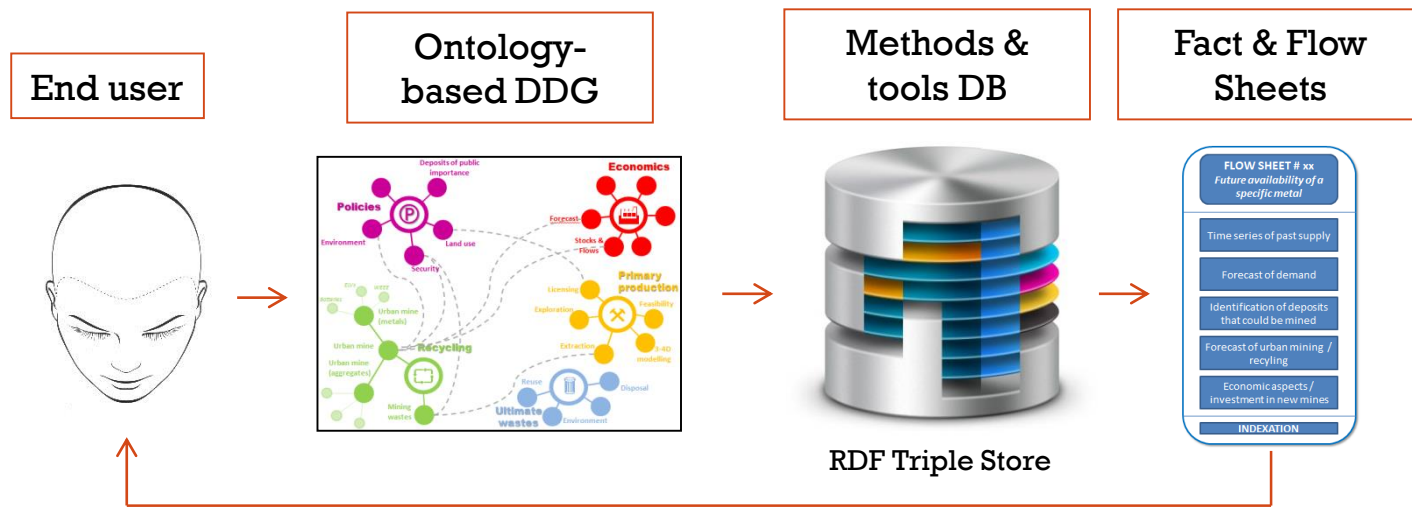


MICA ONTOLOGIES, METADATA, TRIPLE STORE, AND DDG: AN OVERVIEW

WP6: The European Raw Materials Intelligence
Capacity Platform (EU-RMICP)



- **The MICA Main ontology:**
- In MICA, the **Main Multidimensional Ontology** represents the **Domain of questions** an end user may have about Mineral resources / Raw materials.
- It is used for supporting a **Dynamic Decision Graph (DDG)** which allows the end user to navigate & visualize the database content and to search for the most appropriate method(s) and tool(s) to use for resolving his problem.



- A reminder about ontologies

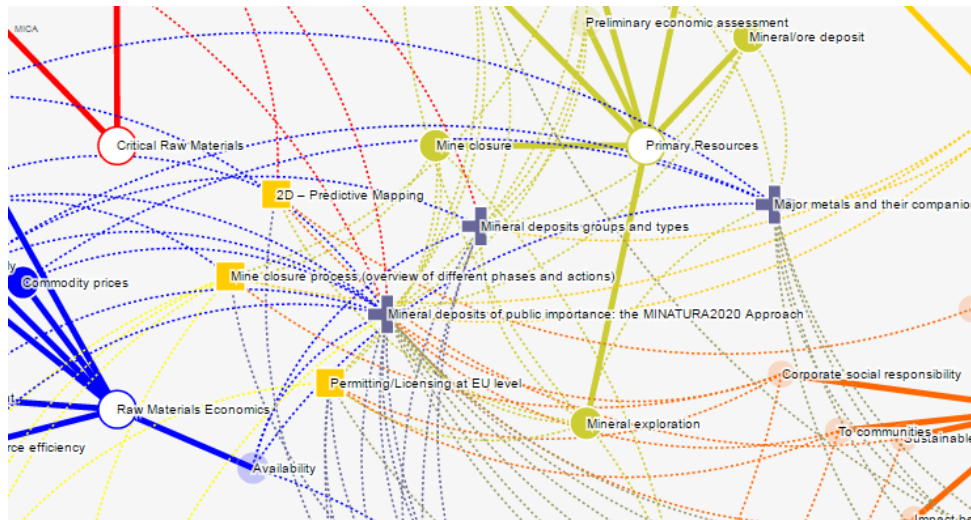
An ontology allows specifying in a formal language (machine understandable) the concepts of a domain of interest (here the raw materials) and their relationships.

(A conceptualization being an abstract, simplified view of the world that we wish to represent for some purpose).

- What is the EU-RMICP and what it is not

- The aim of the EU-RMICP IS NOT to provide the end user with the answer to his/her question/query.
- The objective is, (nearly) whatever the question the end user has in mind, to say him how to proceed to find a solution and to suggest one or several approaches, ranked by pertinence. This includes:
 - DocSheets = information related to the question;
 - FactSheets = methods/tools to apply to find a solution. FacSheets are produced by MICA;
 - LinkSheets = link toward an external and perenial source. Can replace a doc/factSheet;
 - FlowSheets = designed for answering complex queries, they can combine several doc/fact/linkSheets. **ALL THESE SHEETS ARE LINKED TOGETHER AND TO DATA SOURCES**

- What are the rubrics of a factSheet?
- FactSheets and docSheets are annotated with the Main ontology concepts and transversal ontologies
- About 300 sheets (doc/link/fact/flowSheets) prepared by the project



FactSheet

Scope (conceptual model & main characteristics)

....

Range of relevant applications or topics

....

Data needs, databases

....

Model used

....

System and/or parameters considered

....

Time / Space / Resolution / Accuracy

....

Indicators / Outputs / Units

....

Treatment of uncertainty, verification, validation

....

Main publications / references

....


Related methods

....

Key relevant contacts

....

**ANNOTATION with ontologies, EUR-Lex,
dataset sources...**

You are successfully log in. 

Type of sheet:

☒ MICASheet ☐ FlowSheet ☐ LinkedSheet ☐ FAQs

Type of content:

Other 

SELECT OR DROP FILES HERE



Title:

Enter title



Authors:

Daniel Cassard
Jakob Molander
Marie Jeanne NATETE
Matti Petersen

Summary

Enter summary



Select one or several concepts:



Domains

Methods









ValueSupplyChain

Commodities

Temporal

Spatial

Data





- ✓ ☒  MICA
 - > ☒  D1 PRIMARY MINERAL RESOURCES
 - > ☒  D2 SECONDARY MINERAL RESOURCES
 - > ☒  D3 INDUSTRIAL PROCESSING AND TRANSFORMATION
 - > ☒  D4 RAW MATERIALS ECONOMICS
 - > ☒  D5 RAW MATERIALS POLICY & LEGAL FRAMEWORK
 - > ☒  D6 SUSTAINABILITY OF RAW MATERIALS
 - > ☒  D7 INTERNATIONAL REPORTING

Selected concepts:

- *Links between sheets and other resources*
- *Creation of linkSheets and flowSheets*
- *Annotation of linkSheets, flowSheets & questions*

Submit

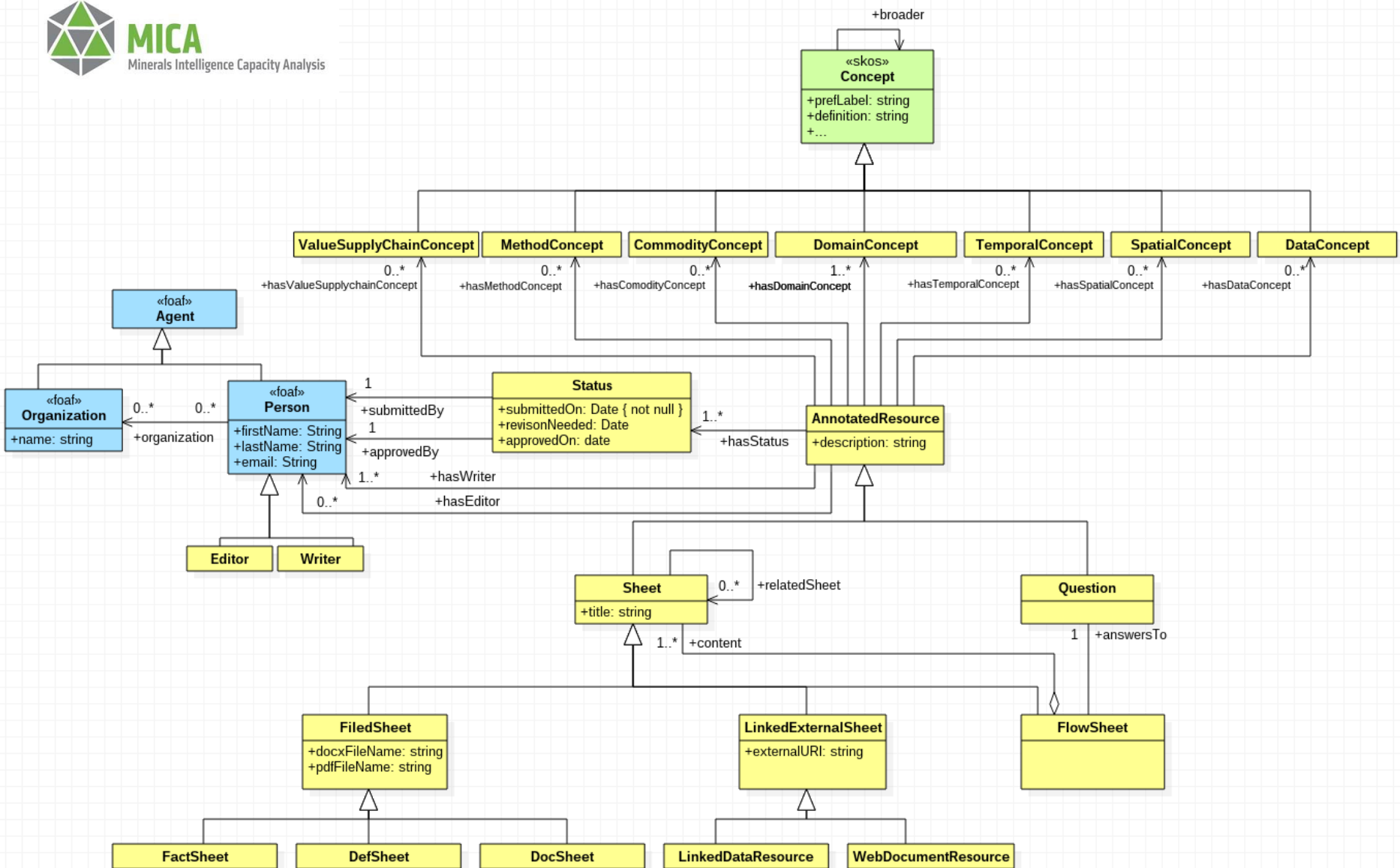
Scheme management

Select	Scheme URI	
<input type="checkbox"/> DomainScheme	https://w3id.org/mica/ontology/MicaOntology/DomainScheme	 
<input type="checkbox"/> ValueSupplyChainScheme	https://w3id.org/mica/ontology/MicaOntology/ValueSupplyChainScheme	 
<input type="checkbox"/> CommoditiesScheme	https://w3id.org/mica/ontology/MicaOntology/CommoditiesScheme	
<input type="checkbox"/> TemporalScheme	https://w3id.org/mica/ontology/MicaOntology/TemporalScheme	
<input type="checkbox"/> SpatialScheme	https://w3id.org/mica/ontology/MicaOntology/SpatialScheme	
<input type="checkbox"/> DataScheme	https://w3id.org/mica/ontology/MicaOntology/DataScheme	
<input type="checkbox"/> MethodsScheme	https://w3id.org/mica/ontology/MicaOntology/MethodsScheme	

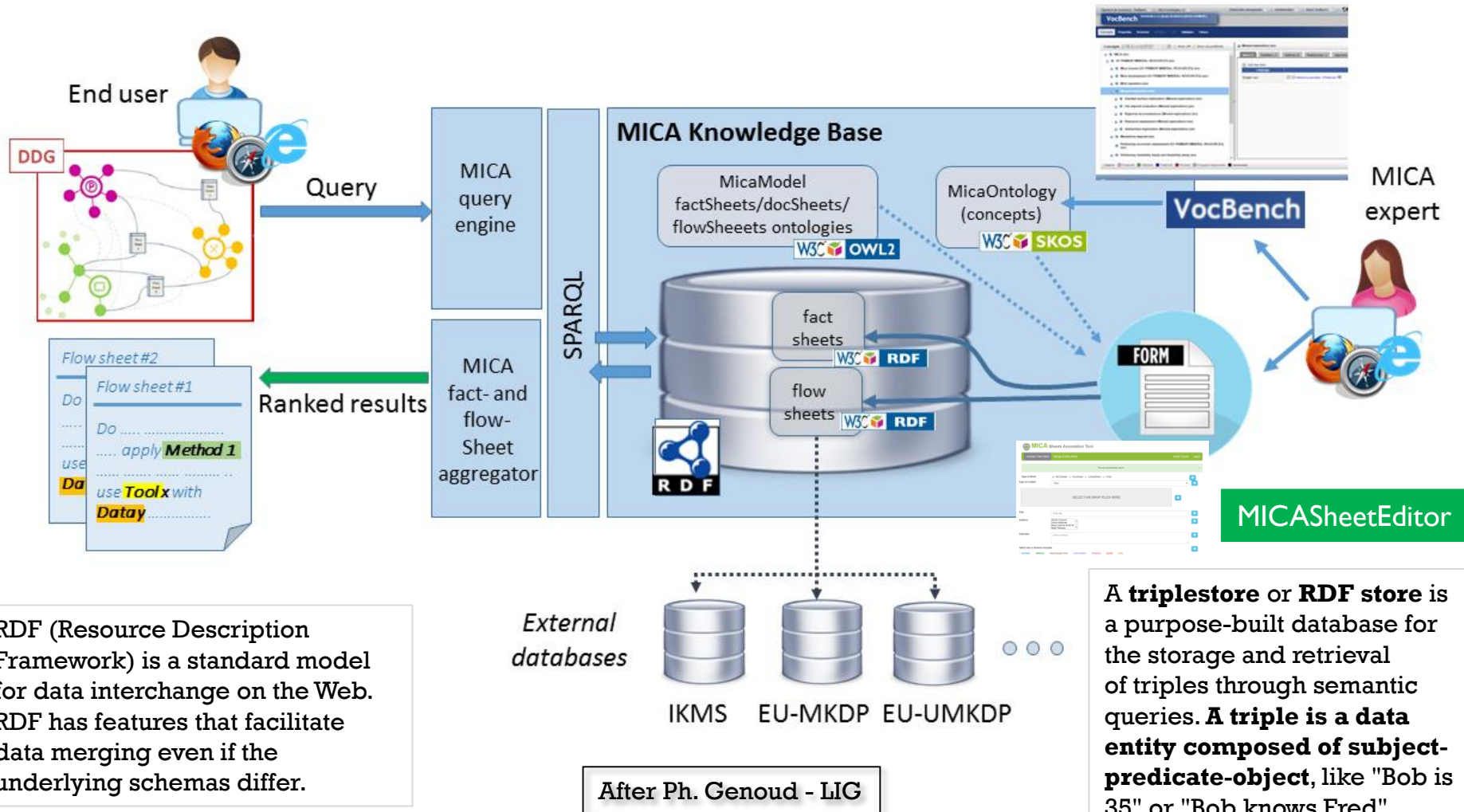
Concepts

- VALUE/SUPPLY CHAIN (en)
- Down-cycling/disposal (en)
- Exploration (VALUE/SUPPLY CHAIN) (en)
- Fabrication (en)
- Manufacturing (en)
- Metallurgy (en)
- Mine development (VALUE/SUPPLY CHAIN) (en)
- Mining (en)
- Packaging (en)
- Pre-feasibility & feasibility (en)
- Preliminary economic assessment (VALUE/SUPPLY CHAIN) (en)
- Recycling (VALUE/SUPPLY CHAIN) (en)
- Refurbishment (VALUE/SUPPLY CHAIN) (en)
- Transport (VALUE/SUPPLY CHAIN) (en)
- Use (en)

The different MICA ontologies are managed (created, improved, updated) using VocBench



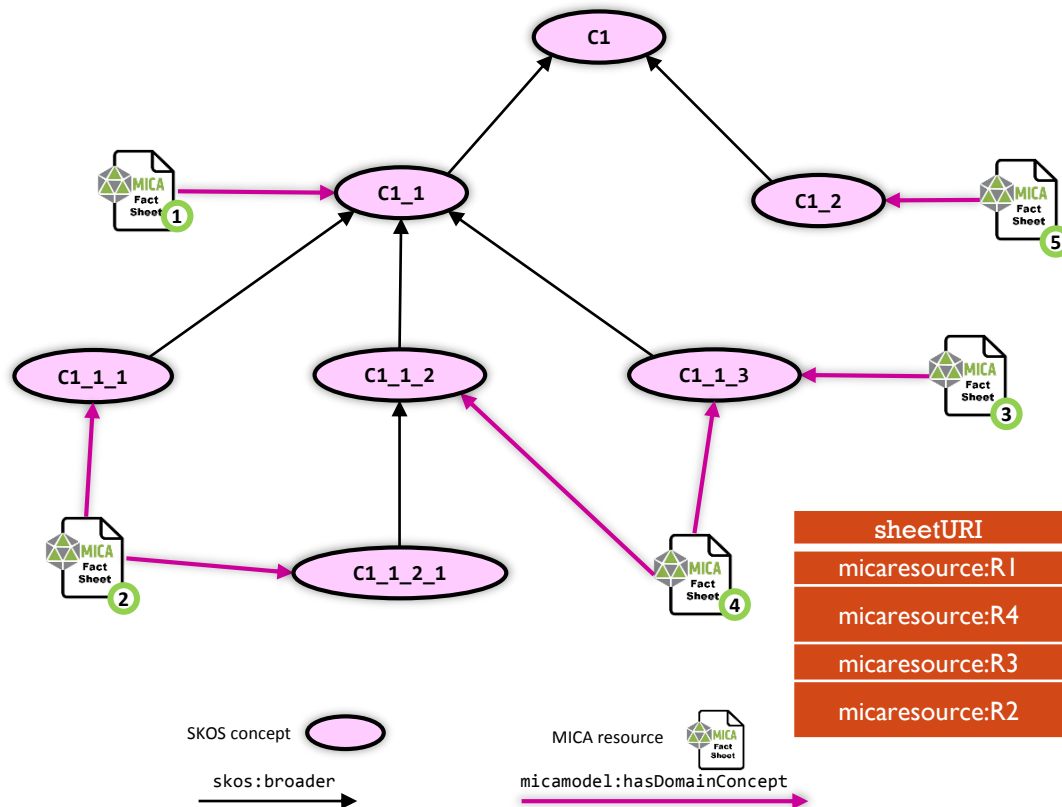
The MICA model used for the design of the RDF Triple Store



RDF (Resource Description Framework) is a standard model for data interchange on the Web. RDF has features that facilitate data merging even if the underlying schemas differ.

A **triplestore** or **RDF store** is a purpose-built database for the storage and retrieval of triples through semantic queries. A **triple** is a **data entity composed of subject-predicate-object**, like "Bob is 35" or "Bob knows Fred".

- Ranking the results of a end user's query using concepts hierarchies



Ranking of the results of the 'C1_1' concept selection.

For every resources we search for the following variables:

- rank = $\min(di)$
- nbMax = $\max(di)$
- nbConcepts = $\text{cardinal}(Ci)$

sheetURI	conceptURIs	rank	nbmax	nbConceptURIs
micaresource:R1	"micavocab:C1_1"	"0"	"0"	"1"
micaresource:R4	"micavocab:C1_1_3; micavocab:C1_1_2"	"1"	"1"	"2"
micaresource:R3	"micavocab:C1_1_3"	"1"	"1"	"1"
micaresource:R2	"micavocab:C1_1_1; micavocab:C1_1_2_1"	"1"	"2"	"2"

MICA Knowledge Base

Mineral Intelligence Capacity Analysis

project will provide stakeholders with the best possible Raw Materials Information, in a seamless and flexible way using the European Union Raw Materials Intelligence Capacity Platform (EU-RMICP).

Revolution in Mineral Intelligence Capacity Analysis



Graph

allows the end user to navigate & visualize the database content and to search for the most appropriate method(s) and tool(s) to use for resolving his problem.



Search

looks into the labels and definitions of available Concepts / FactSheets / DocSheets / Legislation / Data / Question / FlowSheets/ ...



Wizard

guides you through the available concepts. In this way we help you to build a query based on those concepts, that best fit your question.



FAQ

these questions have been collected by the Work Package 2 on Stakeholder consultation. Here we map these questions to Flow Sheets, which can be best described as cooking recipes on how to answer them.



MICA KNOWLEDGE BASE

project will provide stakeholders with the best possible Raw Materials Information, in a seamless and flexible way using the European Union Raw Materials Intelligence Capacity Platform (EU-RMICP).



HELPFUL LINKS

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[Ontology Graph](#)
[Search](#)
[Wizard](#)
[Concepts](#)
[Methods/Tools](#)
[FAQ/FlowSheets](#)
[Favorites](#)

NEWS & EVENTS

[News](#)
[Events](#)
[Brochure](#)
[Poster](#)

Value/Supply:



Nothing selected

Temporal:

Nothing selected

Spatial:

Nothing selected

Commodities:

Nothing selected

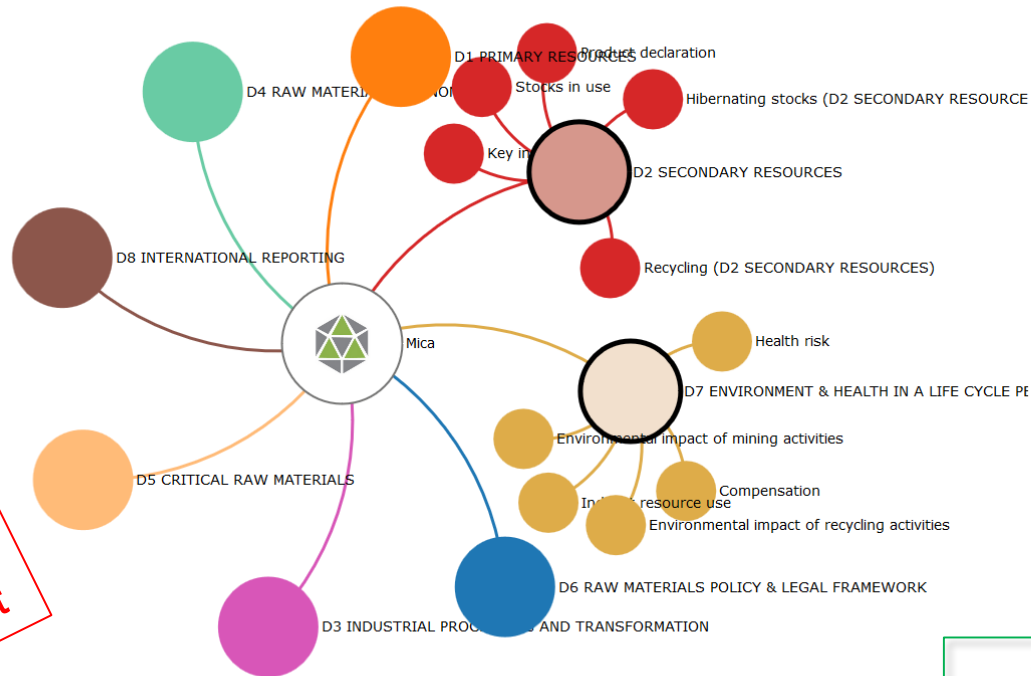
Apply

Reset

Filter the results by drilling down into the Mica Ontologies

D2 SECONDARY RESOURCES

D7 ENVIRONMENT & HEALTH IN A LIFE
CYCLE PERSPECTIVE



Results:

- ☐ FactSheets
- ☐ DocSheets
- ☐ Legislation
- ☐ Data
- ☐ Question
- ☐ FlowSheets

Filter Title

Title

- FactSheet 1 title
- FactSheet 10 title
- FactSheet 11 title
- FactSheet 12 title
- FactSheet 13 title
- FactSheet 14 title
- FactSheet 15 title
- FactSheet 2 title
- FactSheet 3 title
- FactSheet 4 title

Title

Show 10 entries

Showing 1 to 10 of 15 entries

First Previous 1 2 Next Last

Still under
development

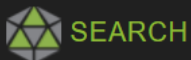
*The DDG and the
window 'Results'*

Search

[HOME](#) > [SEARCH](#)

The search engine looks into the labels and definitions
of available Concepts / FactSheets / DocSheets / Legislation / Data / Question / FlowSheets/ ...

***The Search
capability***



looks into the labels and definitions of available Concepts / FactSheets /
DocSheets / Legislation / Data / Question / FlowSheets/ ...



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11/14/2017

Wizard

Take a tour through the content of the MICA knowledge base, using various pathways, like a guided selection of concepts, a full list of the available methods and tools, and a set of stakeholder generated FAQs.

*The Wizard for
skilled end
users*



Concepts Workflow

guides you through the available concepts. In this way we help you to build a query based on those concepts, that best fit your question.

START



Methods/Tools

provides a list of all methods and tools, which can then be narrowed down and filtered using MICA concepts, commodities etc.

START



FAQ/FlowSheets

these questions have been collected by the Work Package 2 on Stakeholder consultation. Here we map these questions to Flow Sheets, which can be best described as cooking recipes on how to answer them.

START

The Wizard offers 3 different additional approaches for skilled users:

- To select concepts and visualize associated sheets;
- To directly select and visualize methods and tools;
- To go through FAQs



guides you through the available concepts. In this way we help you to build a query based on those concepts, that best fit your question.



HELPFUL LINKS

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Methods/Tools
FAQ/FlowSheets
Favorites

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Methods / Tools

[HOME](#) > [WIZARD](#) > [METHODS / TOOLS](#)

Filter by

Value/Supply Chain:

Nothing selected

Temporal Scheme:

Nothing selected

Spatial Scheme:

Nothing selected

Commodities Scheme:








Nothing selected

Concepts:

Nothing selected

Reset

Apply

-  [DPSIR Framework](#) [Details](#) [Favorite](#)
-  [Delphi Surveys](#) [Details](#) [Favorite](#)
-  [Citizens' panel or Focus Groups](#) [Details](#) [Favorite](#)
-  [Futures Wheel](#) [Details](#) [Favorite](#)
-  [Genius Forecasting](#) [Details](#) [Favorite](#)
-  [Geological Maps](#) [Details](#) [Favorite](#)
-  [Life Cycle Analysis \(LCA\)](#) [Details](#) [Favorite](#)

*Methods and
tools*

*Methods and
tools*

Description:

External link: <https://w3id.org/mica/resource/FactSheetDelphiSurveys>

Related artefacts

FACTSHEETS 0

DOCSHEETS 0

LEGISLATION (EUR-LEX) 0

DATA (WP3) 0

? QUESTION (WP2) 0

DOMAIN CONCEPTS

COMMODITY CONCEPT 0

TEMPORAL CONCEPT 0

SPATIAL CONCEPT 0

METHODS 0



11/14/2017

Frequently Asked Questions / FlowSheets

[HOME](#) >
 [WIZARD](#) >
 [FAQ/FLOWSHEETS](#)

The functionalities are under construction.

Filter by:

Value/Supply Chain:

Nothing selected

Temporal Scheme:

Nothing selected

Spatial Scheme:

Nothing selected

Commodities Scheme:

Nothing selected

Concepts:

Nothing selected

Reset

Apply

Where will we get the substitution material?

[FactSheets](#) 16
 [DocSheets](#) 11
 [Legislation](#) 1
 [Data](#) 0
 [Question](#) 2

FlowSheet

Description: Morbi convallis bibendum urna ut viverra. Maecenas quis consequat libero, a feugiat eros. Nunc ut lacinia tortor morbi consequat libero. Description: Morbi convallis bibendum urna ut viverra.

What is the resource?

How much of commodity?

How much waste?

Which raw materials?

How do designated commodities in region/country x?

Where can we find new deposits of a specific commodity in specific geographic area?

[FactSheets](#) 16
 [DocSheets](#) 11
 [Legislation](#) 1
 [Data](#) 0
 [Question](#) 2

FlowSheet

Description: Morbi convallis bibendum urna ut viverra. Maecenas quis consequat libero, a feugiat eros. Nunc ut lacinia tortor morbi consequat libero. Description: Morbi convallis bibendum urna ut viverra.

How does the production of major metals affect the production of companion metals?

How do I know that my supply chain/product is conflict free?

The FAQs

Where will we get the substitution material?

[FactSheets](#) 16
 [DocSheets](#) 11
 [Legislation](#) 1
 [Data](#) 0
 [Question](#) 2

FlowSheet

Description: Morbi convallis bibendum urna ut viverra. Maecenas quis consequat libero, a feugiat eros. Nunc ut lacinia tortor morbi consequat libero. Description: Morbi convallis bibendum urna ut viverra.

11/14/2017

In practice, the collaboration between the EU-UMKDP and the EU-RMICP can work in two complementary ways, **for the mutual benefit of the two platforms:**

- ➔ The EU-UMKDP will appear as a referenced data source for the urban mine in the DDG;
- ➔ The EU-RMICP could improve its capacity to answer regarding the urban mine:
 - if it is feeded with dedicated fact- and docSheets prepared by the ProSUM team and
 - if the perimeter and the granularity of its Main Ontology are augmented for the urban mine.

As fact- and docSheets are annotated with concepts, other sheets, references, metadata related to data sources, the EU legislation, etc., contributing to the EU-RMICP would also contribute to make the EU-UMKDP the REFERENCE SOURCE for the Urban Mine.



THANKS A LOT FOR YOUR ATTENTION!

