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Minerals4EU – INSPIRE in action: Pan-european Raw Materials knowledge base data platform

INSPIRE conference 2015, Lisbon

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Outline

- The Minerals4EU project
 - The EU-MKDP system
 - What does it look like to the user?
 - Status (services, data, know-how)
-

The Minerals4EU project

- EU strategies and initiatives on Raw Materials
 - Raw Materials Initiative, EU Minerals Intelligence Network, EIP RM
 - Consortium
 - 31 partners, GTK (Finland) coord., 24 Geological Surveys, JRC, ...
 - Total budget: 2M €
 - 2 years (2013 – 2015)
 - Main outcomes:
 - The EU-MKDP, Minerals Yearbook and Foresight Studies.
 - Previous and related projects:
 - ProMine, EuroGeoSource, EURare, ProSum, (EGDI), (Mica)
-



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The EU-MKDP system

- Purpose
 - Provide *harmonized INSPIRE compliant* webservice containing mineral resource information to the European community
 - Build an *maintainable infrastructure* that can be regularly updated after the Minerals4EU project
 - Give domain experts *easy access* to visualization and analysis of raw data (portal)

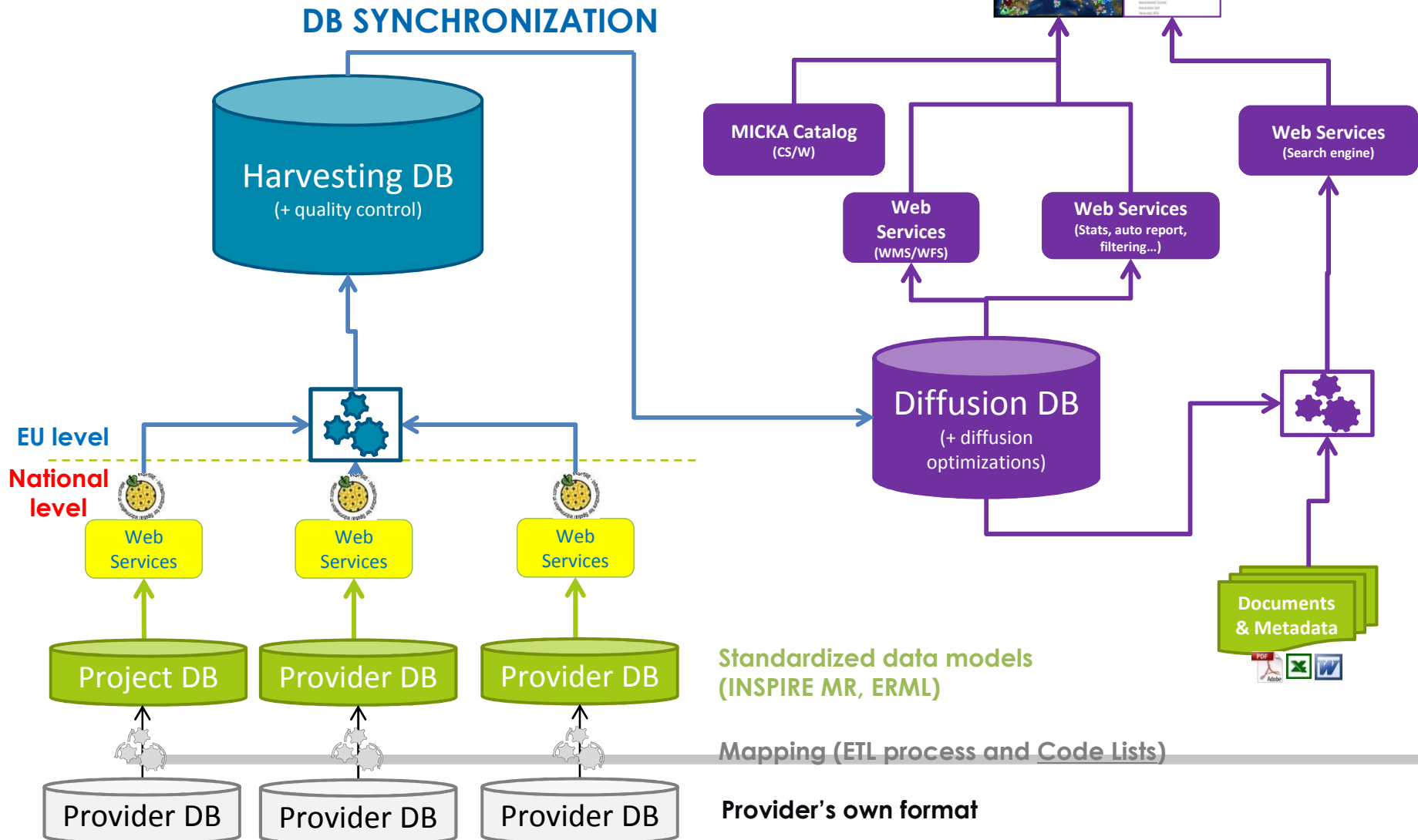
 - Overall architecture
-



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EU-MKDP architecture





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The EU-MKDP system

- Purpose
 - Overall architecture
 - Standards used
 - INSPIRE Mineral Resource Core
 - Mineral Occurrence, Ore Measure, Commodity, Resource, Reserve, Exploration Activity, Mine, ...
 - INSPIRE Mineral Resource Extension
 - Mining Waste, Mining Product, ...
 - Project specific extensions
 - Geochemical Analyses, ...
 - About code lists
-



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About code lists

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Minerals Intelligence Network for Europe – Minerals4EU

WP5: Common terminology for Minerals4EU - draft

Title of the project:	Minerals Intelligence Network for Europe – Minerals4EU
Grant Agreement number:	608921
Funding Scheme:	FP7-NMP-2013: 4.1-3 –CSA (COORDINATING)
Start date:	01.09.2013
Duration:	24 months
Document title:	Code Lists proposal for Minerals4EU
Workpackage:	WP5
Date:	10.06. 2014
Author(s):	Chris Schubert (EC-JRC), Jouni Vuollo (GTK), Robert Tomas (EC-JRC), Daniel Cassard (BRGM), and WP5 Partners
Date of delivery:	30.09. 2014
Annexes:	
Dissemination level:	PU/PP/RE/CO ¹
Reviewed by:	WP5 partners
Status of the document:	Draft / Final
Document location:	Folder: Minerals4EU/Work Package 5/All documents
Project web site:	https://vyvi-some2.vy-verkko.fi/gtk/Minerals4EU

IR are the base.

the terms proposed by

INSPIRE Maintenance

ResourceML

Common
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The EU-MKDP system

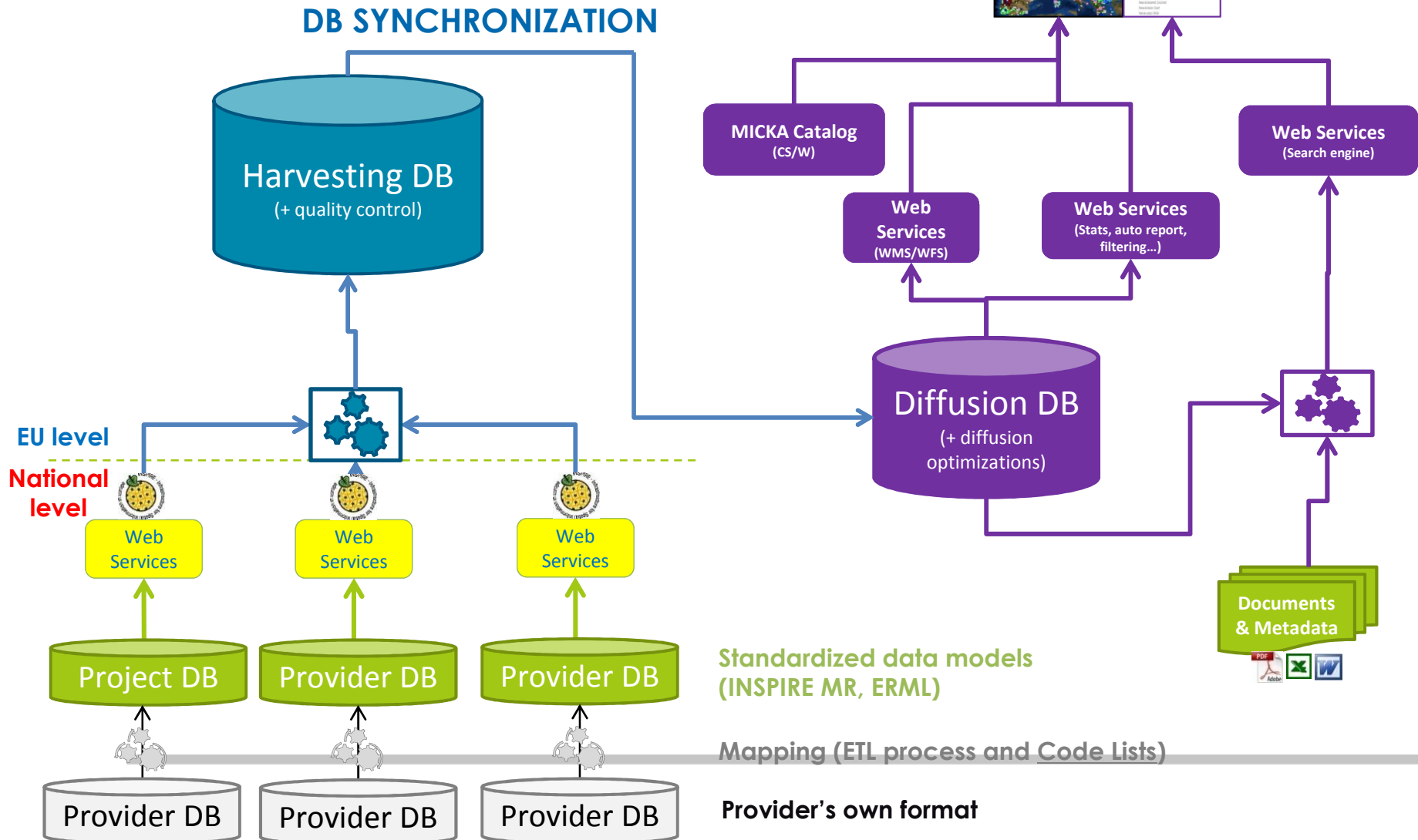
- Purpose
 - Overall architecture
 - Standards used
 - Details of the system
 - The National level
 - Data provider's own database/files
 - Harmonized relational database. PostGreSQL.
 - UML, tables and views
 - ETL-proces
-



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EU-MKDP architecture



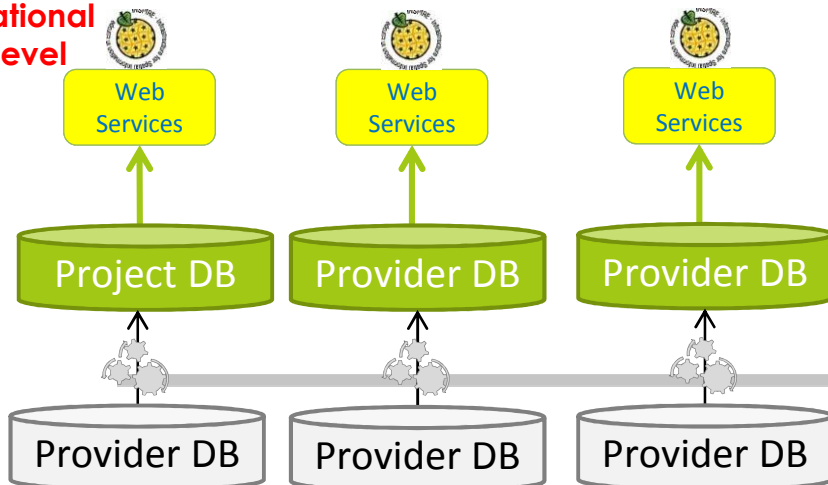


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EU level

National level



Standardized data models (INSPIRE MR, ERML)

Mapping (ETL process and Code Lists)

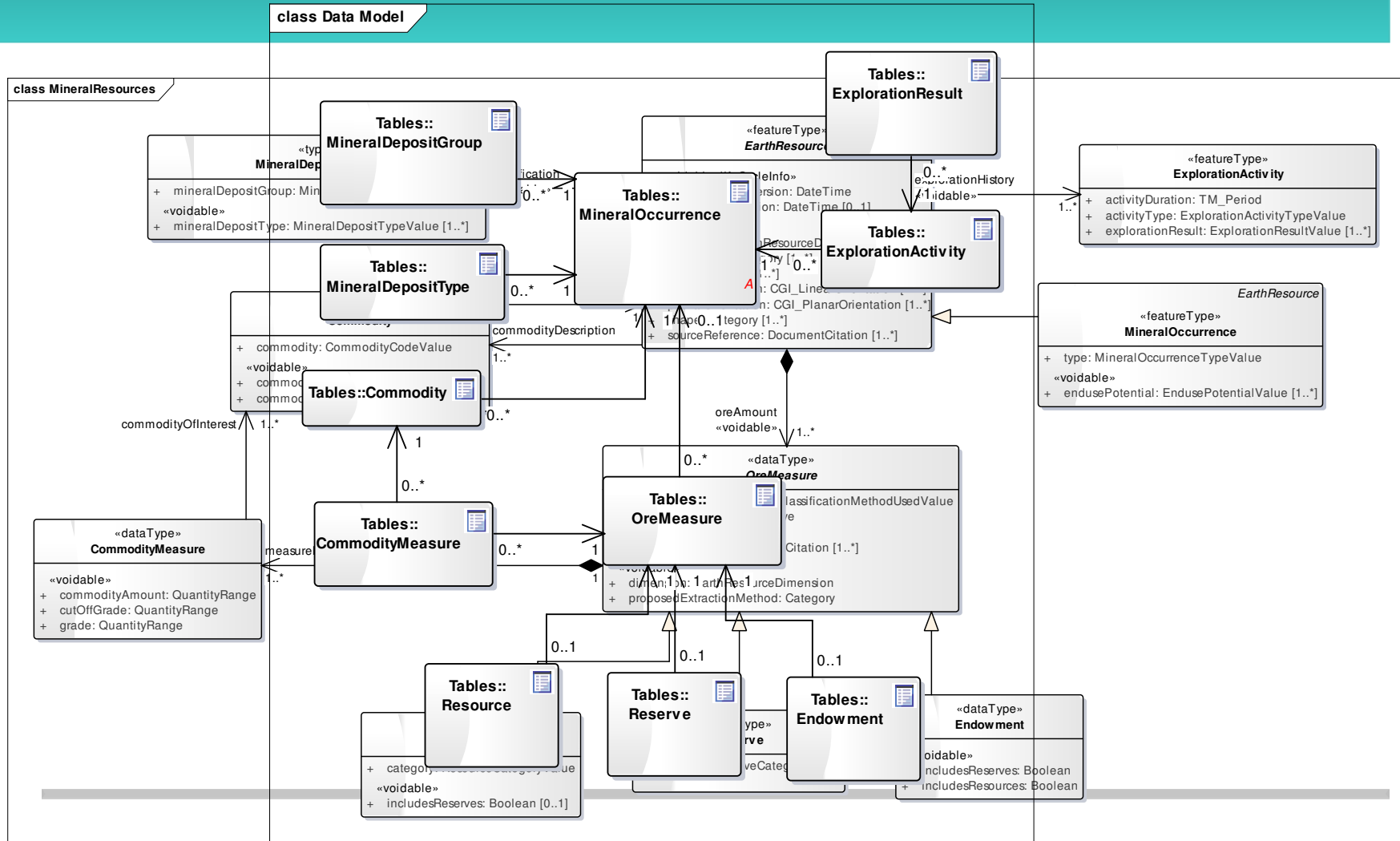
Provider's own format



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From UML to database





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From UML to database

- Subclasses generally implemented either as separate tables or combined into one.
 - INSPIRE recommends that each attribute which can be Voidable must have a corresponding VoidReason.
 - The same goes for relations that are "Voidable" (missing child records).
 - Each Voidable column has corresponding VoidReason column the following legal codes: unpopulated, unknown and withheld.
-



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M4EU codelists	INSPIRE	
voidReason		
Code	name	description
unpopulated	unpopulated	The property is not part of the dataset maintained by the data provider. However, the characteristic may exist in the real world. For example when the —elevation of the water body above the sea levelll has not been included in a dataset containing lake spatial objects, then the reason for a void value of this property would be '_Unpopulated'. The property receives this value for all spatial objects in the spatial data set.
unknown	unknown	The correct value for the specific spatial object is not known to, and not computable by the data provider. However, a correct value may exist. For example when the —elevation of the water body above the sea levelll of a certain lake has not been measured, then the reason for a void value of this property would be '_Unknown'. This value is applied only to those spatial objects where the property in question is not known.
withheld	withheld	The characteristic may exist, but is confidential and not divulged by the data provider.



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The EU-MKDP system

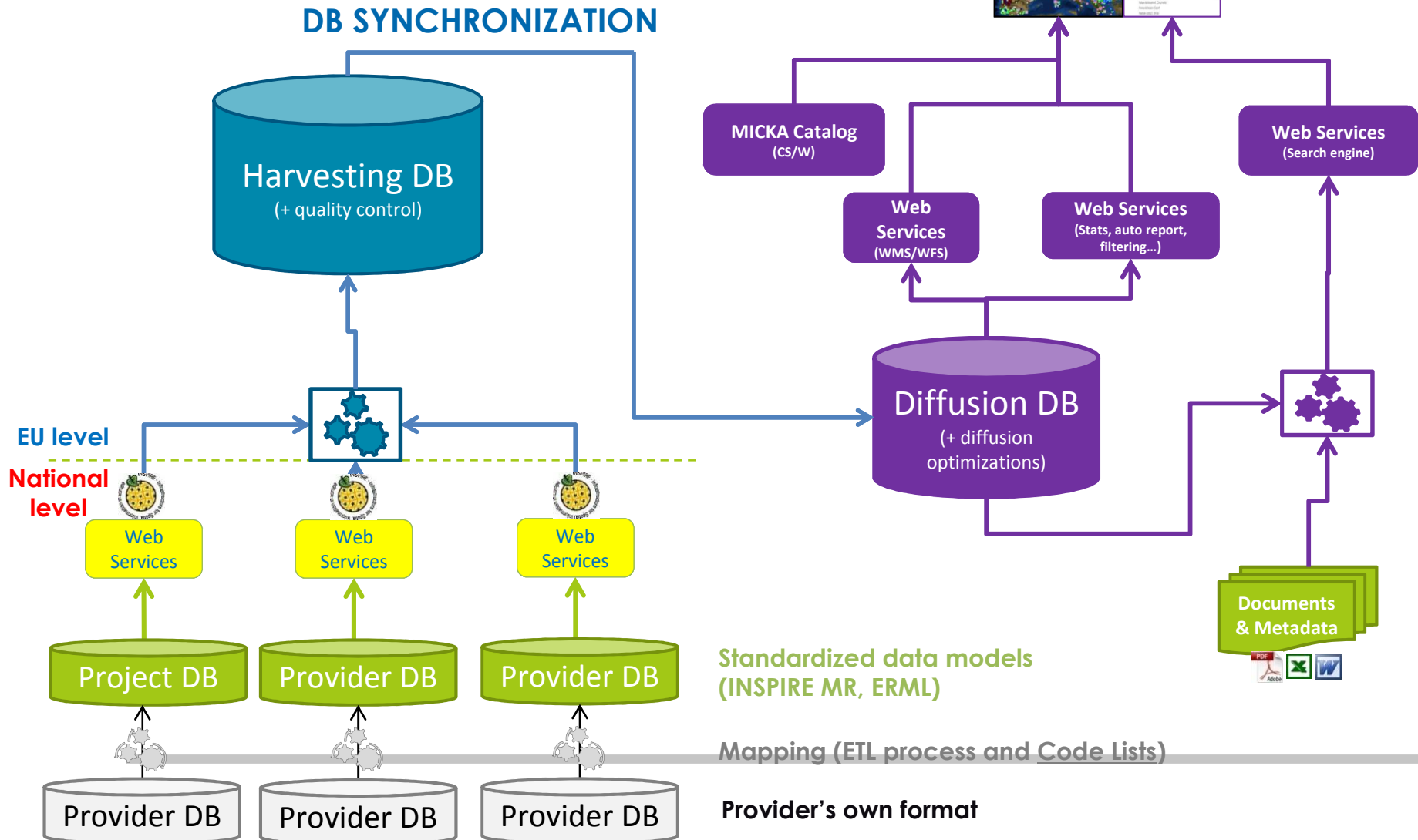
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 - The National level
 - National to Harvesting level
 - WFS
-



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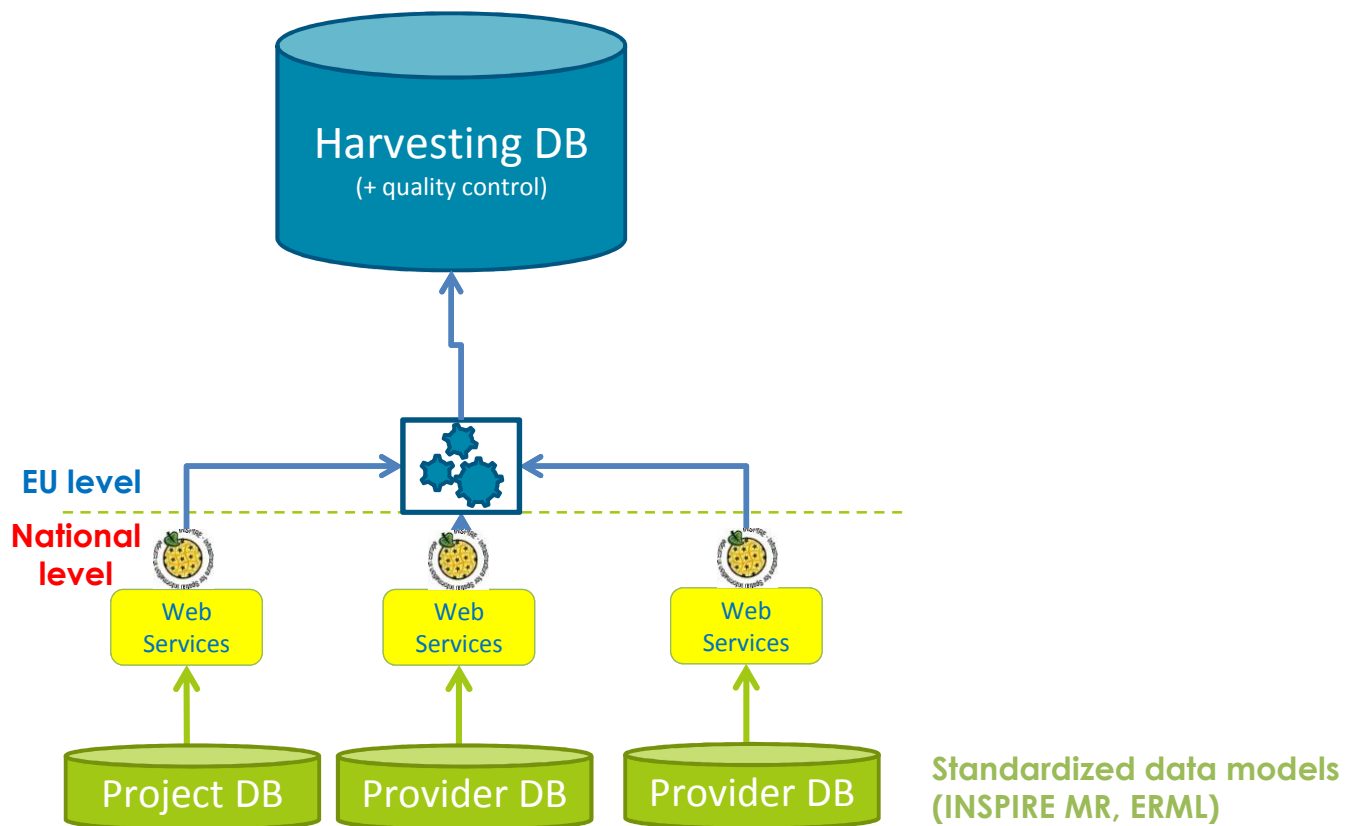


EU-MKDP architecture





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□ WFS

- Deegree used to generate WFS
 - Reads from views in the PostgreSQL databases for instance for decoding of codes. Otherwise Deegree cannot produce INSPIRE compatible WFS.
 - Voidables provided problems:
 - Deegree generates redundant nil-elements when VoidReason is specified:

```
<mr-core:oreAmount nil="true"/>  
<mr-core:oreAmount nil="true" voidReason="unknown"/>
```
 - The Deegree Project was not capable/willing to solve the problem right away.
-



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The EU-MKDP system

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 - Harvesting level
-



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Harvesting level

- Harvesting system
 - Harvester
 - Originally GeoKettle was used. Could not solve issue with redundant nil-elements generated by Deegree
 - Instead JAXB in combination with JDK and NetBeans IDE was used.
 - Provides a cross-platform solution.
 - Harvesting database
 - PostgreSQL with same structure as databases at National Level.
-



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The EU-MKDP system

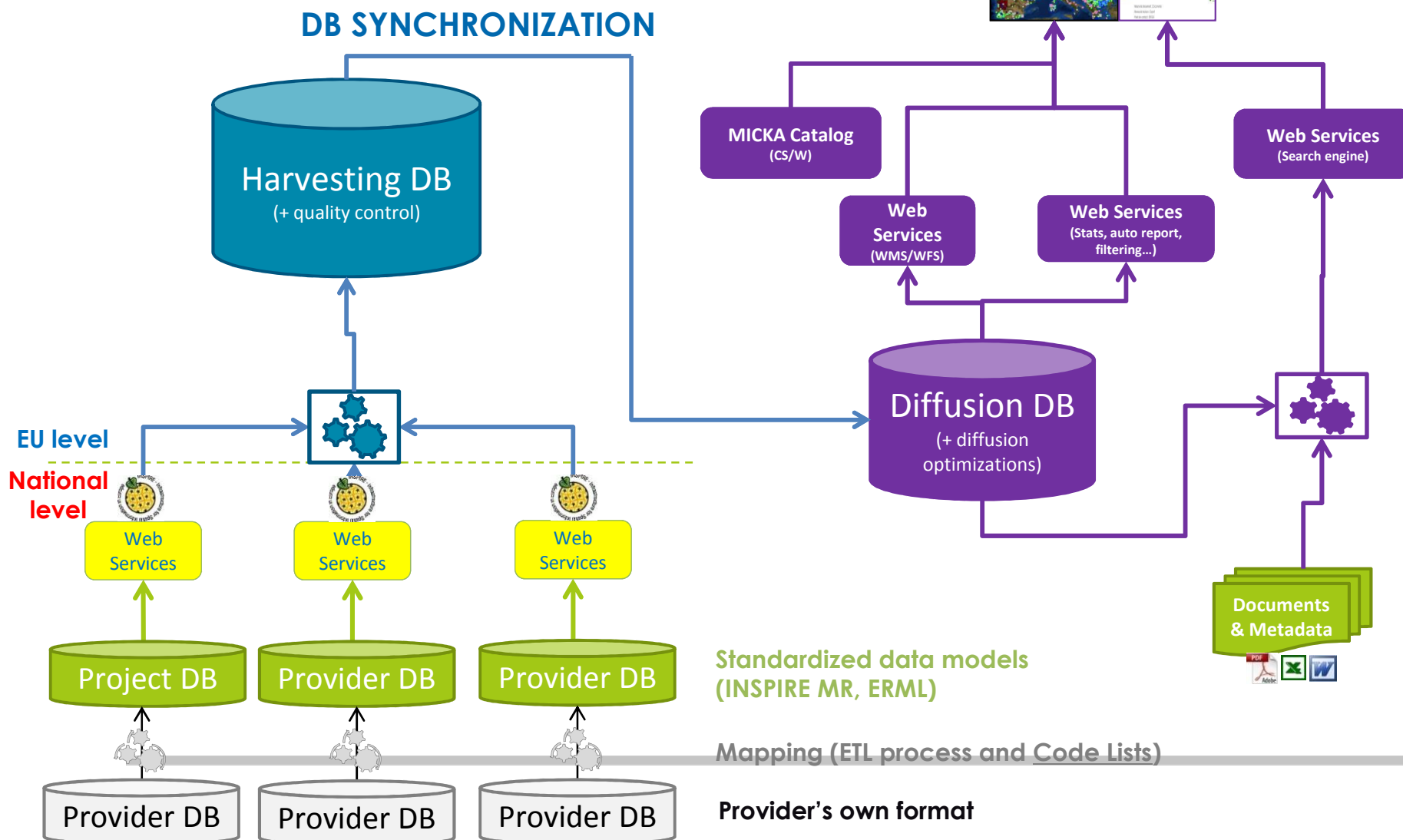
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 - Harvesting level
 - From Harvesting to Diffusion level
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EU-MKDP architecture

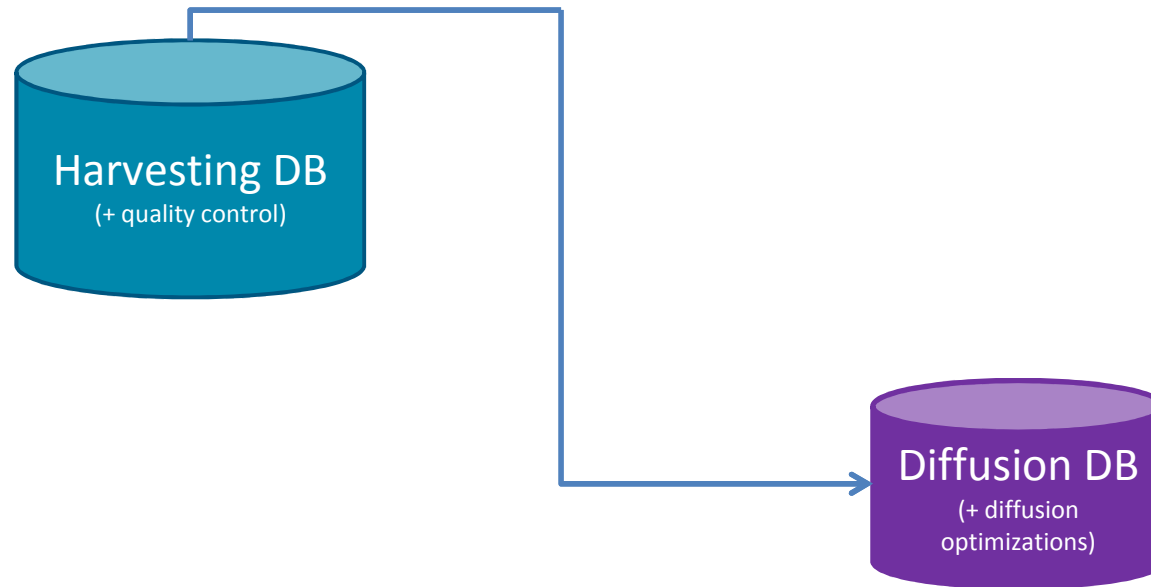


Standardized data models (INSPIRE MR, ERML)

Mapping (ETL process and Code Lists)

Provider's own format

DB SYNCHRONIZATION





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From Harvesting to Diffusion level

- Diffusion database
 - Same structure as harvesting database PLUS:
 - Aggregating views. For instance putting all CommodityMeasures for one MineralOccurrence into one field making it easier to display this information in a GetFeatureInfo request.
 - Pre-computed tables
 - For better performance when GetFeatureInfo is requested by avoiding joins between a lot of tables.
 - To compute polygons for MineralOccurrences that are only provided as points or lines.
 - To compute aggregated texts to be displayed in GetFeatureInfo.
 - Simple PostGreSQL dumps used to transfer data from Harvesting database to Diffusion database.
-



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The EU-MKDP system

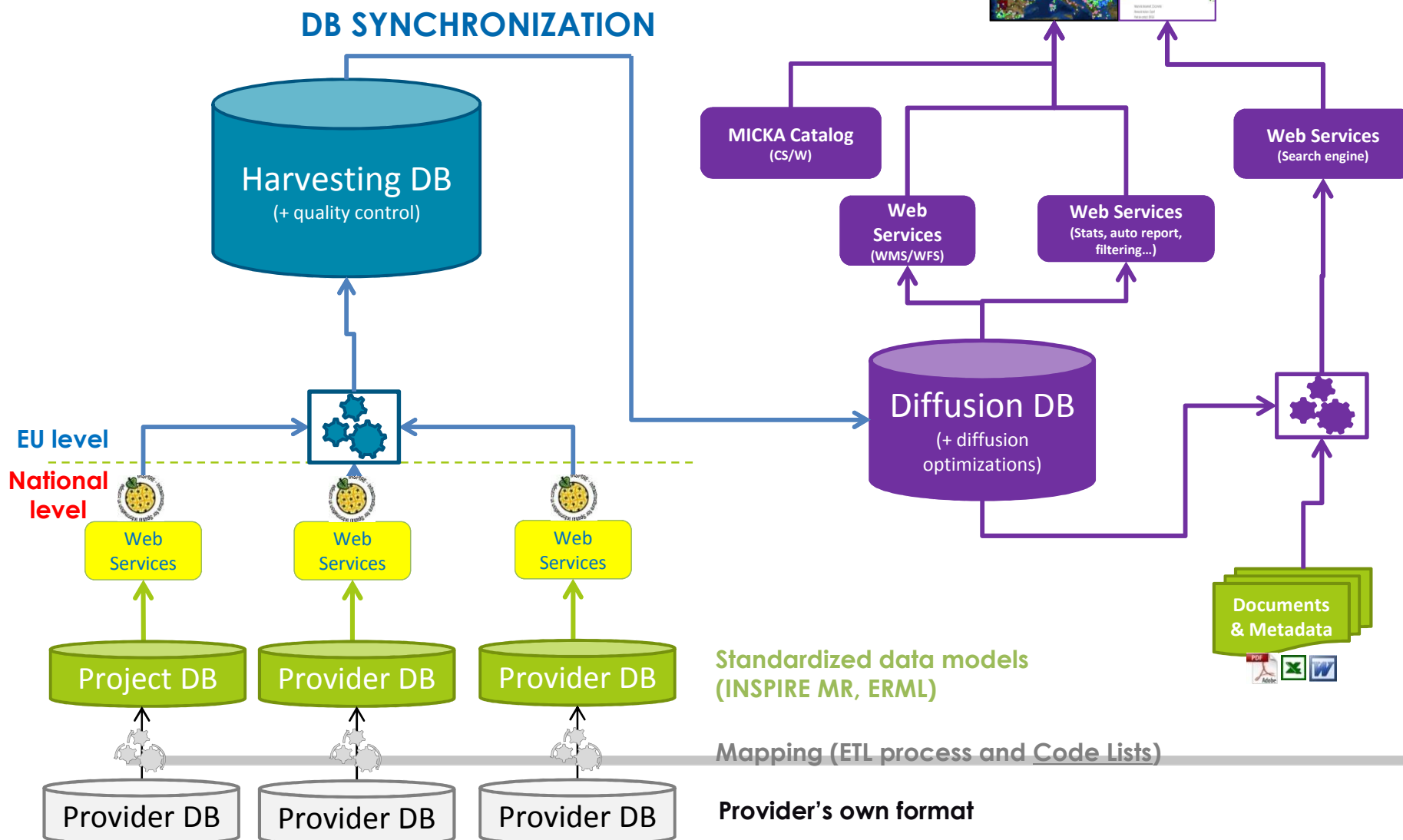
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 - Diffusion Level
-



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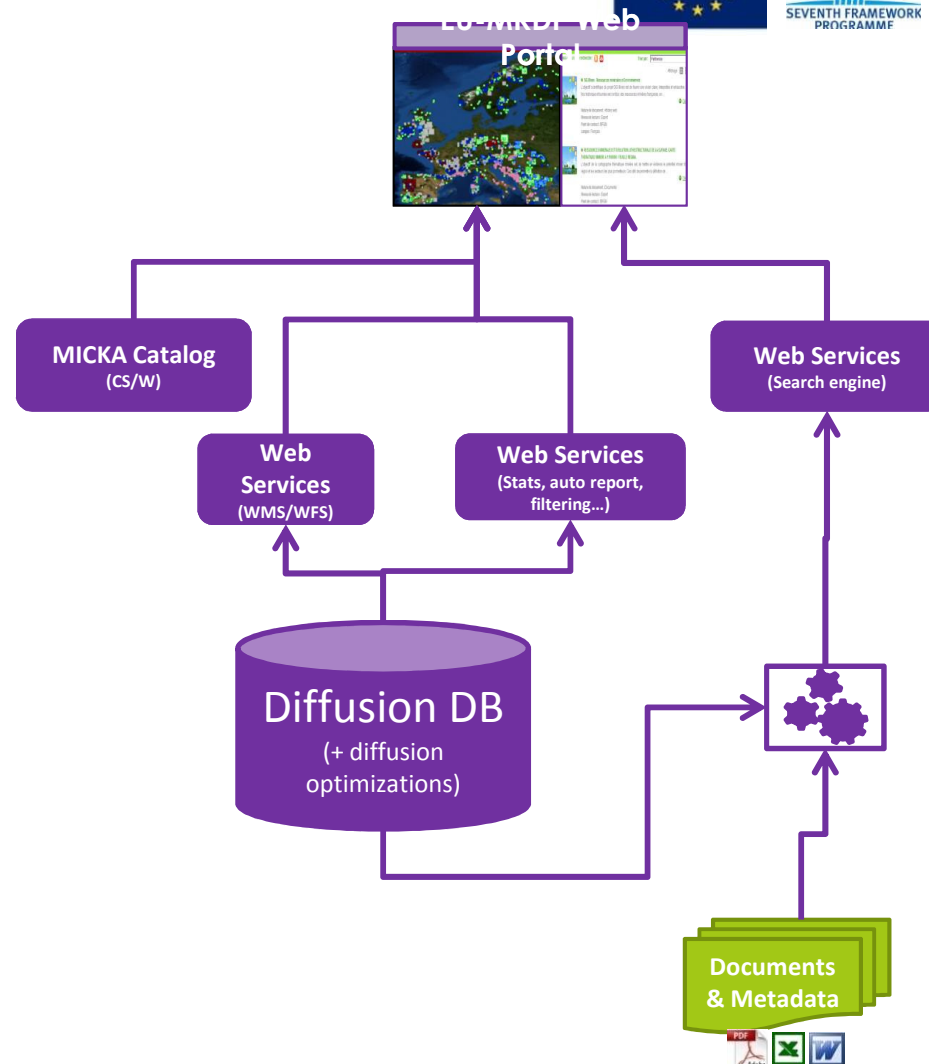


EU-MKDP architecture





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Micka Metadata catalogue

- ❑ Central access point to metadata concerning European mineral resources and related topics
 - ❑ Fully compliant with international standards
 - ❑ Only digital and structured information to be described by metadata in this catalogue (spatial datasets and data services - WMS, WFS etc.)
 - ❑ Function:
 - ❑ Metadata search
 - ❑ Metadata input / edit in a standardized format
 - ❑ Metadata harvesting
 - ❑ Catalogue Service for Web (CS-W 2.0.2.), XML
-



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What does it look like to the user



HOME

DATA SEARCH

MAP VIEWER

The screenshot displays the M4EU map viewer interface. The main map shows France with numerous brown circular markers representing mineral occurrences. The interface includes several panels:

- ACTIVE LAYERS:** A panel on the right side of the map showing three active layers: 'Mines', 'Mineral occurrences, by type', and 'World'. Each layer has a checked checkbox, a blue slider, and a close button (X).
- GET INFORMATION:** A popup window in the bottom-left corner providing details for a specific mineral occurrence (Country: FR) - FRA-00271. It includes a description: "prospect : An area that is a potential site of mineral deposits, based on preliminary exploration, previous exploration. A geologic or geophysical anomaly, especially one recommended for additional exploration." and a list of commodities: baryte, copper, indium, lead, silver, and zinc.
- Navigation and Tools:** A toolbar at the top of the map area contains icons for home, search, zoom in, zoom out, pan, and other map navigation functions.



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Status and conclusions

- 26 countries are now creating metadata and WFS' to serve INSPIRE compliant data with extended information: Big EU level harmonization and capacity building.
 - The Minerals data model is VERY complex, but manageable.
 - Issues with certain tools.
 - <http://minerals4eu.brgm-rec.fr/minerals4EU/> can be inspected but please note that the project is still running...
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Thank you for your attention

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