

***The transition of FRIS 1.0 towards FRIS 2.0:  
Focus on semantic interoperability***

## Flanders Research Information Space:

Virtual space collecting information on publicly-funded research in Flanders

### Goal:

- Simple, transparent, open platform
- Government, researchers, business, citizens

### Initiative:

- Flemish Government, Dep. Economy Science and Innovation

- Data providers:
  - All 5 Flemish Universities
  - Financial stimulus for data delivery in bulk, 2 times/year
  - CERIF-XML
- Data & classifications:
  - Researchers —————> Science Discipline Codes
  - Organisations —————> Science Discipline Codes
  - Research projects —————> Financial Codes
- Simple technical validation rules
  - Example: Use a valid financial code

# FRIS 1.0

The screenshot shows the FRIS Research Portal website. At the top left is the EWI logo and the text "FRIS Research Portal Boosting knowledge, creating prosperity". At the top right are language options "Nederlands" and "English", and navigation links "Help", "Contact", "About the Portal", and "News". Below this is a search bar with a "Search" button. A blue navigation bar contains the following categories: "Research projects", "Publications", "Organisations", and "Researchers".

**Home**

**In search of research ?  
The Flemish research portal will be your guide !**

Who is doing research on Alzheimer's disease in Flanders ? Where can I find experts on nanotechnology ? Which current projects of the Flemish universities are making inquiries about stem cells ?

Find the answer to your questions at the FRIS (Flanders Research Information Space) research portal...

You can browse through the database by using several search options : by research projects, organisations or persons.

**News Headlines**

**Database about biodiversity in oceans gets international acclaim** *Apr 19, 2017*

Read more about the [Ocean Biogeographic Information System \(OBIS\)](#) of IOC-UNESCO, which is housed in Ostend (Belgium).

**New members Young Academy of Flanders** *Mar 15, 2017*

The Young Academy of Flanders chose ten new members in 2017: 8 scientists and two artists. The inauguration takes place on March 16, 2017. [Read more](#) (Dutch only)

Search and browse in  
**29734 Research projects**

Search and browse in  
**2357 Organisations**

Search and browse in  
**29264 Researchers**

<p>????????? <b>Historic</b></p> <p><b>KU Leuven</b></p> <p>CATALYTIC CONVERSION OF BIOETHANOL INTO CHEMICAL INTERMEDIATESThe use of renewable raw materials is one of the best ways of making the chemical industry more greener and environmental friendly. In the long term, biomass will be one of the most reliable source of organic carbon based materials, of which bioethanol is the most potential candidate. Hence there has been serious research interest for the conversion of ethanol into hydrocarbons. All the presently known ethanol to hydrocarbon convers...</p> <p><a href="#">Centre for Surface Chemistry and Catalys (C_Opp_chemie)</a> <a href="#">Johan Martens</a> <a href="#">Sambhu Radhakrishnan</a></p>	Project	<ul style="list-style-type: none"> <li>• <a href="#">Agricultural engineering, agricultural machines, farmhouse construction</a> 117</li> <li>• <a href="#">Agrochemistry</a> 25</li> <li>• <a href="#">Agronomics</a> 111</li> <li>• <a href="#">Air transport technology</a> 4</li> <li>• <a href="#">American languages and literatures</a> 22</li> <li>• <a href="#">Anaesthesiology, intensive care</a> 67</li> <li>• <a href="#">Analytical chemistry</a> 503</li> <li>• <a href="#">Ancient Greek language and literature</a> 44</li> <li>• <a href="#">Ancient history</a> 88</li> <li>• <a href="#">Animal anatomy, animal morphology</a> 135</li> <li>• <a href="#">Animal ecology</a> 381</li> <li>• <a href="#">Animal ethology and psychology</a> 118</li> <li>• <a href="#">Animal physiology</a> 176</li> <li>• <a href="#">Applied and experimental psychology</a> 297</li> </ul>
<p><b>KU Leuven</b></p> <p>No English Abstract</p> <p><a href="#">Process Engineering for Sustainable Syst (A_ProcESS)</a> <a href="#">Georgios Stefanidis</a> <a href="#">Christos Xiouras</a></p>	Project	

## Project IDs

<p><b>KU Leuven</b></p> <p>No English Abstract</p> <p><a href="#">Associated Services</a> <a href="#">Francky Cattho</a></p>	<p><b>Abdominal Surgical Oncology</b></p> <p><b>KU Leuven</b></p> <p>- Anorectal function.Evaluation of obstipation and incontinence.Sphincter substitutes.Sphincter reconstructionConstruction of reservoirs- Intestinal Ischemia, intestinal preservation and transplant...</p> <p><a href="#">Baki Topal</a></p>	Research unit
<p><b>Academic Center for General Practice</b></p> <p><b>KU Leuven</b></p> <p>The department's research is organized within four large program-mes with significant interactions between them: development of instruments and outcome measurement, educational research, clinical e...</p> <p><a href="#">Bert Aertgeerts</a></p>	<p><b>Academic Centre for Practical Theology</b></p> <p><b>KU Leuven</b></p> <p><a href="#">Didier Pollefeyt</a></p>	Research unit
<p><b>Academic Tutoring Group</b></p> <p><b>University of Antwerp</b></p>	<p><b>Mohamed AABI</b></p> <p><b>Vrije Universiteit Brussel</b></p> <p>Computational Modelling (COMO) Informatics and Applied Informatics (DINF)</p> <p><b>Manuel Aalbers</b></p> <p><b>KU Leuven</b></p> <p>Division of Geography (A_Geografie)</p> <p><b>Manuel AALBERS</b></p> <p><b>Vrije Universiteit Brussel</b></p> <p>Cosmopolis Centre for Urban Research (COSM) Geography (DGGF)</p>	Administrative unit

## Organisation IDs

<p><b>Discipline codes within the result</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Accounting</a> 8</li> <li>• <a href="#">Actuarial science</a> 2</li> <li>• <a href="#">Administrative law</a> 7</li> <li>• <a href="#">Adult education, permanent education</a></li> <li>• <a href="#">Aerial, maritime and space law</a> 1</li> <li>• <a href="#">Aesthetics</a> 5</li> <li>• <a href="#">African languages and literatures</a> 1</li> <li>• <a href="#">Agricultural economics</a> 5</li> <li>• <a href="#">Agricultural engineering, agricultural machines, farmhouse construction</a> 3</li> <li>• <a href="#">Agrochemistry</a> 3</li> <li>• <a href="#">Agronomics</a> 8</li> </ul>
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ORCID  
ResearcherID  
ScopusID



<p>Researcher</p>	<p><b>Science domains within the result</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Applied biological sciences, biotechnology</a> 105</li> <li>• <a href="#">Architecture, town and country planning</a> 125</li> <li>• <a href="#">Biology</a> 693</li> <li>• <a href="#">Biomedical sciences (incl. biochemistry)</a> 667</li> <li>• <a href="#">Chemical engineering and applied chemistry</a> 55</li> </ul>
<p>Researcher</p>	
<p>Researcher</p>	

# FRIS 2.0 Needs & drivers

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- Correct, actual, complete research information
  - Maximum reuse of research information
  - By connecting data silo's using standards & identifiers
  - Reducing system costs
  
- CRIS services & applications
  - Administrative reduction of research reporting (Peters et al. 2011)
  - Increased strategic intelligence
  - Efficient & effective policy monitoring
  - More information services

- Data providers:
  - All 5 Flemish Universities
  - Some strategic research centres
  - Some research institutes
  - Not (yet) university colleges
  
- Real-time data delivery
- SOA, 1 SOAP data entry webservice built on CERIF-XML

# FRIS 2.0

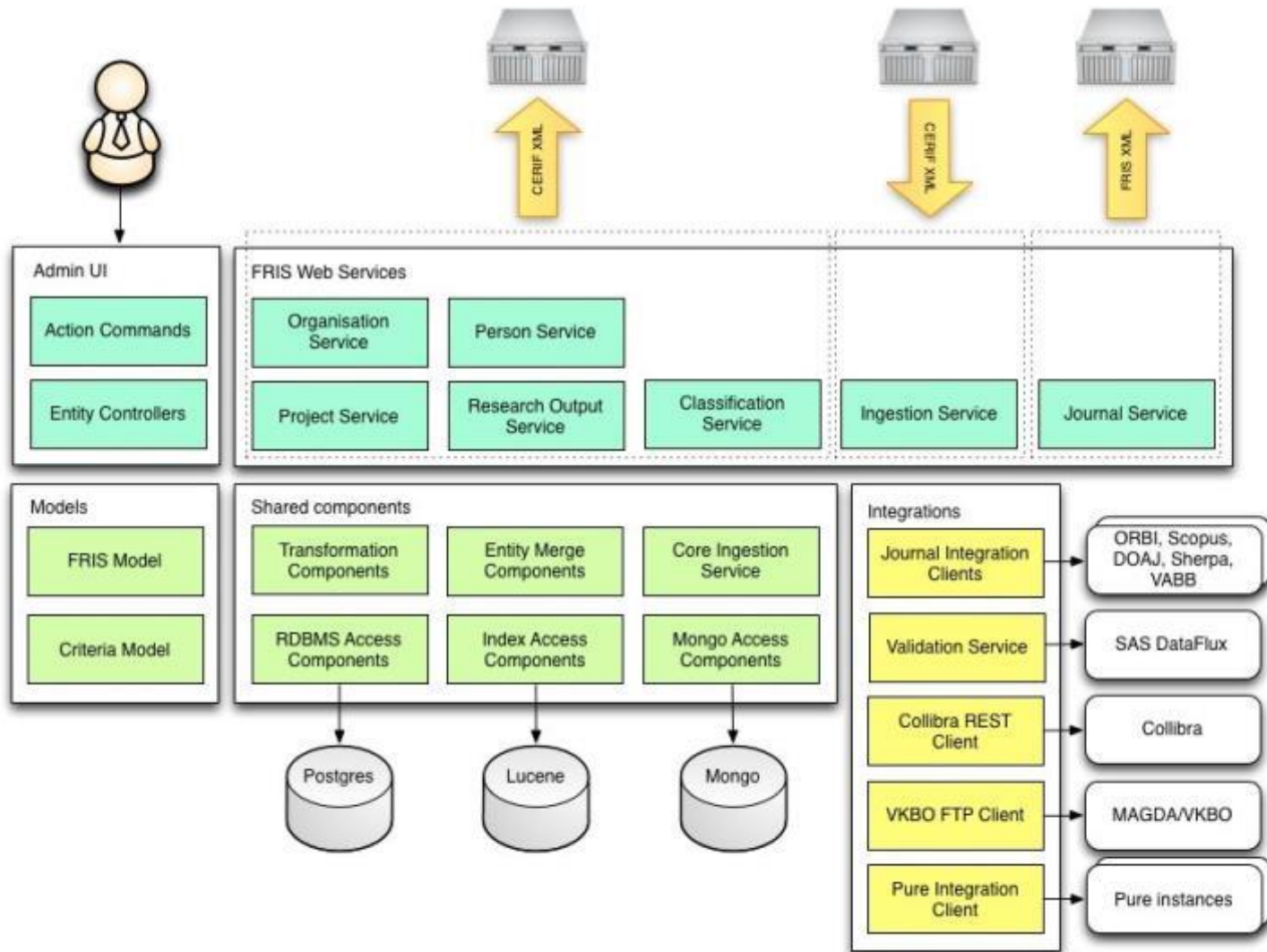


Figure taken from the FRIS portal, Dept. EWI, Flemish government



- Data & classification governance:
  - Researchers —————> Science Discipline Codes
  - Organisations —————> Science Discipline Codes
  - Research projects —————> Financial Codes
  - Publications
- Data quality and completeness:
  - Business & technical validation rules
- Open data:
  - 6 SOAP webservices
- New research portal with more search functionalities

***The transition of FRIS 1.0 towards FRIS 2.0:***

***Focus on semantics***

# The importance of semantics

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- FRIS is not only about the architecture, technology, ...
- The true value comes from the quality of the information contained



# The importance of semantics

It's not about agreeing that semantics is important, it's about real commitment by everyone to implement semantics

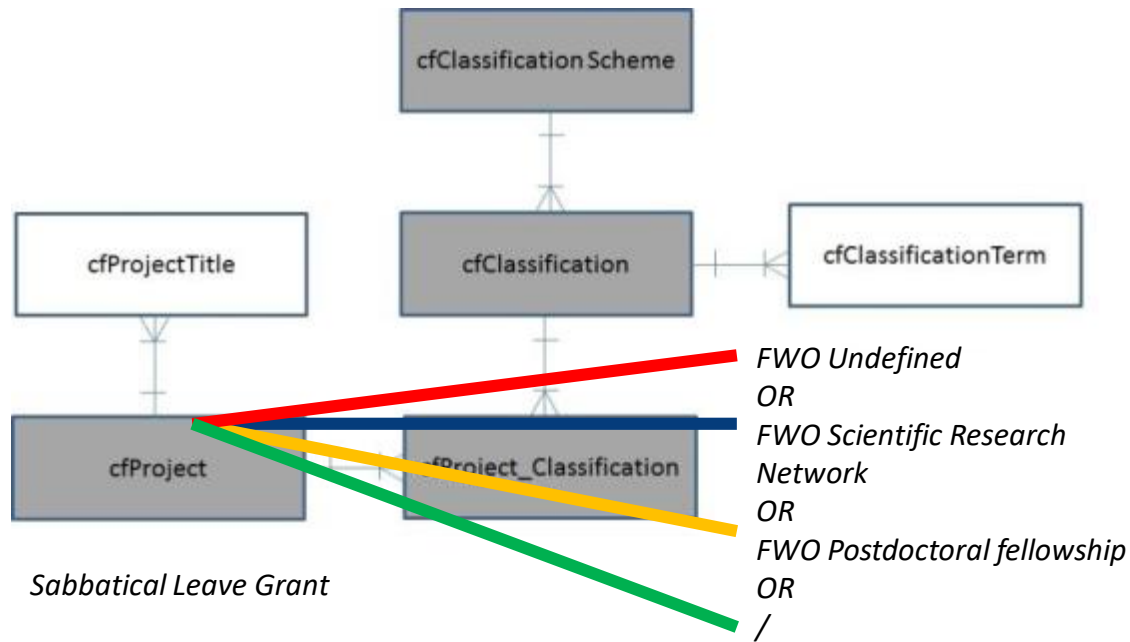


# CERIF, almost unlimited flexibility for modelling RI

- Semantic mismatches

- Terminology:

same concepts, different meanings and vice versa  
→ at the inter- and intra-organizational level

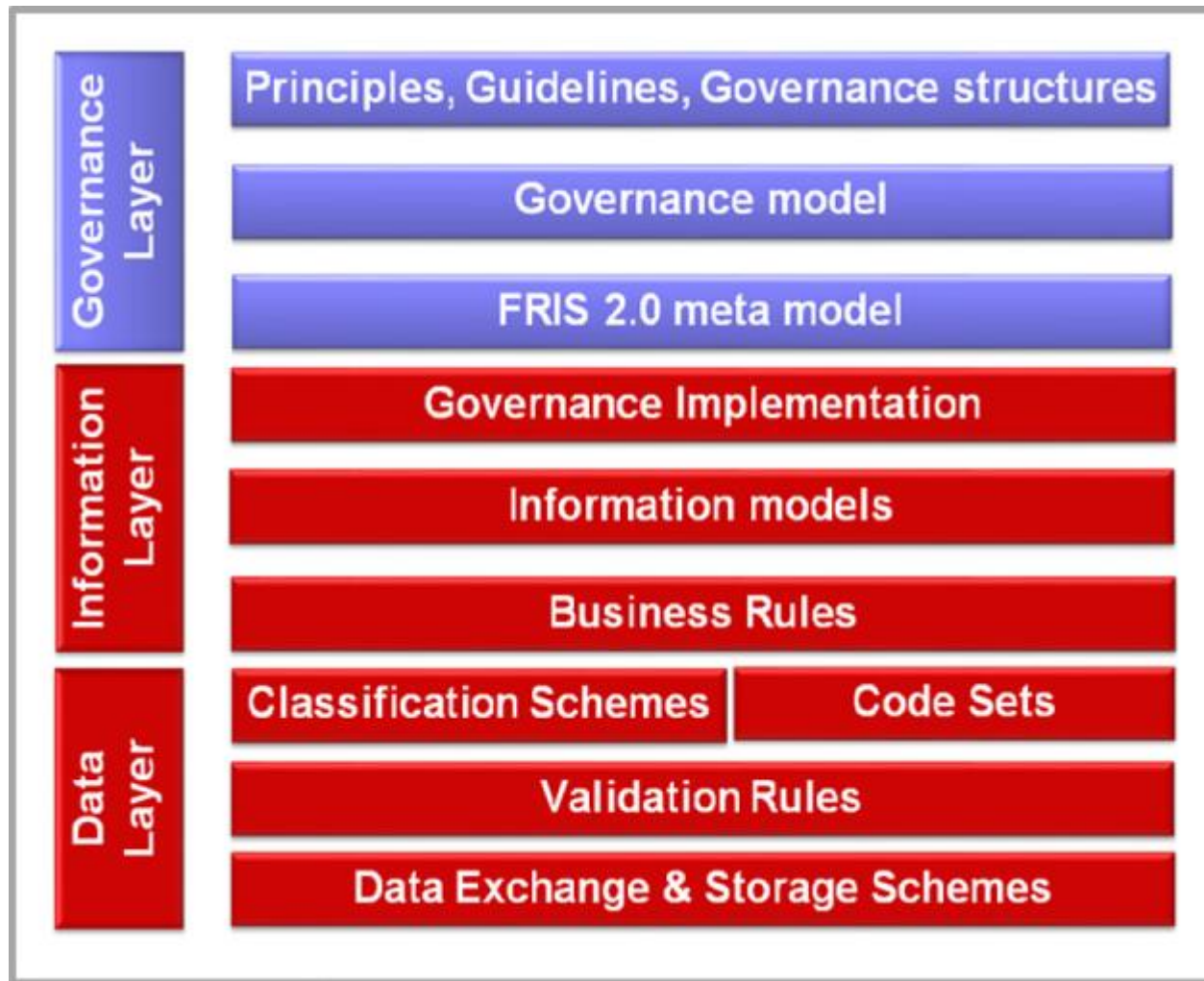


***The transition of FRIS 1.0 towards FRIS 2.0:***

***Focus on semantics***

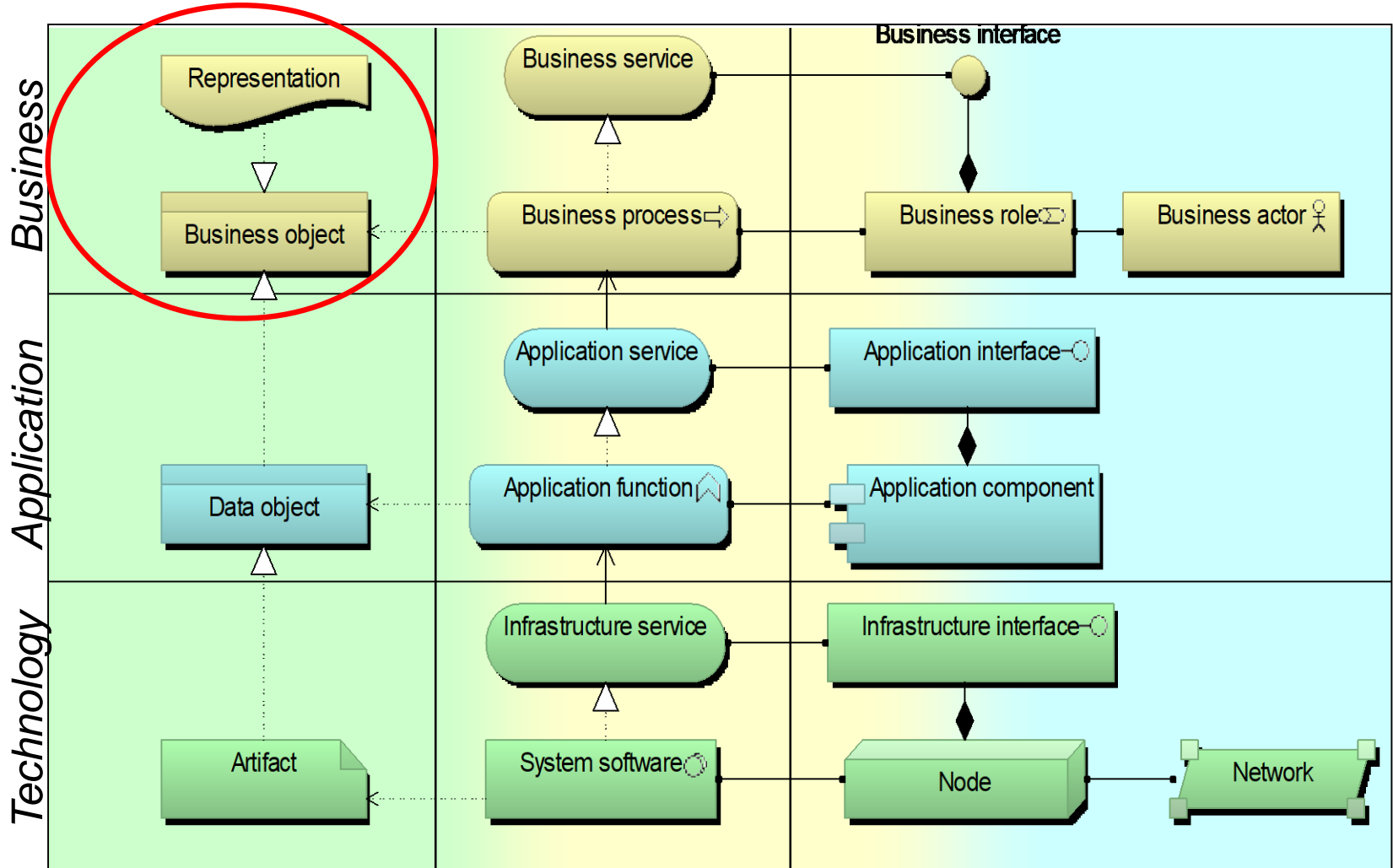
***→ data and classification governance***

# 1. Installation of a governance structure: WHO?



# 2. Creation of a business layer: WHAT?

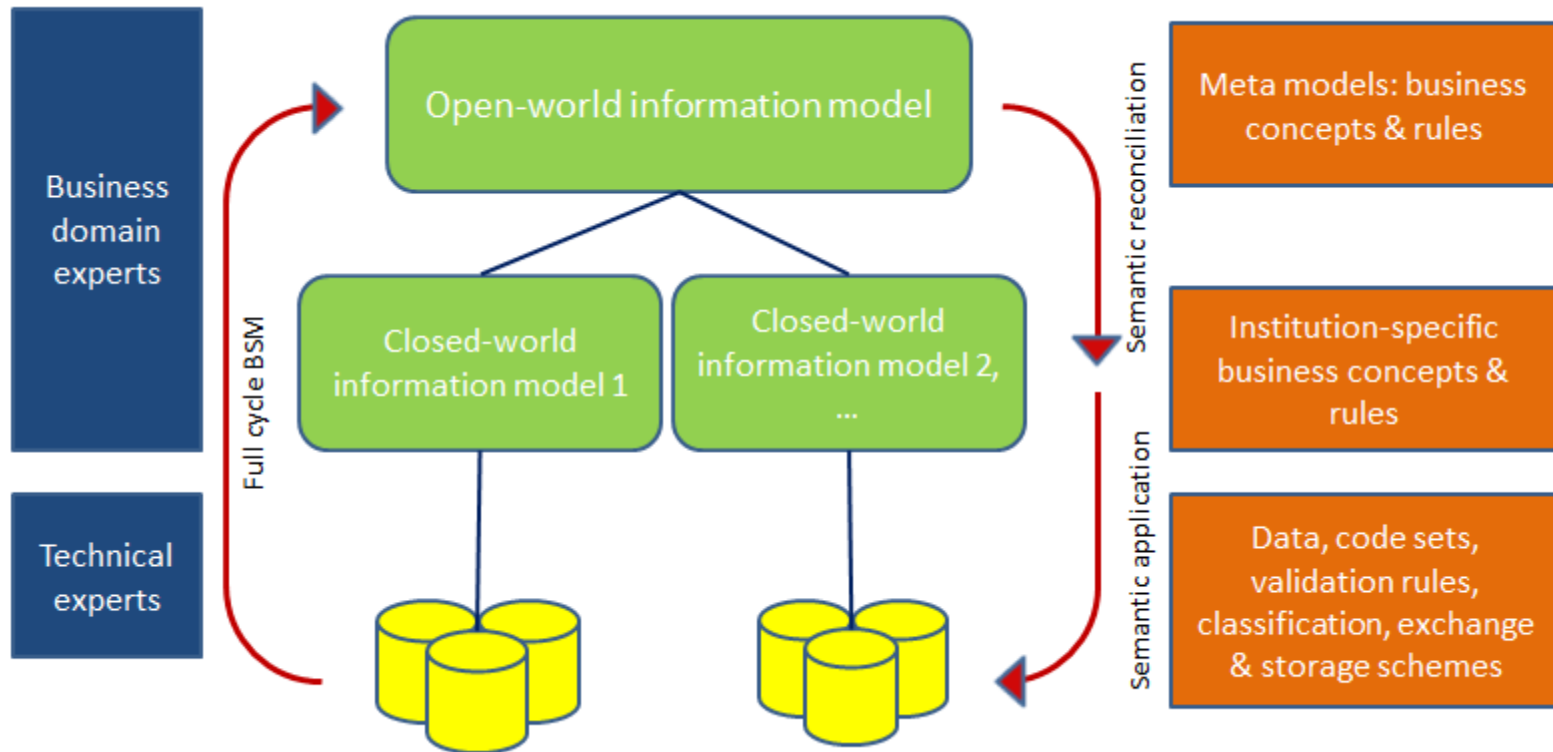
Recording of business concepts & meanings by term. theory





# 3. Inter-organizational semantic alignment

- Definition of required business concepts on the meta-level
- Collaborative, machine-readable manner
- *Full-cycle* business semantics management



# Data governance



**UH Book**

Type: **FRIS Business Object** Status: **Candidate**



[Edit](#) [Move](#) [Delete](#) [Simple Approval](#) [Vote](#) [Edit Business Term](#) [Funding Program Onboarding Process](#) [Discover](#)

## Overview

+ Add

## Hierarchy

## Fact Types

## Responsibilities

## Traceability

### Definition

A book is a set of written, printed, illustrated, or blank sheets, made of ink, paper, parchment, or other materials, usually fastened together to hinge at one

### Descriptive Example

No value has been given yet. Double click or use the edit button.

### identified by

Name	Definition	Description	Domain
DOI	DOI is an acronym for "digital o... The DOI Handbook: <a href="http://www.d">http://www.d</a>		Identifier Glossary
ISBN	An ISBN is an International Stand...	An ISBN is essentially a product...	Identifier Glossary
UH Identifier	UHasselt handle, neemt de volg...		UH Identifier
VABB Identifier	The unique identifier of a re...		Identifier Glossary
WoS ID	The Identifier of Research Outp...	Synonyms found: ISI, ISI Identifi...	Identifier Glossary

### has property

Name	Definition	Descriptive Example	Domain
Abstract	a short resume		Research Output Glossary
Book Edition	a particular version of a book		Research Output Glossary
Book Series Name	A book series name is the nam...		Research Output Glossary
Book Volume	A volume forming part of a larg...		Research Output Glossary
ISSN	An International Standard Serial...		Identifier Glossary

## Comments

+ Add



Browser

Flanders Research Information Space > In

Filter on community or domain...

- > Data Governance Council
- > ECOOM
- ▼ Flanders Research Information Space
  - > FRIS Application Community
  - > FRIS Model Community
  - > FRIS Working Group on Business Rules
- ▼ Information Providers Community
  - > HoGent Research Information Community
  - > KU Leuven Research Information Community
  - > UAntwerpen Research Information Community
  - > UGent Research Information Community
- ▼ UHasselt Research Information Community
  - ▼ UHasselt Business Object Community
    - UH Funding
    - UH Identifier
    - UH Life Cycle
    - UH Location
    - UH Party
    - UH Project
    - UH Research Output
  - > UHasselt Publication Data Assets Community
    - Hasselt Research Information Glossary
- > VUB Research Information Community
- > Reference Models and Standards Community

## UH Model

- UH Book
- UH Book Section
- > UH Conference Material
- ▼ UH Journal Contribution
  - UH Article
  - UH Book Review
  - UH Correction
  - UH Correction, Addition J...
  - UH Discussion
  - UH Editorial Material

A nonperiodical publication con...

Book

A major section of a book, com...

Book chapter

Unpublished literature of conferen...

This term is used to collect a se...

An article reports of research o...

Journal Article

A critical appraisal of a book th...

Review Article

Correction of errors found in ar...

Journal Article

Correction of errors found in ar...

Journal Article

An article or paper that discuss...

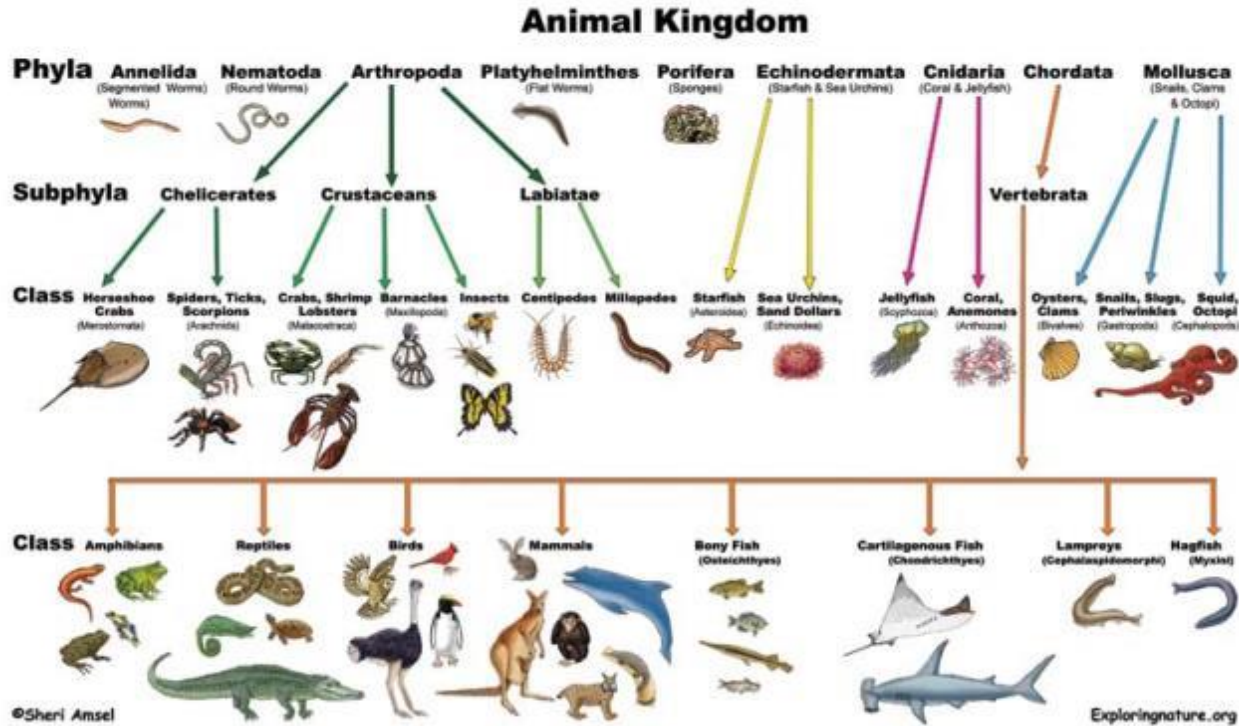
Journal Article

An article that gives the opinion...

Journal Editorial

## FRIS MetaModel

# What about research classifications?



# Example financial code list

3.8 EU - Programmes and initiatives outside the framework programmes					
	3800	EU - out of framework - indefinite	01/01/1980	31/12/9999	G3
	3801	IMPACT	01/01/1988	31/12/9999	G3
	3802	SPRINT	01/01/1988	31/12/9999	G3
	3803	TIDE	01/01/1988	31/12/9999	G3
	3804	ISC (International Scientific Cooperation)	01/01/1992	31/12/9999	G3
	3805	AVICENNE	01/01/1992	31/12/9999	G3
	3806	PECO/COPERNICUS (Central and Eastern Europe)	01/01/1993	31/12/9999	G3
	3807	INTAS	01/01/1994	31/12/9999	G3
	3808	ALTENER	01/01/1994	31/12/9999	G3
	3809	LIFE	01/01/1994	31/12/9999	G3
	3810	JRC (Joint Research Centers)	01/01/1988	31/12/9999	G3
	3811	Euratom	01/01/1980	31/12/9999	G3
	3899	Other EU initiatives out of framework	01/01/1980	31/12/9999	G3
3.9 Multilateral International Collaboration outside EU					

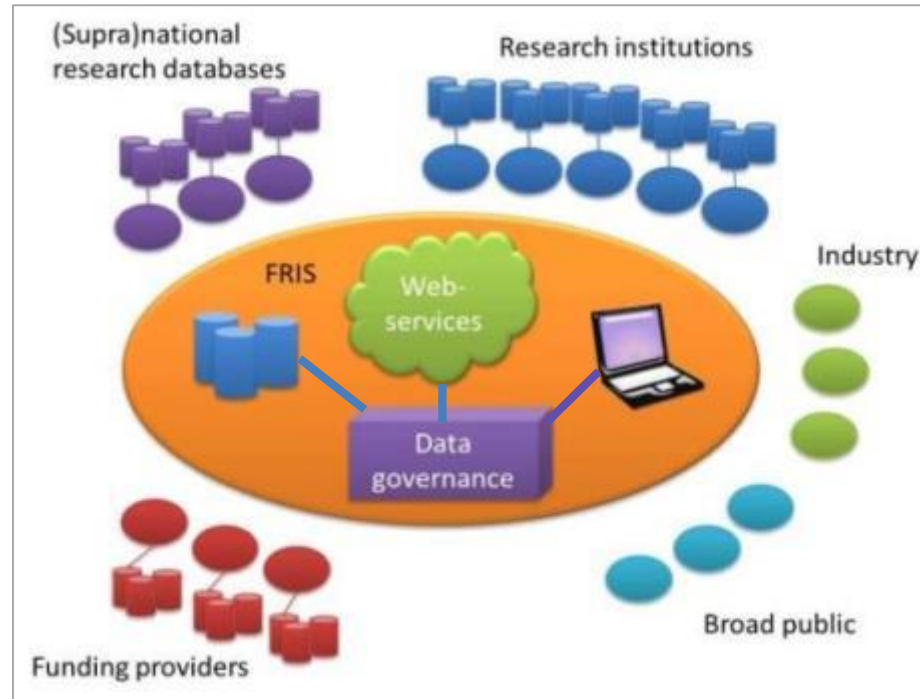
- Used for labelling research projects
  - Confusing terminology, no semantics foreseen
  - Decentral maintenance of code lists

# Classification governance

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- Roles & responsibilities
- Central maintenance of code lists in DGC, incl. allowed value
- Semantics and examples
- Workflows for creating/editing existing codes
- Full view on remarks & comments
- Concordance tables
- Publications, research projects, research disciplines, technology domains,...

# Integration with CRIS system



Data and classification governance is key to true semantic interoperability of CRIS systems in inter-organizational contexts

***Towards (open) research data management:  
status of the Flemish universities***



# (Open) Research Data management

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## Sense of urgency:

- Research data are valuable
  - verification of research results
  - verification of ownership
  - data collection and reuse

## Drivers:

- EU Commission Open data pilot; 2017
- Fund for Scientific Research Flanders end 2017



# Survey in Flemish universities

## Raising awareness:

1. Head of department

2. Per department:

1. Professor
2. Postdoctoral fellow
3. PhD student

Publications:

- Thema (*proofs*)
- White paper (*in preparation*)

<b>1. Types en formaten van data</b>	<ul style="list-style-type: none"><li>▪ Eigen vs. secundair</li><li>▪ Kwalitatief vs. kwantitatief</li><li>▪ Digitaal vs. andere</li></ul>
<b>2. Opslag en archivering van data</b>	<ul style="list-style-type: none"><li>▪ Volume</li><li>▪ Problemen met volume</li><li>▪ Opslag van ruwe en metadata</li><li>▪ Toegankelijk, begrijpelijk, vindbaar opgeslagen</li><li>▪ Anonimisering</li><li>▪ Versiebeheer</li><li>▪ Bewaring data na project</li></ul>
<b>3. Back-up en verlies van data</b>	<ul style="list-style-type: none"><li>▪ Back-up</li><li>▪ Plaats back-up</li><li>▪ Gebruik van internationale dataservice</li><li>▪ Beveiliging</li><li>▪ Dataverlies in het verleden</li></ul>
<b>4. Ethische en juridische aspecten</b>	<ul style="list-style-type: none"><li>▪ Gevoelige en vertrouwelijke data</li><li>▪ Wie is eigenaar en aansprakelijk</li><li>▪ Juridische bezorgdheid</li></ul>
<b>5. Infrastructuur en diensten</b>	<ul style="list-style-type: none"><li>▪ Er wordt al een data management plan gemaakt</li><li>▪ Er wordt met templates gewerkt</li><li>▪ Technische ondersteuning gewenst</li><li>▪ Training &amp; software m.b.t. RDM gewenst</li></ul>
<b>6. Samenwerking</b>	<ul style="list-style-type: none"><li>▪ Samenwerking</li><li>▪ Data delen</li><li>▪ Veilig data delen</li></ul>
<b>7. Toegankelijkheid en hergebruik</b>	<ul style="list-style-type: none"><li>▪ Wie heeft er toegang</li><li>▪ Hoe is er toegang</li><li>▪ Herbruikbare data</li><li>▪ Databaseveiliging</li><li>▪ Paswoord van back-up gearchiveerd</li></ul>

# Drafting a research data policy

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## Hasselt University: Central + 4 disciplinary RD policies

- Responsibility of researcher, central support
- Data management plans (criteria for internal research funds)
- Legal & ethical issues
  - RRI, GDPR, Property Law, Privacy Law, Ethics, Information safety, Acceptable Use Policy, Regulations from third parties (funders)
  - Anonymised, pseudonymised, encrypted data, metadata
- Infrastructure:
  - Which data? Digital data, materials and objects
  - Preservation, archival and removal
  - Interoperable: semantically, technically, linkage to RI objects/publishers

# Drafting a research data policy

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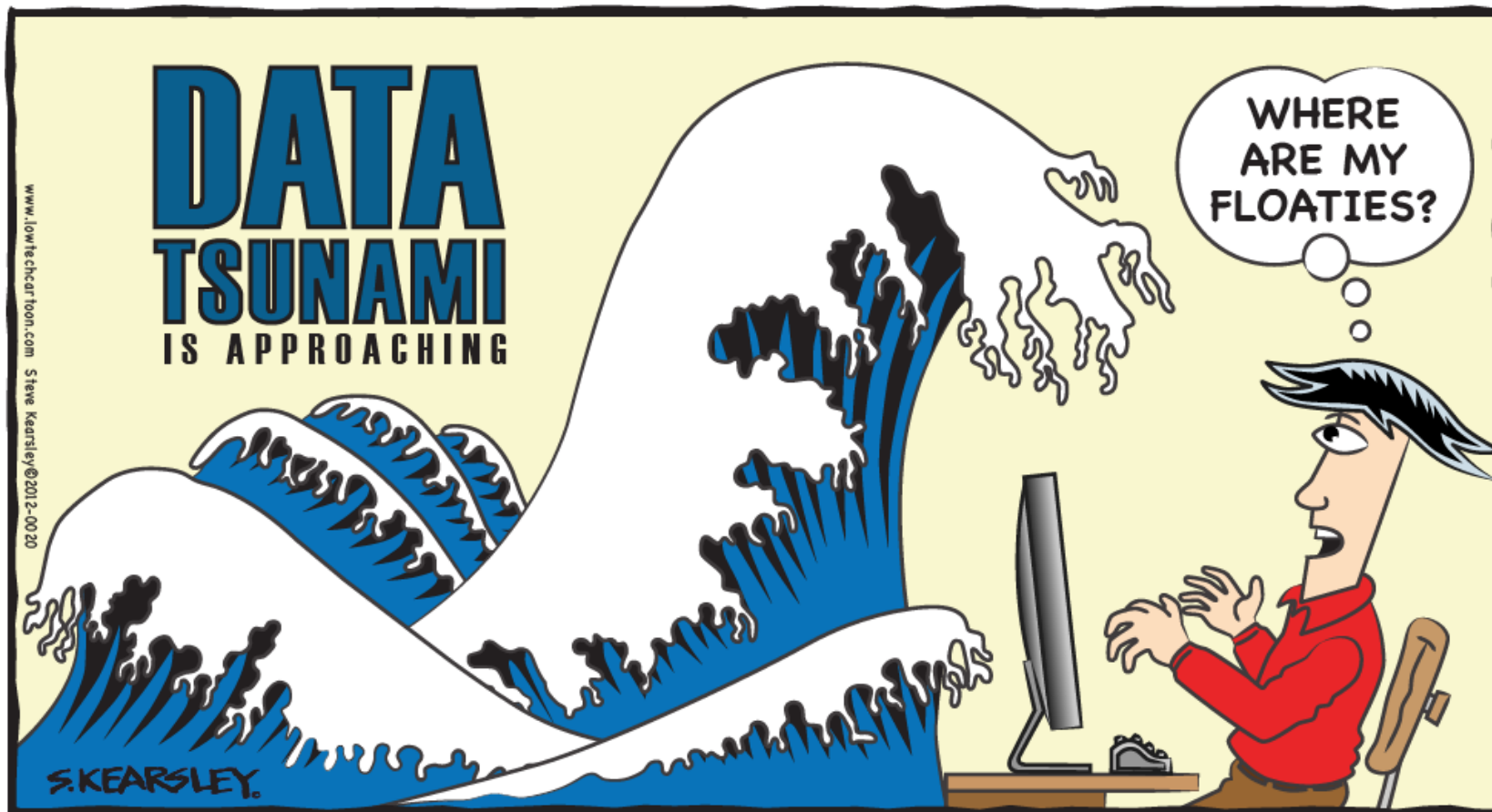
## Hasselt University: Central + 4 disciplinary RD policies

- Skills and expertise
  - Doctoral and senior training, training of reviewers
- IPR issues
- Reuse and public disclosure
- Exit policy for data of researchers leaving the university
- Monitoring and compliance
- Inclusion of RDM in the research(er's) life cycle
  - Redraw research process
  - New expert team: legal and ethical expertise, information safety and data protection officers, valorisation experts, data repository managers, HR officers

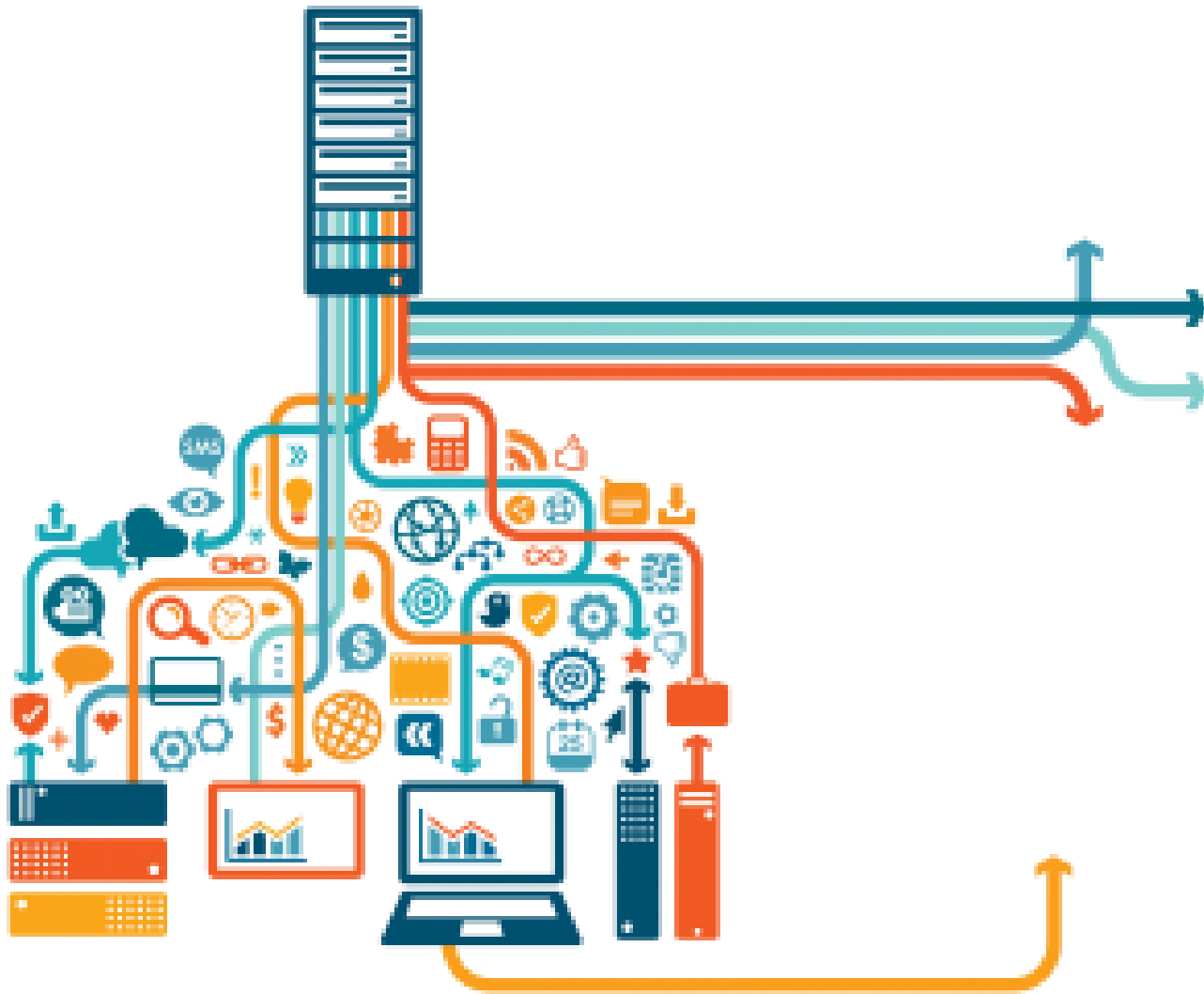
# (Open) Research Data management

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- VLIR Working Group RDM
  - Members:
    - Legal officers, research coordination officers + ...
  - Cooperation on:
    - Drafting DMP questions for funders
      - Application, start & end
      - Financial incentives? By and to whom?
    - Looking for an appropriate infrastructure
- Flemish consortium
  - [DMPonline.be](http://DMPonline.be)
  - BELNET server, coordinated by Ghent University
  - 4 Flemish universities
  - From 1/1/2018: research institutes



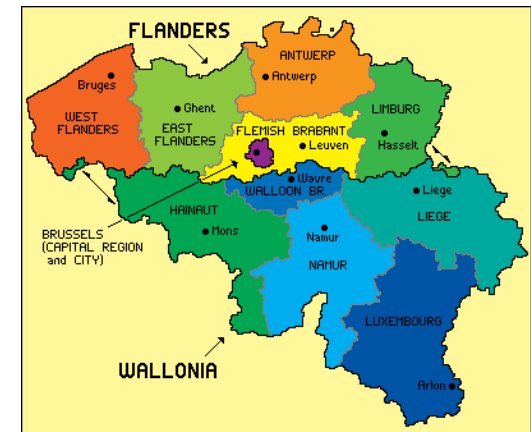






# Acknowledgements

- Flanders Government, Department Economy, Science and Innovation (EWI)
- ECOOM-UHasselt project team



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Two roads to the same goal?*

Belgium / Hasselt 23-25 May 2018