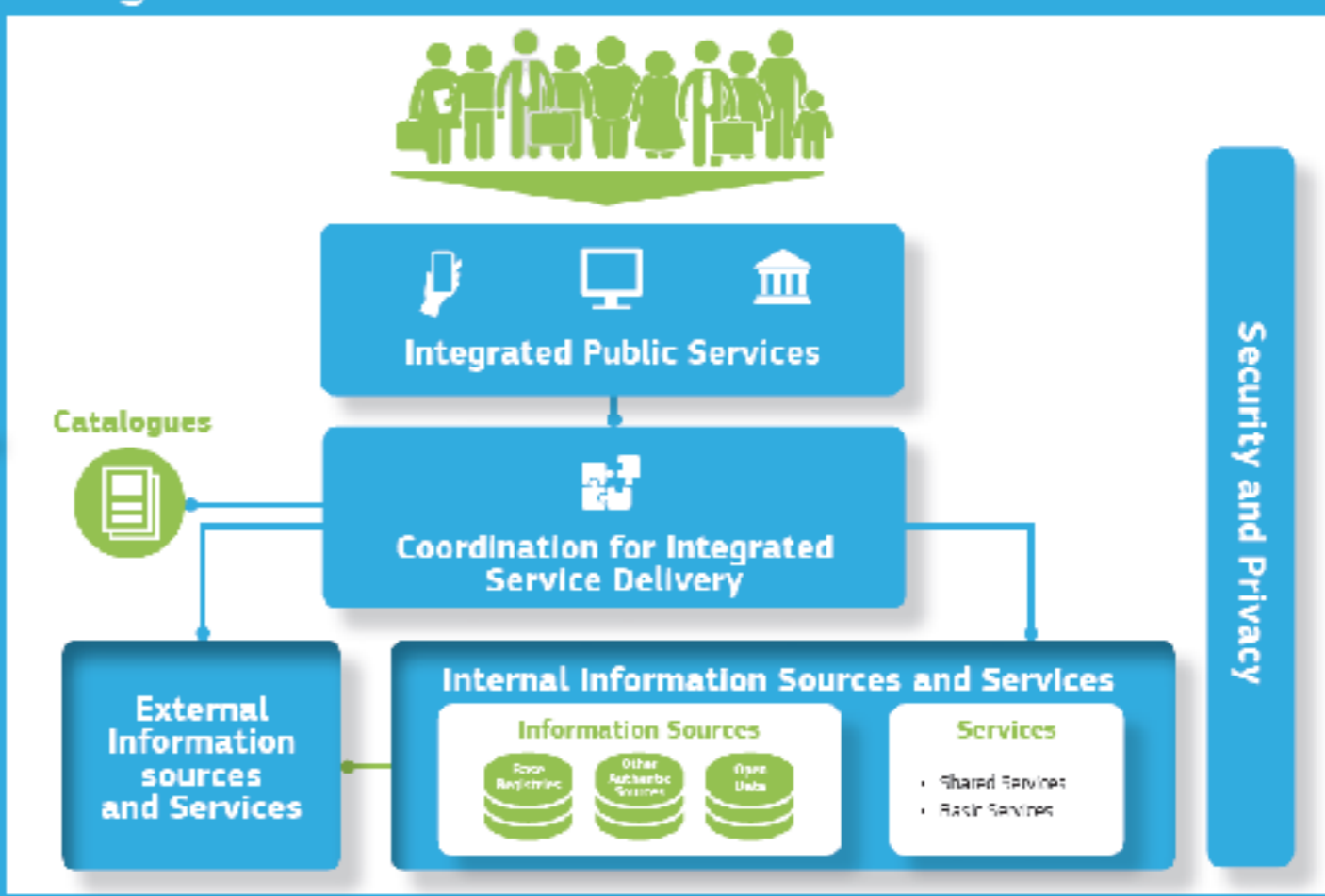
Namespace Document 14 January 2014 - *Paddington Edition*

EIF Conceptual Model

Interoperability Governance



Integrated Public Service Governance



Interoperability Principles



Nome	Meio	Distância	Tempo
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Rita Vieira	bicicleta	3300	20



Conceitos:
Perfis de Aplicação
Esquemas de codificação
Unidades de Medida
Vocabulários controlados



UC Web Semântica

- Seria bom:
 - poder procurar por cursos com determinadas características em toda a UE ou em todo o mundo;
 - poder procurar por projetos de investigação...
 - poder relacionar com este tipo de informação ou outra
- ... tanto o que podemos fazer com esta informação toda em LOD!



UC Web Semântica

- + de 10 anos; 3 anos em PBL;
- 2015/2016 - Descrição de cursos - 2 equipas;
- 2016/2017 - Descrição de cursos - 2 equipas + Descrição de centros de investigação - 2 equipas;
- Resultados: 1 PA cursos + 1 PA centros + vários vocabulários em SKOS.



CENTROALGORITMI

UC Web Semântica

Tudo **disponível** à medida que se vai desenvolvendo em

<http://wiki.dsi.uminho.pt/>

PA de CI - Modelo de domínio

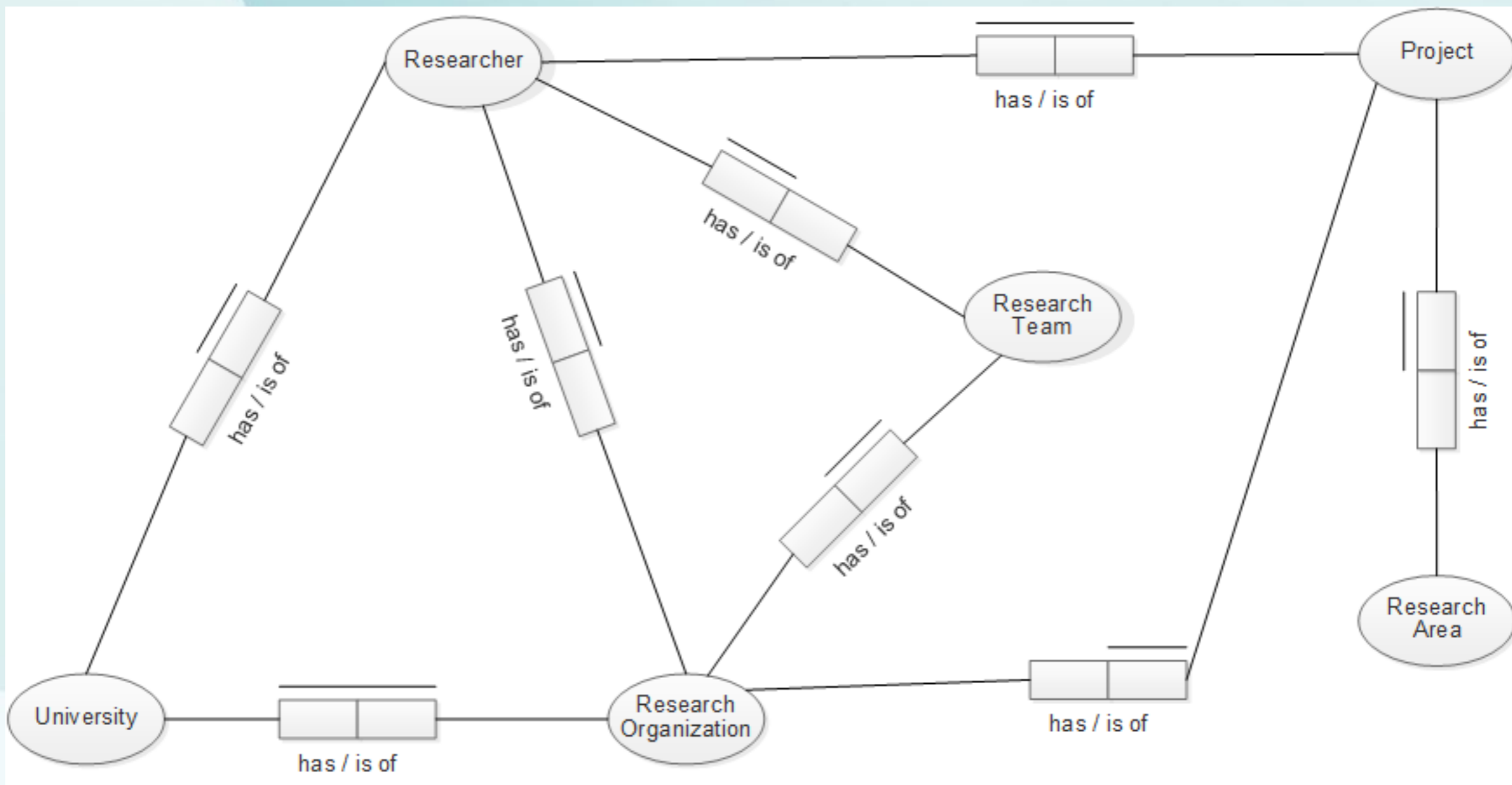


Tabela 2 - Atributos da entidade University

University		
Attribute	Vocabularies in LOV	URL
University Name	foaf	http://xmlns.com/foaf/spec/#term_name
Date Created	dcterms	http://purl.org/dc/terms/created
Acronym	cerif	http://www.eurocris.org/ontologies/cerif/1.3/#acronym
Location	dbpedia	http://dbpedia.org/ontology/location
City	dbpedia	http://dbpedia.org/ontology/city
E-mail	foaf	http://xmlns.com/foaf/spec/#term_mbox
Telephone	foaf	http://xmlns.com/foaf/spec/#term_phone
Country	dbpedia	http://dbpedia.org/ontology/country

Tabela 3 - Atributos da entidade Research Organization

Research Organization		
Attribute	Vocabularies in LOV	URL
Research Organization Name	foaf	http://xmlns.com/foaf/spec/#term_name
Date Created	dcterms	http://purl.org/dc/terms/created
Acronym	cerif	http://www.eurocris.org/ontologies/cerif/1.3/#acronym
Location	dbpedia	http://dbpedia.org/ontology/location
City	dbpedia	http://dbpedia.org/ontology/city
E-mail	foaf	http://xmlns.com/foaf/spec/#term_mbox
Telephone	foaf	http://xmlns.com/foaf/spec/#term_phone
Organizational Unit	schema	http://vocab.org/aiiso/schema#organizationalUnit
Partner	dbpedia	http://dbpedia.org/ontology/projectParticipant

Tabela 4 - Atributos da entidade Researcher

Researcher		
Attribute	Vocabularies in LOV	URL
Researcher Name	foaf	http://xmlns.com/foaf/spec/#term_name
Location	dbpedia	http://dbpedia.org/ontology/location
E-mail	foaf	http://xmlns.com/foaf/spec/#term_mbox
Telephone	foaf	http://xmlns.com/foaf/spec/#term_phone
Department	dbpedia	http://dbpedia.org/ontology/department
Researcher Role	org	https://www.w3.org/ns/org#roleProperty
Citizenship	dbpedia	http://dbpedia.org/ontology/citizenship

Tabela 5 - Atributos da entidade Project

Project		
Attribute	Vocabularies in LOV	URL
Project Name	foaf	http://xmlns.com/foaf/spec/#term_name
Start Date	dbpedia	http://dbpedia.org/ontology/projectStartDate
End Date	dbpedia	http://dbpedia.org/ontology/projectEndDate
Objective	dbpedia	http://dbpedia.org/ontology/projectObjective
Partner	dbpedia	http://dbpedia.org/ontology/projectParticipant

Tabela 6 - Atributos da entidade Research Team

Research Team		
Attribute	Vocabularies in LOV	URL
Team Name	foaf	http://xmlns.com/foaf/spec/#term_name
Team Leader	dbpedia	http://dbpedia.org/ontology/leader
Homepage	foaf	http://xmlns.com/foaf/spec/#term_homepage

Tabela 7 - Atributos da entidade Research Area

Research Area		
Attribute	Property	URL
Research Area Name	foaf	http://xmlns.com/foaf/spec/#term_name

```

<!-- Entity: Research Organization -->
<rdf:Description rdf:about="http://algoritmi.uminho.pt/">
  <rdf:type rdf:resource="http://vivoweb.org/ontology/core#ResearchOrganization"/>
  <foaf:name>Centro Algoritmi</foaf:name>
  <cerif:acronym>ALGORITMI</cerif:acronym>
  <dbpedia:location rdf:parseType="Resource">
    <rdf:value>Campus de Azurém</rdf:value>
    <rdf:value rdf:resource="http://www.geonames.org/maps/google_41.45035_-8.293852.html"/>
  </dbpedia:location>
  <foaf:mbox rdf:resource="mailto:secretaria@algoritmi.uminho.pt"/>
  <foaf:phone rdf:datatype="http://www.ietf.org/rfc/rfc2806.txt">+351253510180</foaf:phone>
  <schema:organizationalUnit rdf:resource="http://algoritmi.uminho.pt/leadership"/>
  <dbpedia:university rdf:resource="https://www.uminho.pt"/>
  <dbpedia:partner>
    <rdf:Bag>

```

```

<!-- Research Team: SEMAG -->
<rdf:Description rdf:about="http://algoritmi.uminho.pt/research-teams/semag/">
  <rdf:type rdf:resource="http://vivoweb.org/ontology/core#Team"/>
  <foaf:name>Software Engineering and Management Group</foaf:name>
  <cerif:acronym>SEMAG</cerif:acronym>
  <dbpedia:leader rdf:resource="http://orcid.org/0000-0002-3626-2569"/>
  <mrel:res>
    <rdf:Bag>
      <rdf:li rdf:resource="http://orcid.org/0000-0003-1174-1966"/>
      <rdf:li rdf:resource="http://orcid.org/0000-0002-3626-2569"/>
      <rdf:li rdf:resource="http://orcid.org/0000-0002-3249-6229"/>
      <rdf:li rdf:resource="http://orcid.org/0000-0002-4303-3908"/>
      <rdf:li rdf:resource="http://orcid.org/0000-0003-3525-0619"/>
      <rdf:li rdf:resource="http://orcid.org/0000-0003-0011-6030"/>
    </rdf:Bag>
  </mrel:res>

```




Facilitar o rigor nos dados e nas descrições dos dados (catálogos)

Facilitar a criação de serviços globais de valor acrescentado

assunto/subject: link + texto em vez de apenas texto

Interoperabilidade semântica

Vocabulários



Vocabulário da FCT

```
<skos:hasTopConcept rdf:resource = "0100"/>
<skos:hasTopConcept rdf:resource = "0200"/>
<skos:hasTopConcept rdf:resource = "0300"/>
<skos:hasTopConcept rdf:resource = "0400"/>

</skos:ConceptScheme>

<!--Ciências Sociais e Humanidades-->

<skos:Concept rdf:about="0100">
  <skos:definition xml:lang="en">Social sciences is the science branch that studies the social
  <skos:definition xml:lang="pt">Ciências sociais é um ramo da ciência que estuda os aspetos
  <skos:prefLabel xml:lang="en">Science of Social and Humanity</skos:prefLabel>
  <skos:prefLabel xml:lang="pt">Ciências Sociais e Humanidades</skos:prefLabel>
  <skos:narrower rdf:resource="0110"/><!--Individuos, Instituições e Mercados-->
  <skos:narrower rdf:resource="0120"/><!--Instituições, Valores, Crenças e Comportamento-->
  <skos:narrower rdf:resource="0130"/><!--Ambiente, Território e População-->
  <skos:narrower rdf:resource="0140"/><!--A Mente Humana e a sua Complexidade-->
  <skos:narrower rdf:resource="0150"/><!--Culturas e produção cultural-->
  <skos:narrower rdf:resource="0160"/><!--Estudo do Passado Humano-->
</skos:Concept>
```

```
<!--Individuos, Instituições e Mercados-->  
<skos:Concept rdf:about="0110">  
  <skos:prefLabel xml:lang="en">Individuals, Institutions and Markets</skos:prefLabel>  
  <skos:prefLabel xml:lang="pt">Individuos, Instituições e Mercados</skos:prefLabel>  
  
  <skos:narrower rdf:resource="0111"/><!--Economia-->  
  <skos:narrower rdf:resource="0112"/><!--Finanças-->  
  <skos:narrower rdf:resource="0113"/><!--Gestão-->  
</skos:Concept>
```

```
<!--Economia-->  
<skos:Concept rdf:about="0111">  
  <skos:prefLabel xml:lang="en">Economy</skos:prefLabel>  
  <skos:prefLabel xml:lang="pt">Economia</skos:prefLabel>  
</skos:Concept>
```

```
<!--Finanças-->  
<skos:Concept rdf:about="0112">  
  <skos:prefLabel xml:lang="en">Finance</skos:prefLabel>  
  <skos:prefLabel xml:lang="pt">Finanças</skos:prefLabel>  
</skos:Concept>
```



Vocabulário da UE

```
<?xml version="1.0" encoding="utf-8"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:skos="http://www.w3.org/2004/02/skos/core#"
  xmlns:dc="http://purl.org/dc/elements/1.1/">

  <skos:ConceptScheme rdf:about="http://ws.org/scienceArea">
    <skos:hasTopConcept rdf:resource="#ScienceArea01"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea02"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea03"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea04"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea05"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea06"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea07"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea08"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea09"/>
    <skos:hasTopConcept rdf:resource="#ScienceArea10"/>
  </skos:ConceptScheme>

  <!-- Area 1 - Agriculture and food security -->
  <skos:Concept rdf:about="#ScienceArea01" xml:lang="en">
    <skos:prefLabel xml:lang="en">Agriculture and food security</skos:prefLabel>
    <skos:inScheme rdf:resource="http://ws.org/scienceArea"/>
    <skos:topConceptOf rdf:resource="http://ws.org/scienceArea"/>
  </skos:Concept>

```



```
<!-- Area 1 - Agriculture and food security -->
<skos:Concept rdf:about="#ScienceArea01" xml:lang="en">
  <skos:prefLabel xml:lang="en">Agriculture and food security</skos:prefLabel>
  <skos:inScheme rdf:resource="http://ws.org/scienceArea"/>
  <skos:topConceptOf rdf:resource="http://ws.org/scienceArea"/>
  <skos:relatedMatch rdf:resource="https://ec.europa.eu/jrc/en/science-area/agr
  <skos:narrower rdf:resource="#Sub01ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub02ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub03ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub04ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub05ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub06ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub07ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub08ScienceArea01"/>
  <skos:narrower rdf:resource="#Sub
  <skos:narrower rdf:resource="#Sub
  <skos:narrower rdf:resource="#Sub
  <skos:narrower rdf:resource="#Sub
</skos:Concept>
```

```
<skos:Concept rdf:about="#Sub01ScienceArea01" xml:lang="en">
  <skos:prefLabel xml:lang="en">Agricultural biodiversity</skos:prefLabel>
  <skos:inScheme rdf:resource="http://ws.org/scienceArea"/>
  <skos:hasTopConcept rdf:resource="#ScienceArea01"/>
  <skos:relatedMatch rdf:resource="https://ec.europa.eu/jrc/en/research-topic
</skos:Concept>
<skos:Concept rdf:about="#Sub02ScienceArea01" xml:lang="en">
  <skos:prefLabel xml:lang="en">Agricultural markets and international trade<
  <skos:inScheme rdf:resource="http://ws.org/scienceArea"/>
  <skos:hasTopConcept rdf:resource="#ScienceArea01"/>
  <skos:relatedMatch rdf:resource="https://ec.europa.eu/jrc/en/research-topic
</skos:Concept>
<skos:Concept rdf:about="#Sub03ScienceArea01" xml:lang="en">
  <skos:prefLabel xml:lang="en">Agricultural monitoring</skos:prefLabel>
  <skos:inScheme rdf:resource="http://ws.org/scienceArea"/>
  <skos:hasTopConcept rdf:resource="#ScienceArea01"/>
  <skos:relatedMatch rdf:resource="https://ec.europa.eu/jrc/en/research-topic
</skos:Concept>
```



Trabalho em curso

- Consolidação dos PA
 - Propriedades usadas e possíveis valores;
- Consolidação dos vocabulários
 - Descrição, idiomas, relações
- Relação entre os vocabulários?



- Disponibilização no portal de dados abertos do DSI/UMinho (em criação);
- Disponibilização à FCT e UE.



CENTROALGORITMI

Reconhecimento:

Todos os alunos da UC de WS da UMinho dos anos lectivos de 2015/2016 e 2016/2017.

Aos alunos do meu grupo de projecto da UC de PTSI do ano lectivo de 2016/2017.

Muito obrigada.