Global architecture of the EEA data information system

InfoRAC visit 2017

Jan Bliki, Copenhagen 19-21 April 2017

Producing European datasets

Countries deliveries

33 countries
XML, SHP, GML, KML, CSV, Access, etc...

European datasets

80+ European Datasets

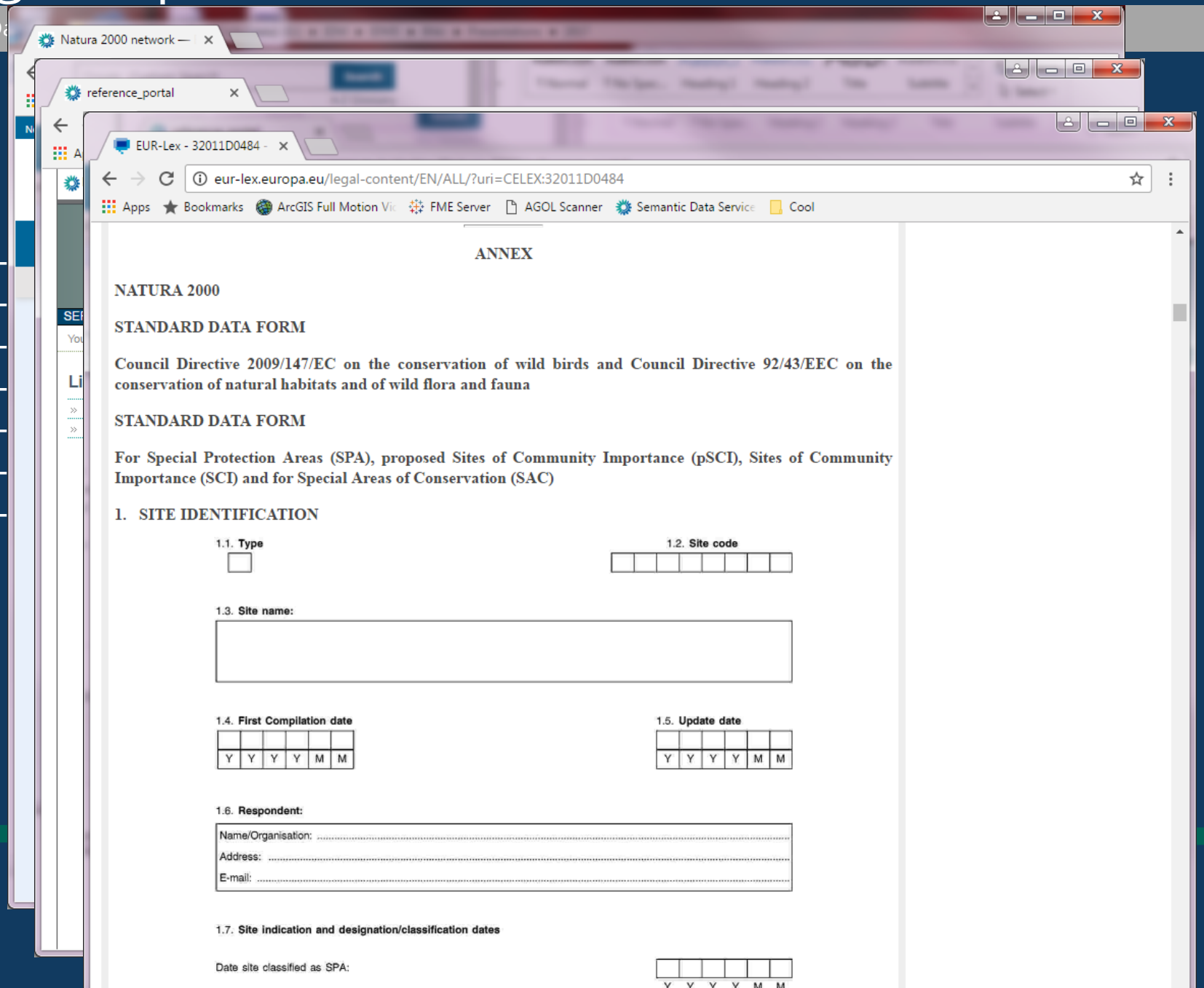
European products

Downloads,Web sites,applications

Producing European datasets

Data planning

Data flow preparation

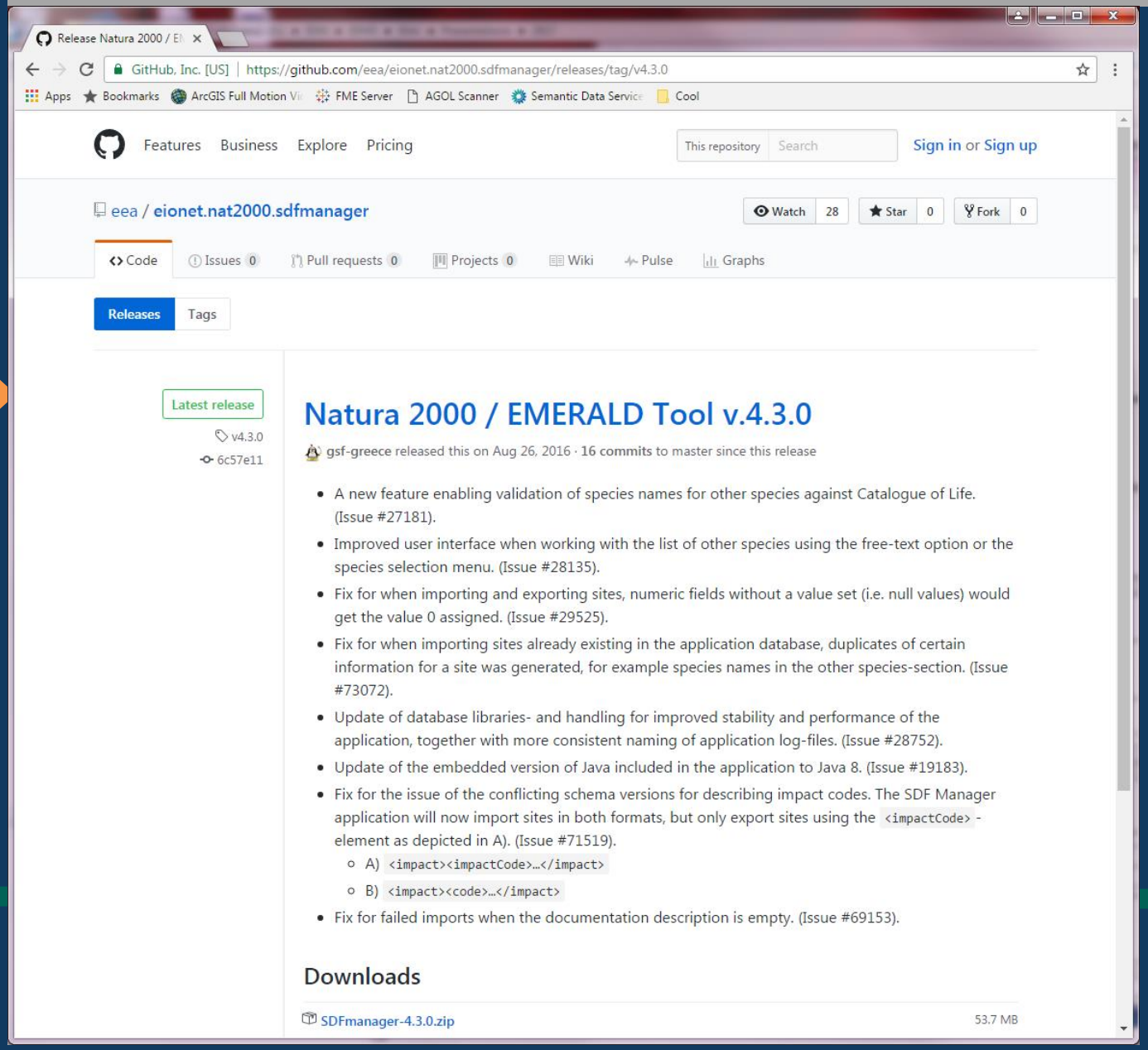


Producing European datasets

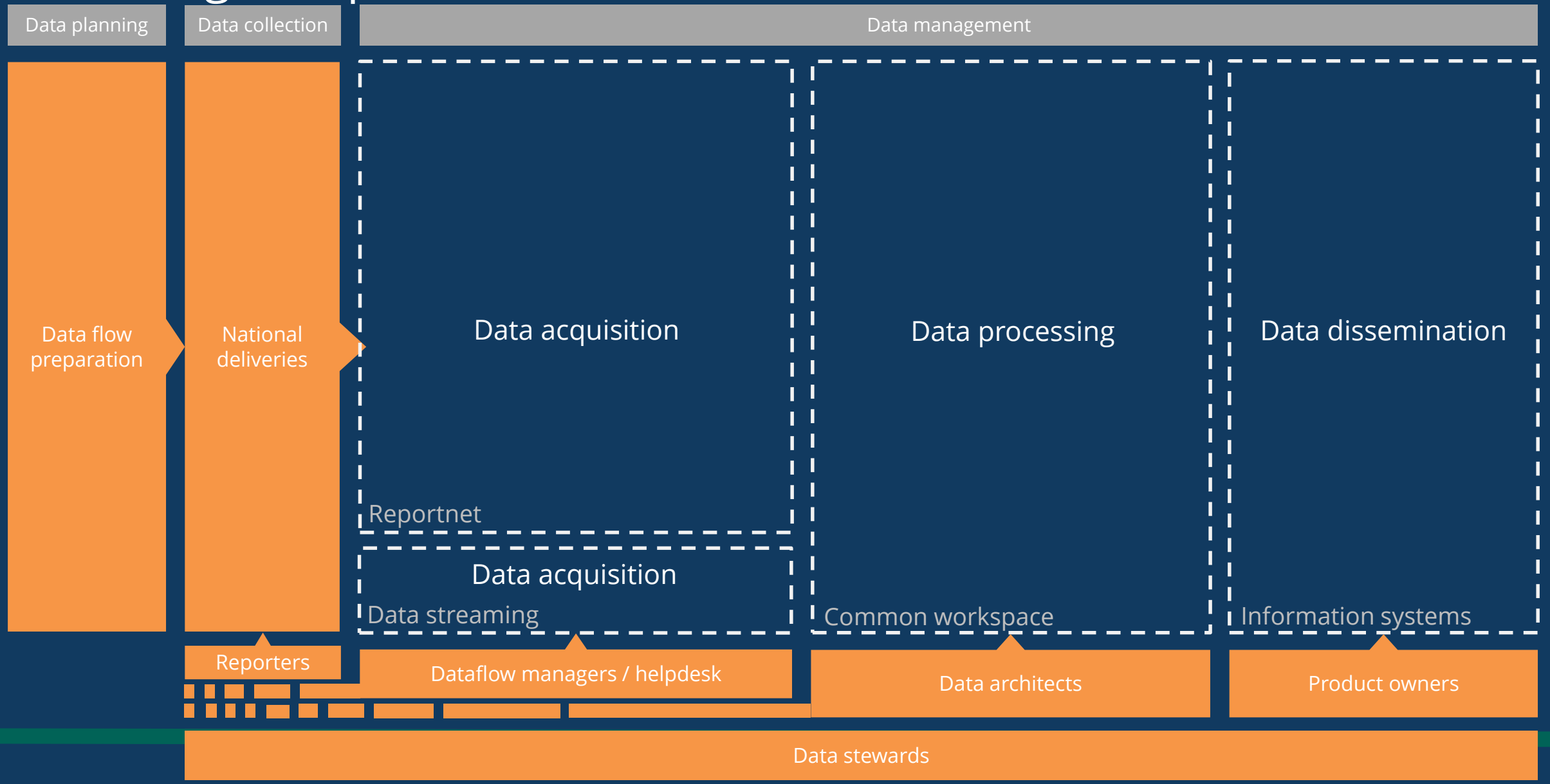
Data planning | Data collection | Data management

Data flow preparation

National deliveries

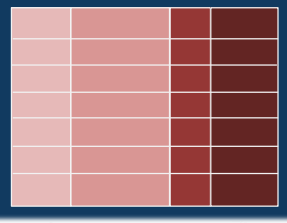


Producing European datasets

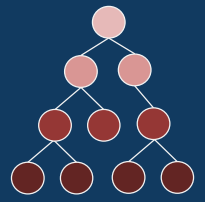


Examples of data structures

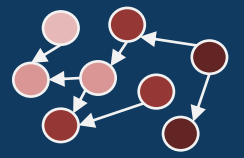
Relational

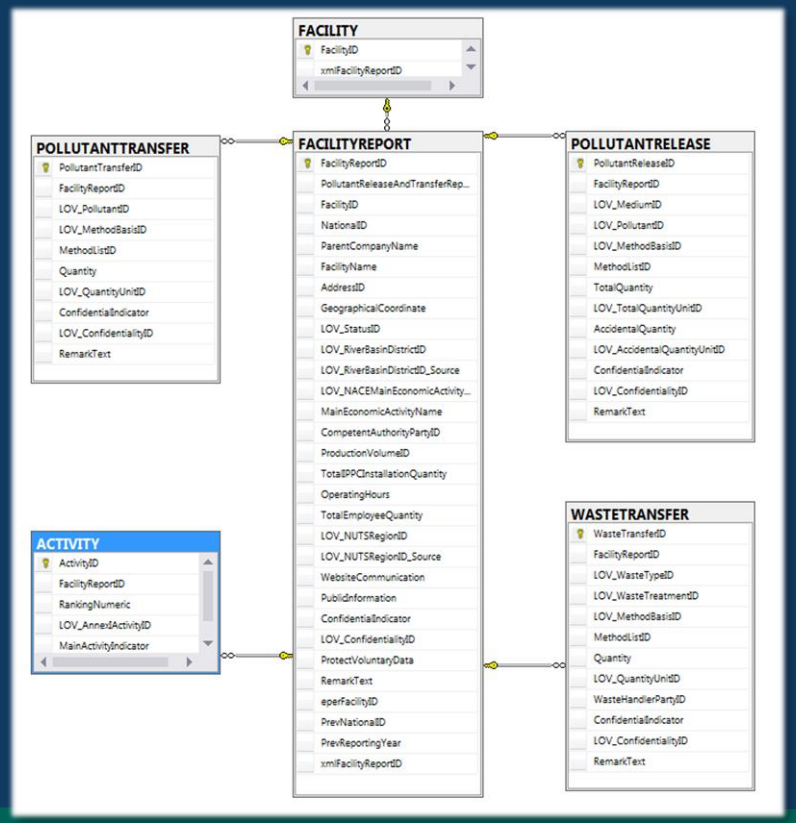


Document



Graph



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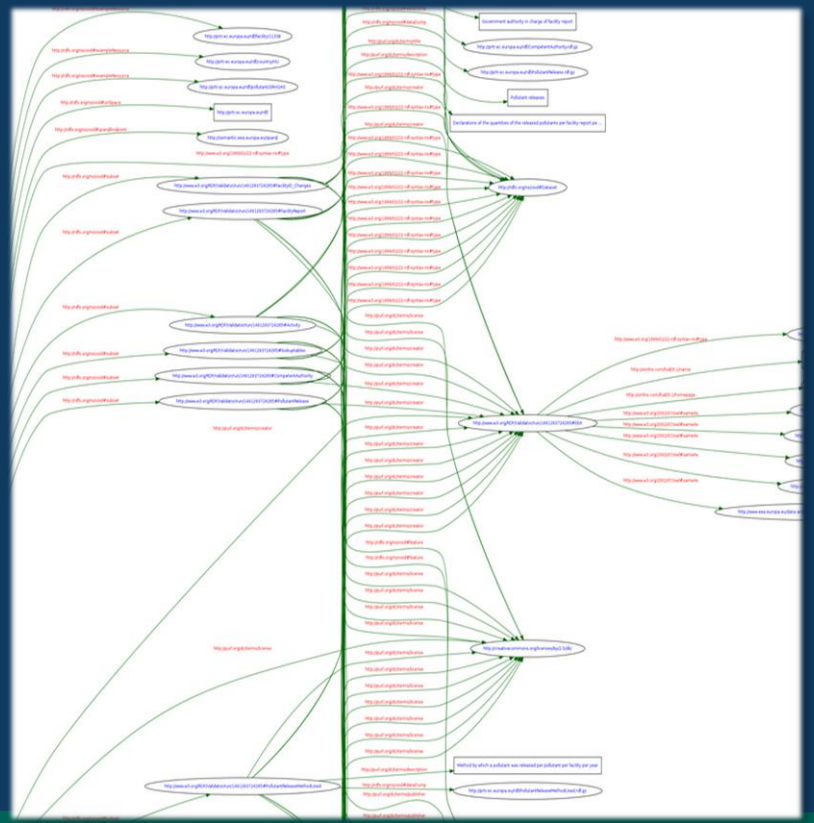

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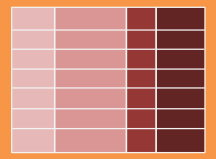
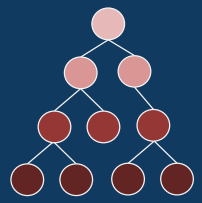
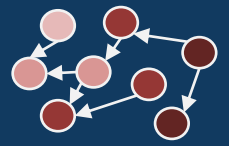


Data acquisition

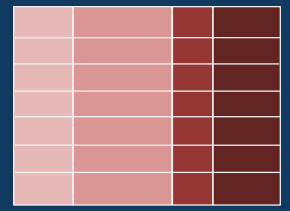


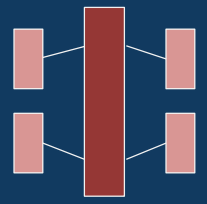


Reportnet

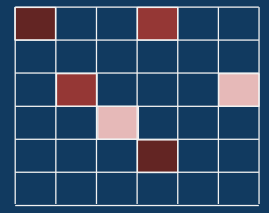
Data acquisition

Data streaming

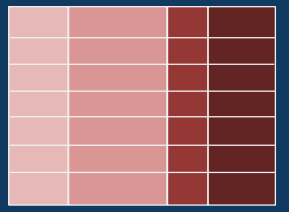




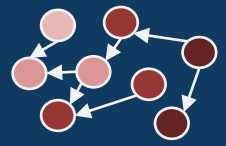
Data processing



Common workspace



Data dissemination



Information systems

Reporters

Dataflow managers / helpdesk

Data architects

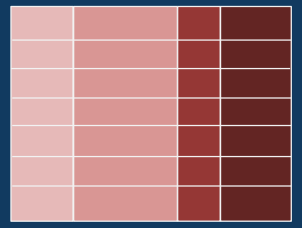
Product owners

Data stewards

European Environment Agency

Database types in EEA

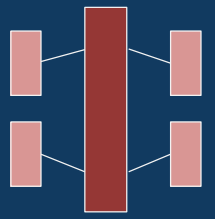
Relational



- Data is usually stored in row by row manner (row store)
- Standardized query language (SQL)
- Data model defined before you add data
- Joins merge data from multiple tables
- Results as tables

Pros: Mature ACID transactions with fine-grain security controls
Cons: Requires up front data modeling, does not scale well.
Example: Microsoft SQL Server, PostgreSQL, MySQL, SQLLite

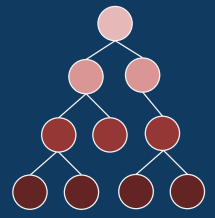
Analytical



- Based on “Star” schema with central fact table for each event.
- Optimized for analysis of read-analysis of historical data
- Common query language easy to implement.

Pros: Fast queries for large data
Cons: Not optimized for transactions and updates.
Example: Microsoft Analysis Server, OLAP, Tableau

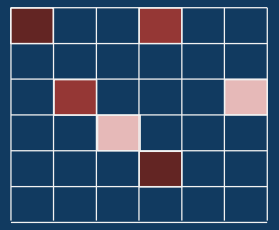
Document



- Data stored in nested hierarchies (XML, JSON)
- Logical data remains stored together as a unit
- Any item in the document can be queried
- Roughly equivalent to the programming concept of an object

Pros: No object-relational mapping layer, ideal for search
Cons: Complex to implement, strong contrast to relational databases
Example: Microsoft DocumentDB, Elastic search

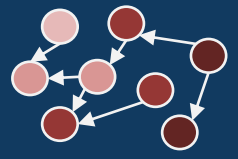
Grid - based



- Data stored in cells with a spatial position
- Transfers spatial data into tabular form
- Relates data that has only spatial relationships

Pros: Scalable and performing
Cons: Needs a spatial reference and from the same spatial scale.

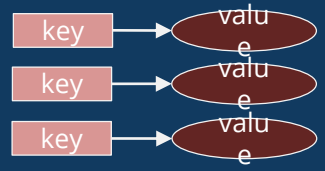
Graph



- Data stored in a series of nodes and properties
- Queries are really graph traversals
- Ideal when relationships between data is key. (ex. Social networks)

Pros: Fast network search, works with public linked data sets
Cons: Poor scalability when graphs don’t fit into RAM, specialized query language.
Example: Virtuoso

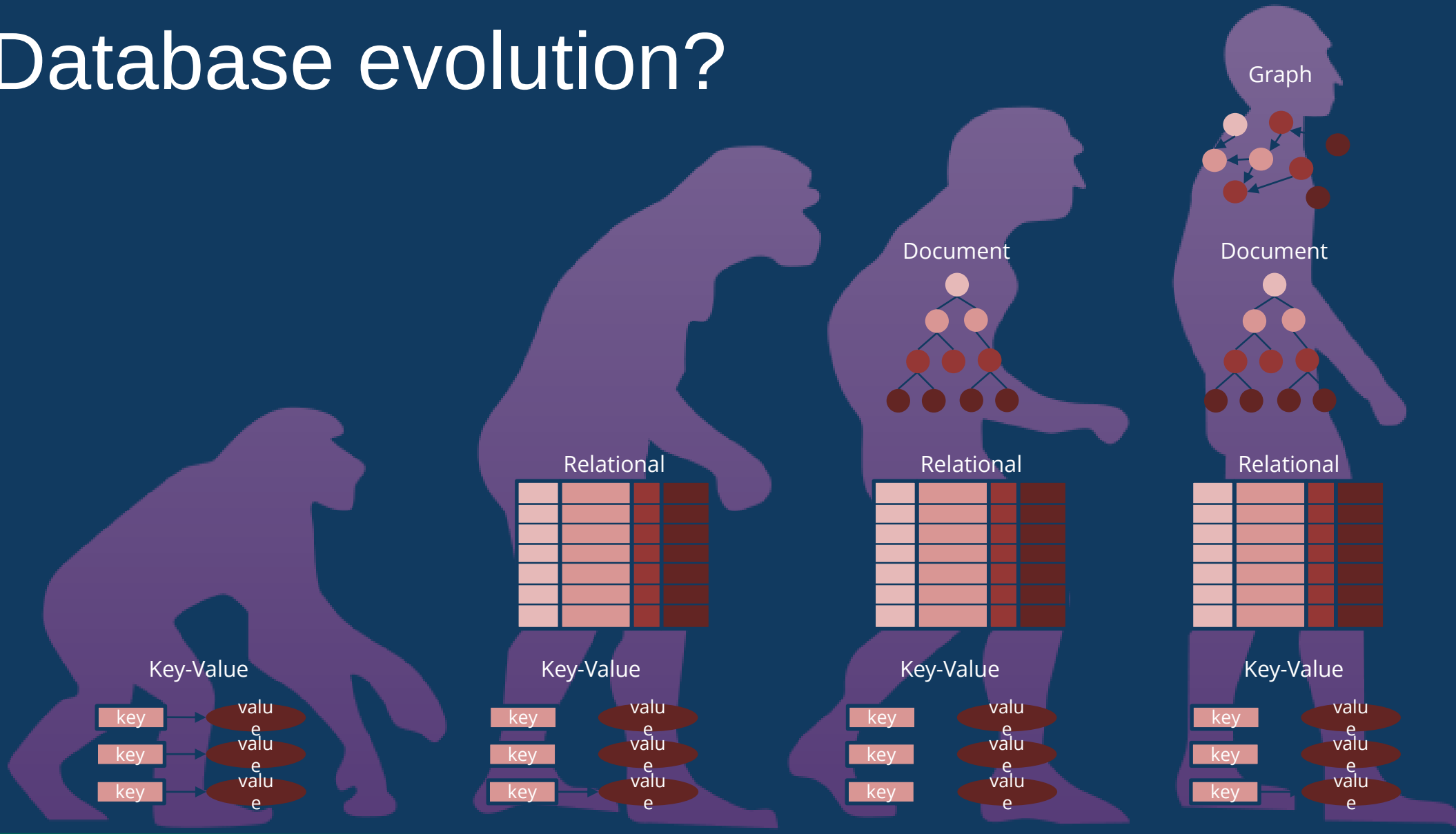
Key-Value

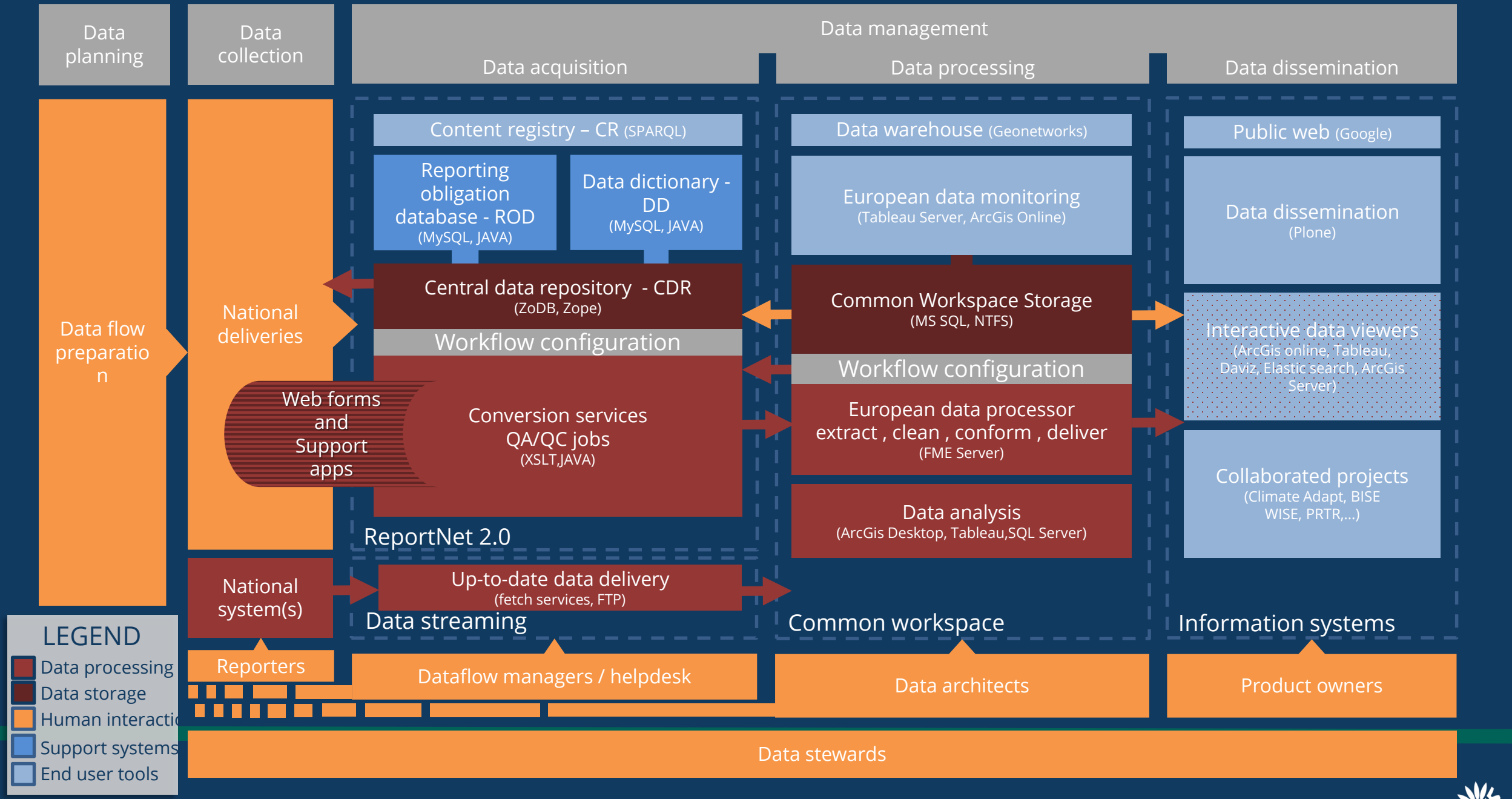


- Keys used to access opaque blobs of data
- Values can contain any type of data (images,video,files)

Pros: Scalable, simple API (put,get,delete)
Cons: No way to query based on the content of the value
Example: Azure Blob-storage

Database evolution?





European Environment Agency


QUESTIONS ?