Semantic technology helps computers understand data like humans understand language.

FEDeRATED Semantics

FEDeRATED semantic deliverables

1. **Developed Semantic Model**: Standardized data representation for transport and logistics.
2. **Alignment of Ontologies**: Integrated diverse data standards for interoperability.
3. **Implemented Semantic Web Technologies**: Utilized RDF and SPARQL for data linking.
4. **Digital Twins and Event Data**: Translated logistics operations into digital formats.
5. **Created Semantic Adapter**: Transformed data to align with the semantic model.
6. **Supported Linked Data Principles**: Enhanced data interpretability and actionability across systems.

Semantic interoperability

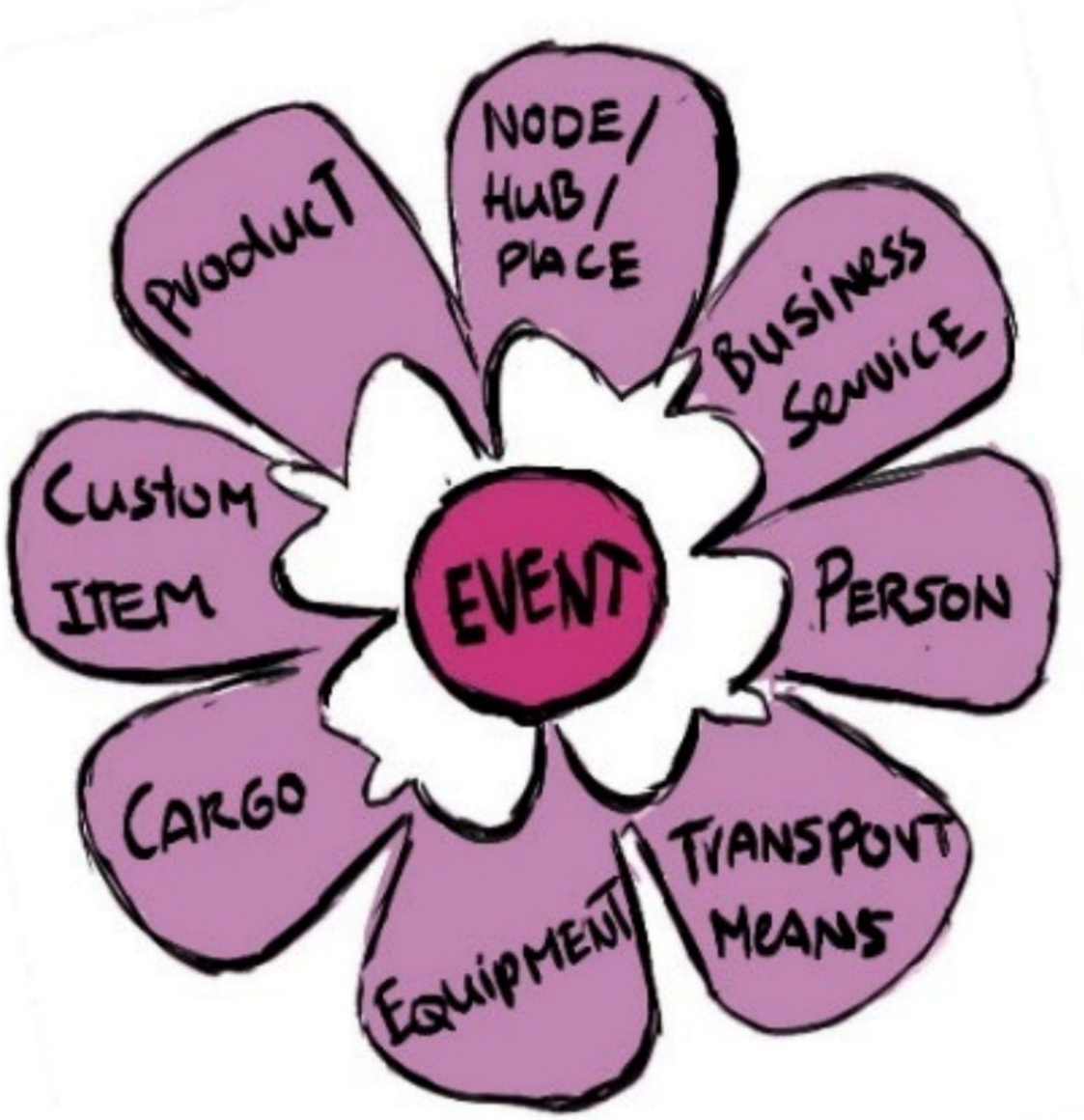
European Interoperability Framework

Semantic interoperability facilitates scalable, seamless data exchange across transport and logistics networks.

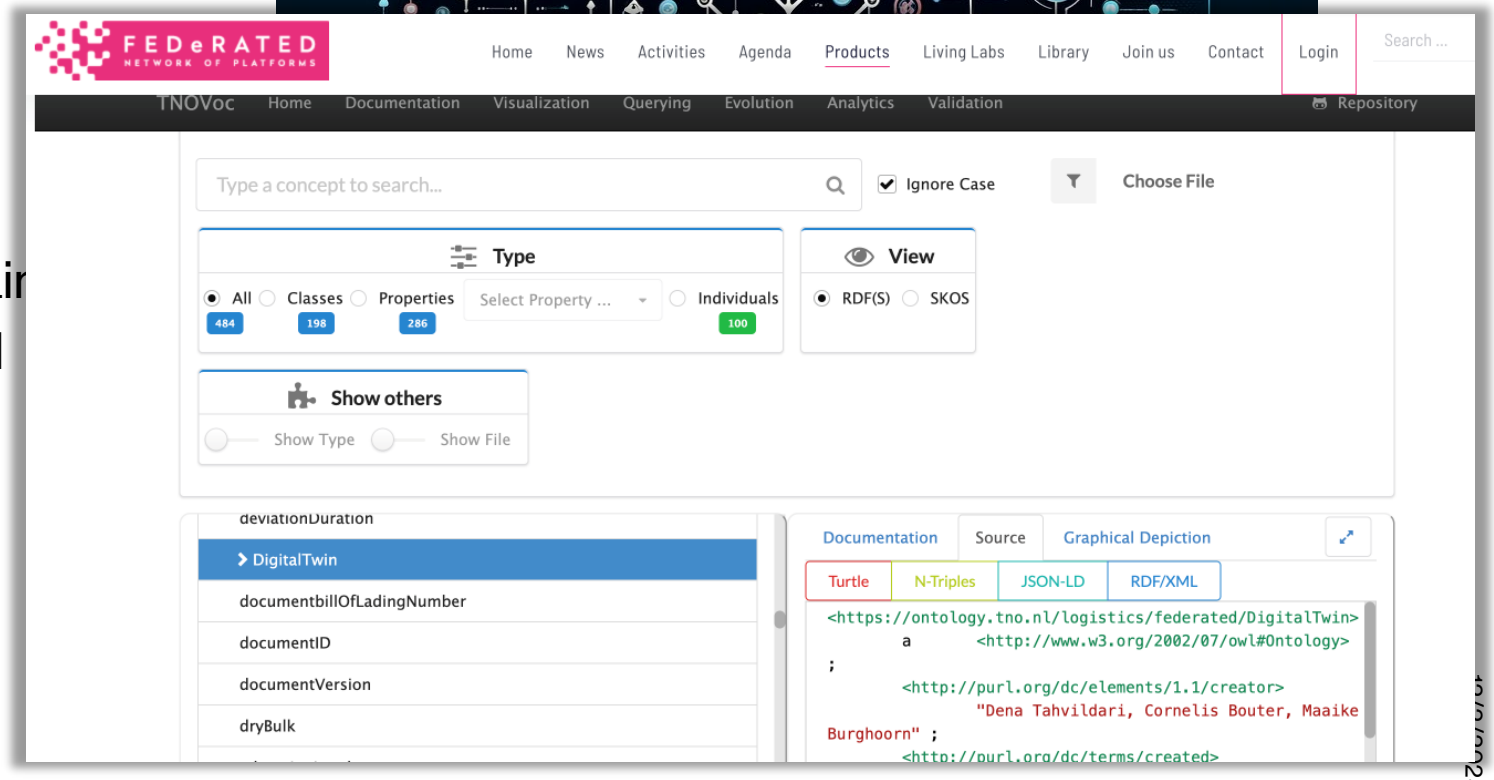
Digital twins and Events

Digital Twin is a taxonomy of real-world objects and infrastructure: *Product, Custom Item, Cargo, Equipment, Transport Means, Person, Business Service, Node/Hub/Place*

Event is the association between two or more Digital Twins in time and space.



Ontology, the language of semantics



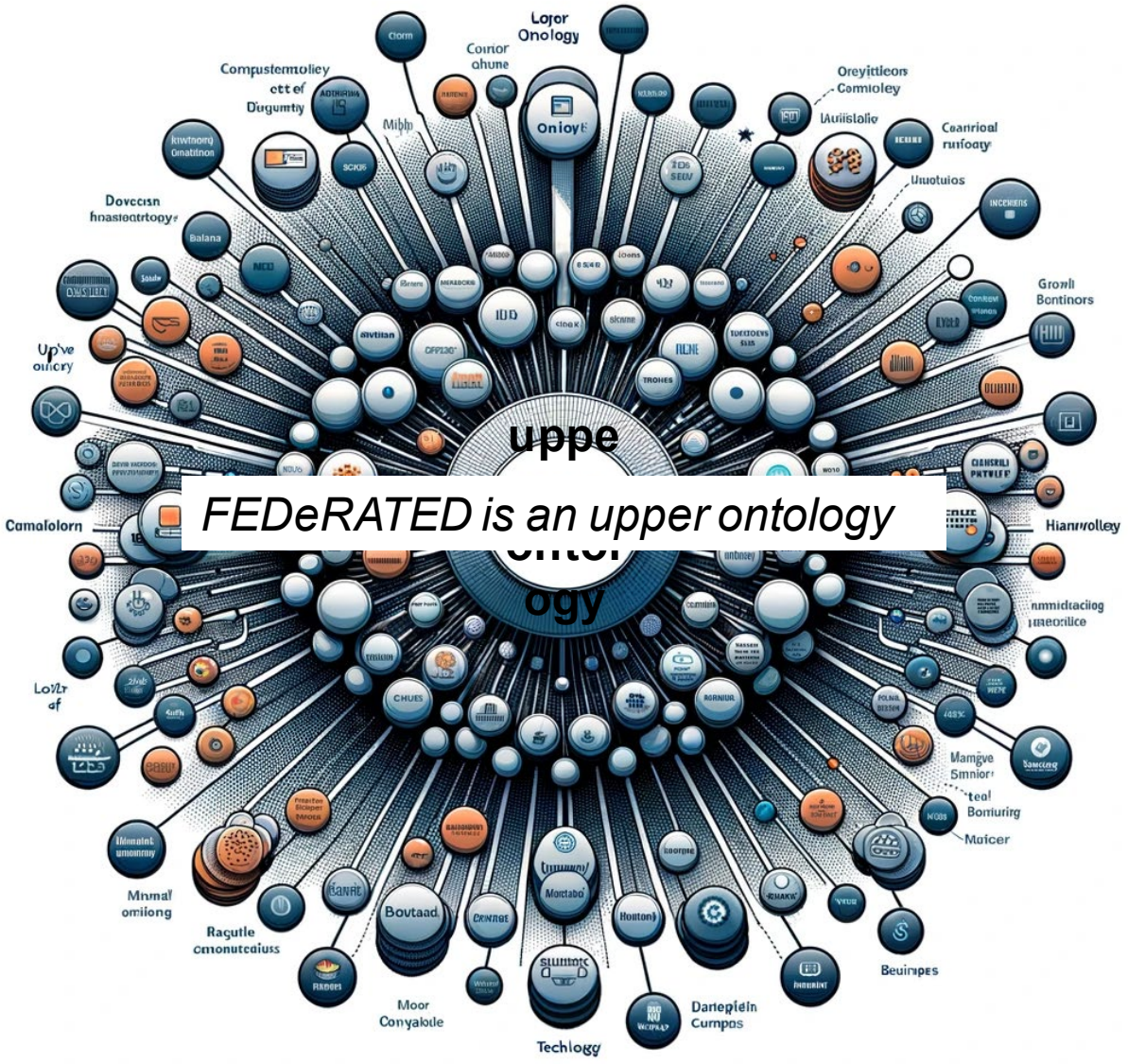
An ontology is a structured framework that defines and organizes concepts within a domain, enabling clear communication and data processing.

- Terms & Concepts
- Relationships
- Hierarchy
- Rules

Upper vs Lower ontology

Upper Ontologies: Abstract, general concepts universal across varied domains, including overal logistics domain

Lower Ontologies: Detailed, specific to branches of logistics, defining industry-relevant terms and relationships.



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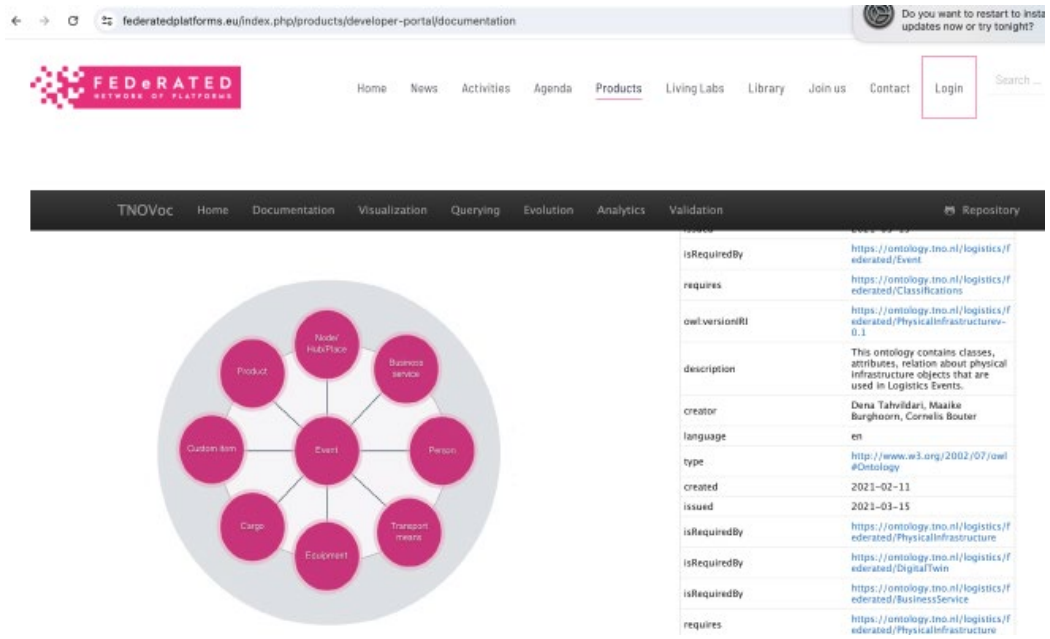
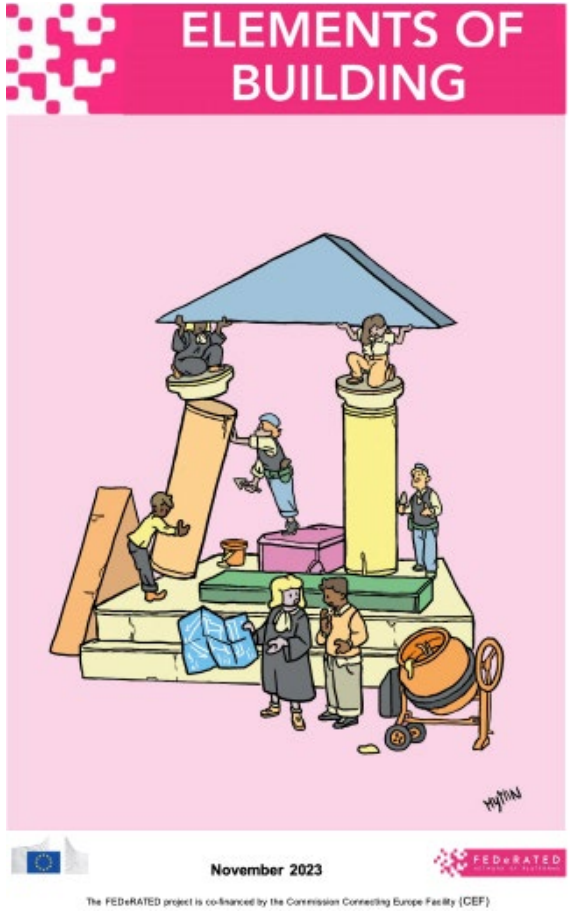


https://www.federatedplatforms.eu/index.php/products/developer-portal/documentation



https://www.federatedplatforms.eu/images/Library/Activity2/Elements_of_Building_final.pdf

The road ahead

Assess **digital maturity**; develop personalized transformation roadmaps.

Standardize data formats; establish common frameworks.

Ensure new solutions are **backward compatible.**

Adopt **incremental** digital integration steps.

Provide stakeholder **education** and training.

Use **collaborative platforms** for system connectivity.

Initiate **pilot projects** to showcase benefits.

Align with **regulatory compliance**; offer incentives.

Implement **scalable**, modular digital solutions.

Create **feedback loops** for continuous improvement.