CIRPASS
Digital Product Passport

The European Digital Product Passport – presentation of CIRPASS project

- Industry 4.0 event on the DPP

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What is CIRPASS?

- Funded by the European Commission under the **Digital Europe Programme**
- **Duration:** 18 months (from Oct 2022 to March 2024)
- **Coordination and Support Action (CSA)**

- Build a common understanding on a **cross-sectoral DPP system**.

- Be an objective source of information for the **European Commission**
- Be an objective source of information for **all DPP stakeholders**

  - By gathering as much information as possible from as many sources as possible.
  - By listening attentively to all.
  - By listing the pros and cons of all approaches.
  - By gathering feedback on our analyses.
  - By helping put together the “DPP puzzle”.

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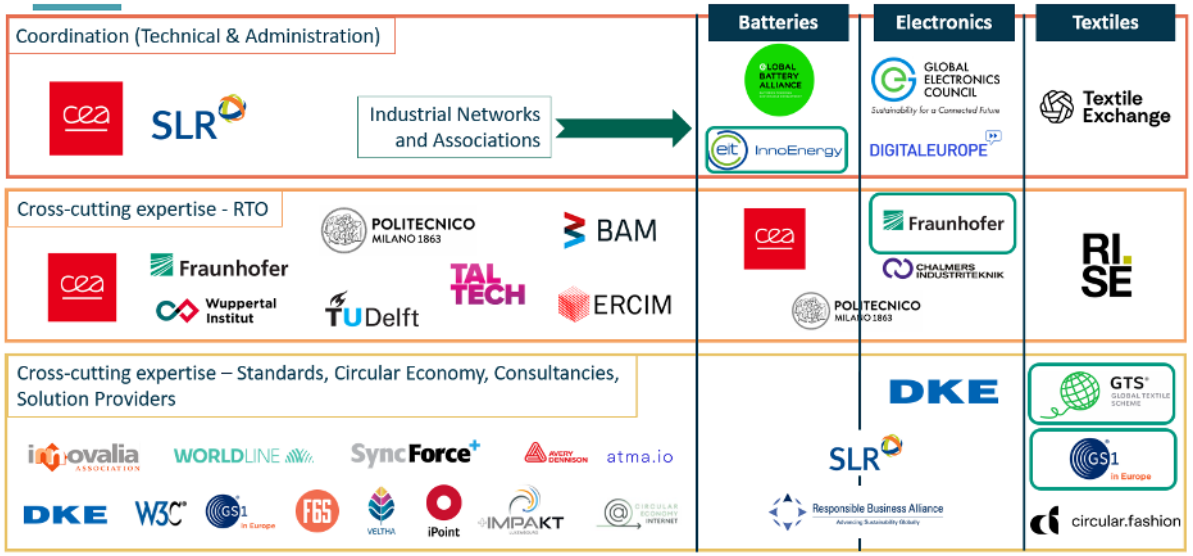
Building consensus on the architecture of a standards-based DPP system

Initial sector focus:

CIRPASS Consortium – 31 partners

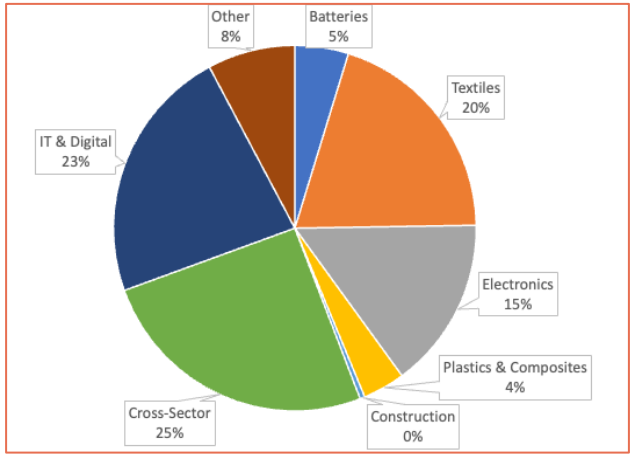


Partnerships

And many more…

Stakeholder Community Building

September 2023:
748 registered stakeholders, 1205 newsletter subscribers, >1300 website visitors/months



~15% with DPP-related initiatives/pilots

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CIRPASS Resources (some examples)

- Short “**Fact sheets**” on related regulations
- How to **get involved**?
- **Benchmark of existing DPP-related initiatives** & **Annex (V6)**

Project Results

Benchmark of existing DPP-oriented reference architectures

This document presents the outcomes of the benchmarking activity performed within WP3 of CIRPASS. The objective is to frame existing DPP-related initiatives and observe general macro-trends and existing gaps in view of the alignment with the ESPR Proposal goals. The deliverable is structured in three sections, focusing on (i) the presentation of the adopted classification methodology, (ii) the formalised presentation of a sub-set of existing DPP-related initiatives focusing on the IT architecture, (iii) the critical analysis of the entire set of mapped initiatives. Take-home messages and recommendations are summarised in the final section of D3.1 to be further considered within the future activities of CIRPASS.

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Annex to the "Benchmark of existing DPP-oriented reference architectures"

This document is a supplementary Annex to the CIRPASS report “Benchmark of existing DPP reference architectures”. This Annex provides summary profiles, organised according to a common template, of initiatives that are related to the Digital Product Passport (DPP). It thus provides the European Commission and the DPP stakeholder community with an overview of potentially relevant services and products.

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Extensive **FAQ**

CIRPASS

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FAQ

If you have a question that is not yet included in the FAQ section, please use the contact form to let us know and we will forward it to a CIRPASS expert.

We always look to further enrich this section by progressively including new questions and answers that might arise. By sending us your questions, you will be helping the entire DPP community! Thank you!

General

− How can I get involved?

- Follow us on social media: LinkedIn (https://www.linkedin.com/company/cirpass-dpp/) and Twitter (https://twitter.com/cirpass_dpp)
- Subscribe to our newsletter: www.cirpassproject.eu/#newsletter
- Email us: info@cirpassproject.eu

+ I have developed/in process of developing a DPP initiative, and I would like it to be included in the CIRPASS registry of DPP initiatives.
+ What is a Digital Product Passport (DPP)?
+ What is CIRPASS?
+ What does CIRPASS stand for?
+ What are the objectives of CIRPASS?
+ An objective of this project is to make 3 DPP prototypes. What is a DPP prototype in the context of this project?
+ What EU legislation is this project based on?
+ What is the timeline of the project?
+ What DG's of the European Commission are steering this project?
+ Will DPPs be mandatory?

− Will companies that are not part of the CIRPASS consortium be allowed to develop and market their solutions for the DPP?

(Recently added question/answer)

- A huge number of companies are developing DPP “pilots” and solutions. We list a large number of DPP-related initiatives in the public report we have published on our website, and we hope to increase this list in the coming months. All initiatives are warmly invited to add their contribution to this report.

CIRPASS is not a standardization body. We are working to help the Commission understand the missing standardization activities that will be necessary to enable the DPP system. In parallel, as our understanding about the future DPP and DPP system improves and evolves, we try to communicate this to the wider community so that we all globally share the same level of understanding of what the DPP is, and what it is not. Our aim is that the companies that are within the CIRPASS consortium have the same level of understanding and preparation for the upcoming DPP as all other companies outside. We study currently ongoing pilots to learn from them and help the Commission understand if it is going in the right direction.

+ The European Commission recently launched a public consultation/feedback for which product categories to prioritise in the first DPPs. Will the results of the public consultation/feedback affect the objectives and outcomes of CIRPASS ?
+ Is the target of the DPP consumers?
+ When are DPPs expected to appear on the market?
+ Will the DPP aim to monitor emissions?
+ What initiatives will be included?
+ How do you plan to connect existing initiatives?
+ How is the CIRPASS project different from other similar initiatives that are currently underway eg. French AGEC law decree 2022-748 and the product circularity datasheet initiative from Luxembourg?
+ Is it expected that manufacturers will resist the DPP?
+ There are no manufacturers in the Consortium - why? and will it be an issue?
+ What is important in terms of systems, technology and partnerships for advanced resource circulation across sectors, considering the difficulty in achieving cross-sectoral/cross-regional resource circulation due to laws/regulations barriers? What will be the steps for implementation?
+ What role does CEA play in CIRPASS, Catena-X and Gaia-X? Also, what will be the role of CEA after CIRPASS' DPP is implemented in society?

SME Related Questions

− When will guidance for SMEs be available?

- Guidance on the DPP will depend on the outcome of the discussions on ESPR.

+ How will we ensure that the DPP will be practical and affordable for SMEs?
+ If a repair event must be traced and saved in a DPP, how will this affect the repair shop which is often an SME?

DPP System & DPP Data

− Is the ESO/ISO required to make standards for the DPP?

- The ESOs will work on developing standards for the DPP, and it is expected to become international in the coming years.

+ Work in progress on draft of ISO/WD 59040.2 Circular Economy – Product Circularity Data Sheet. Will the DPP use make use of this standard?
+ What is the difference between a DPP system and DPP data?
+ What will the product disclosures look like? Will it include e.g. environmental impact, social, labour conditions in the supply chain, repair & refurbish manuals etc.
+ Will the granularity be model, batch or item?
+ Will the DPP be a QR Code?
+ Will the DPP be based on Blockchain?
+ How will one know how to properly recycle a product if during its lifetime subcomponents have been repeatedly swapped out for other second-hand components that were part of higher-level DPPs?
+ When are DPPs updated with new information?
+ Will CIRPASS data integration use blockchain? If not, what kind of technology will be used to realize distributed data integration that requires high degree of confidentiality?
+ Does the DPP incorporate a mechanism to protect data sovereignty of companies that link data? I.e. will connector technology like Eclipse Dataspace Connector by IDS and etc. be introduced with each company's system?
+ Technologies such as data management, reliability assurance, privacy protection are known to protect data while promoting data integration, what other technologies are required for DPP and Catena-X?

DPP Governance

− What about patents and license fees? Will we have to pay for standards? Will there be a once off payment or an annual fee?

- The goal is to have a non-proprietary solution

+ What support will be available for businesses and manufacturers to implement the DPP?
+ Is the DPP delegated act already in preparation?
+ Will the EU provide services for hosting and maintaining an open, central registry of DPPs?
+ How does CIRPASS plan to address the challenge of checking the accuracy of the information included in the DPP?
+ How will the EU ensure that it will not become a barrier to trade?
+ How will this affect actors from outside the EU?
+ Who will be responsible for providing DPP data for products being imported into the EU?

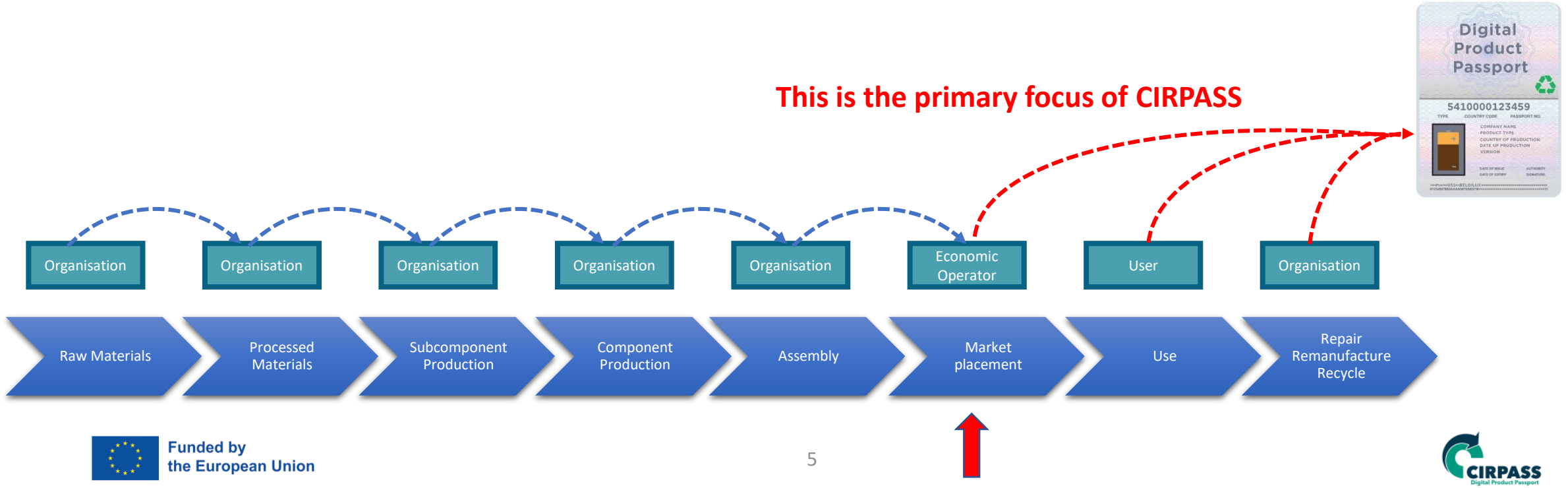
− Will access to some data be restricted?

- Access to data will be on a need-to-know basis. It is expected that certain actors will have access to specific subsets of data.

+ Who ensures that it points to a persistent, traceable information/data source?
+ Who will be operating and managing the systems for hosting the passports and hence who bears the costs towards that?
+ Can the DPP be a vehicle to fulfil the compliance to multiple EU regulations? An example: ESG data is requested in the Sustainable Due Diligence Regulation, in the Supply Chain Act, in the upcoming Critical Raw Materials Act, etc.?
+ Why are more actors from outside Europe, in particular Asia, not participating in this project?
+ Is it possible for company that provides data to determine the standards for disclosure and non-disclosure of data, and 3rd party access rights to data? Are disclosure standards standardised between various data integration platforms?

CIRPASS: What problem are we trying to solve?

- Problem #1:
- *"How can **all industrial sectors** agree on a common DPP system that is **compliant** to the requirements of future regulations and that is capable of supporting the massive issuing of DPPs as of 2027 (Battery Regulation requirement) ?"*



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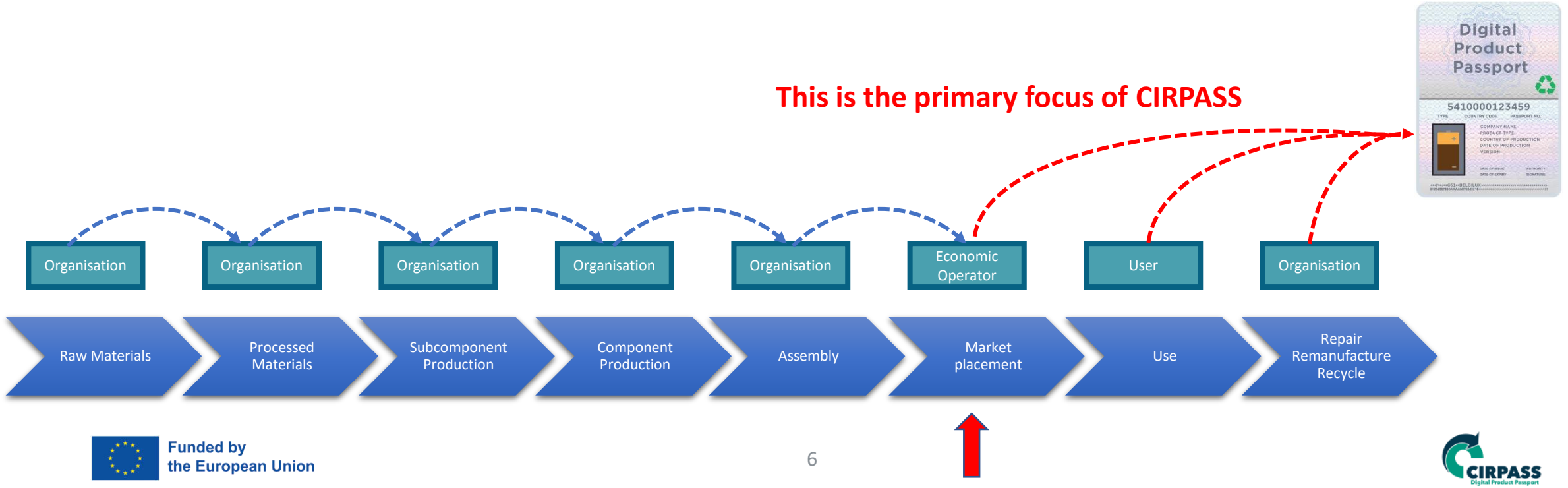
CIRPASS: What problem are we trying to solve?

- Problem #2:
- *"How can **all industrial sectors** agree on an **extensible and flexible** DPP system capable of supporting **beyond-mandatory** data exchanges to enable new circular business models and incentives?"*



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Requirements for the DPP system

The DPP is an information system for the Circular Economy.

Policy requirements

- No proprietary solutions
- Open standards and interoperable formats
- Decentralized data storage
- Both **static** and **dynamic** data
- **Public** and **private** access data

Business requirements

- Acceptability: Maximum reuse of legacy systems and legacy data
- Accommodate both **regulatory** and **non-mandatory** (business-model-specific) evolving information requirements.
- Future-proof and easy to deploy: A DPP system with built-in flexibility based on state-of-the-art technologies but sufficiently mature ecosystems to support DPPs in 2027

➡ The **Semantic Web** stack already comes with most of the necessary (and mature) access control, usage control, verification, data ingestion, data manipulation, data exploitation tools **to link data and meta data**.

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➡ Facilitates reuse of domain (expert) ontologies.

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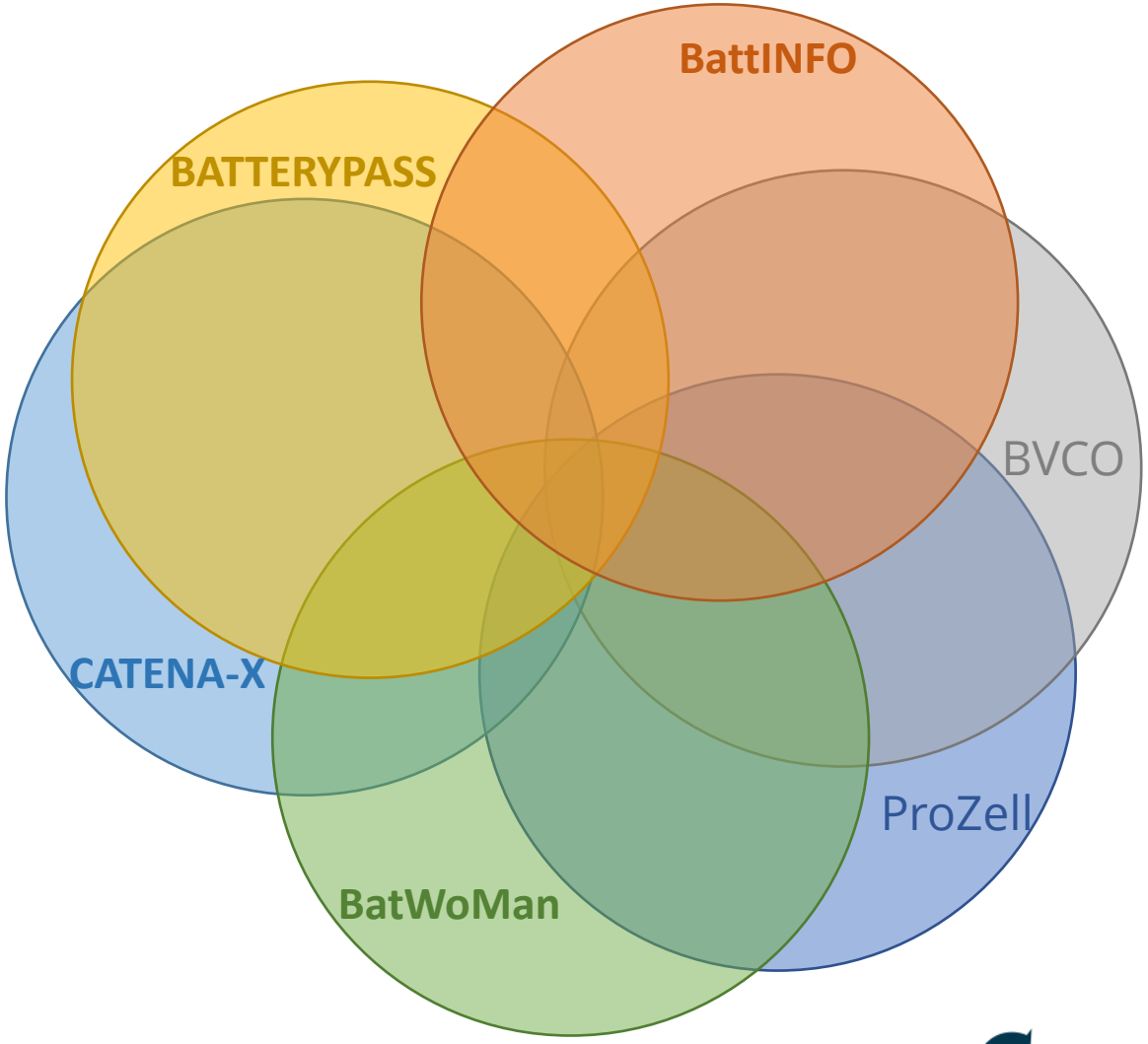
Domain (expert) ontologies

- A few examples of battery ontologies (among others):

- Domain ontologies are always designed for specific use cases.
- All can be **extended** to include mandatory data requirements.
- It is not difficult to express them in the Semantic Web formalism.
- Ontologies from different sectors can be **aligned**, enabling cross-sectoral interoperability.



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Ontologies + Data = Knowledge Graphs

- Ontologies define the **types** of things that exist in the domain and the **properties** that can be used to describe them. Ontologies are *generalized* data models.
  - An ontology contains:
    - **Classes:** the distinct types of things that exist in our data.
    - **Relationships:** properties that connect two classes.
    - **Attributes:** properties that describe an individual class.

  - Ontologies are designed by experts.

- a **knowledge graph** uses an ontology as a framework to describe specific products.

- CIRPASS proposal : A DPP is a knowledge graph (at least conceptually).

- Please see my short talk on knowledge graphs:
  - www.cirpass.eu → Training videos

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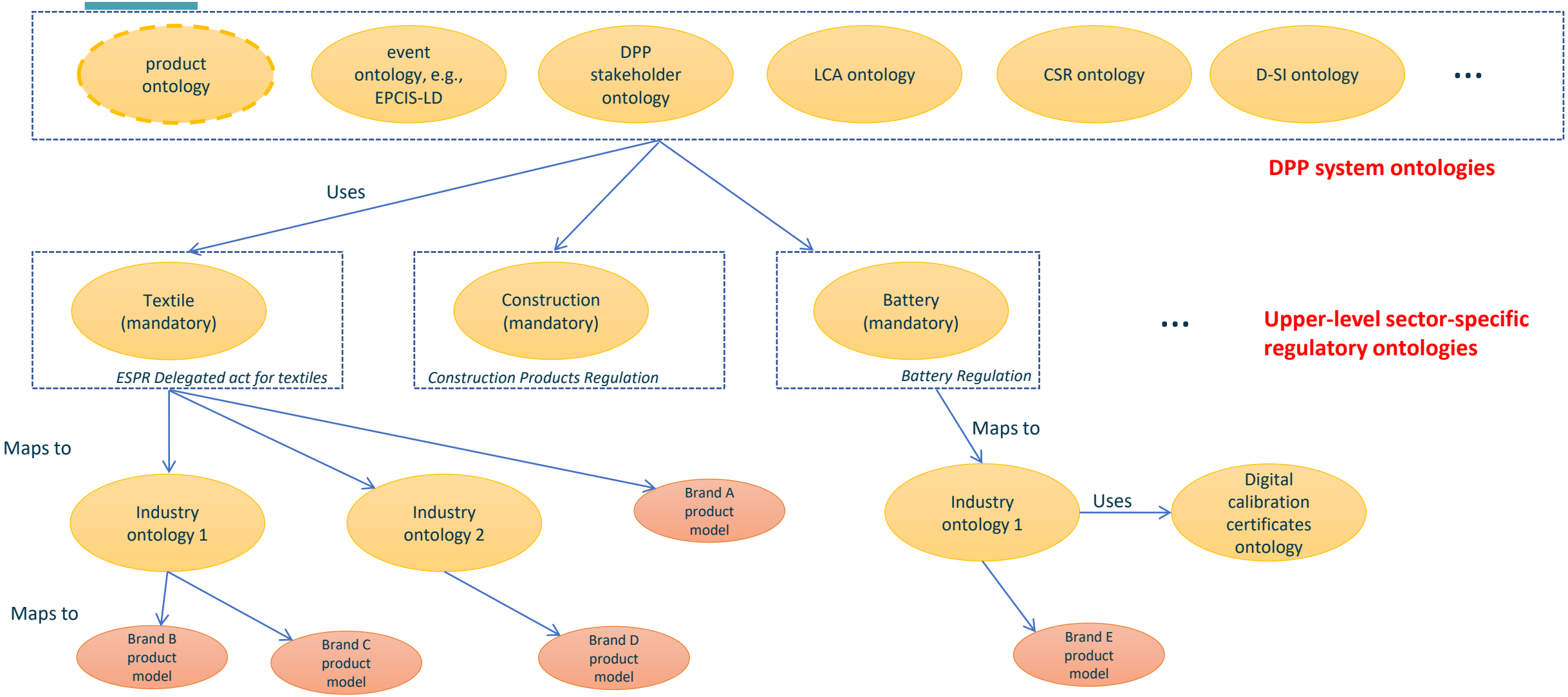
DPP system ontologies – conceptual world view



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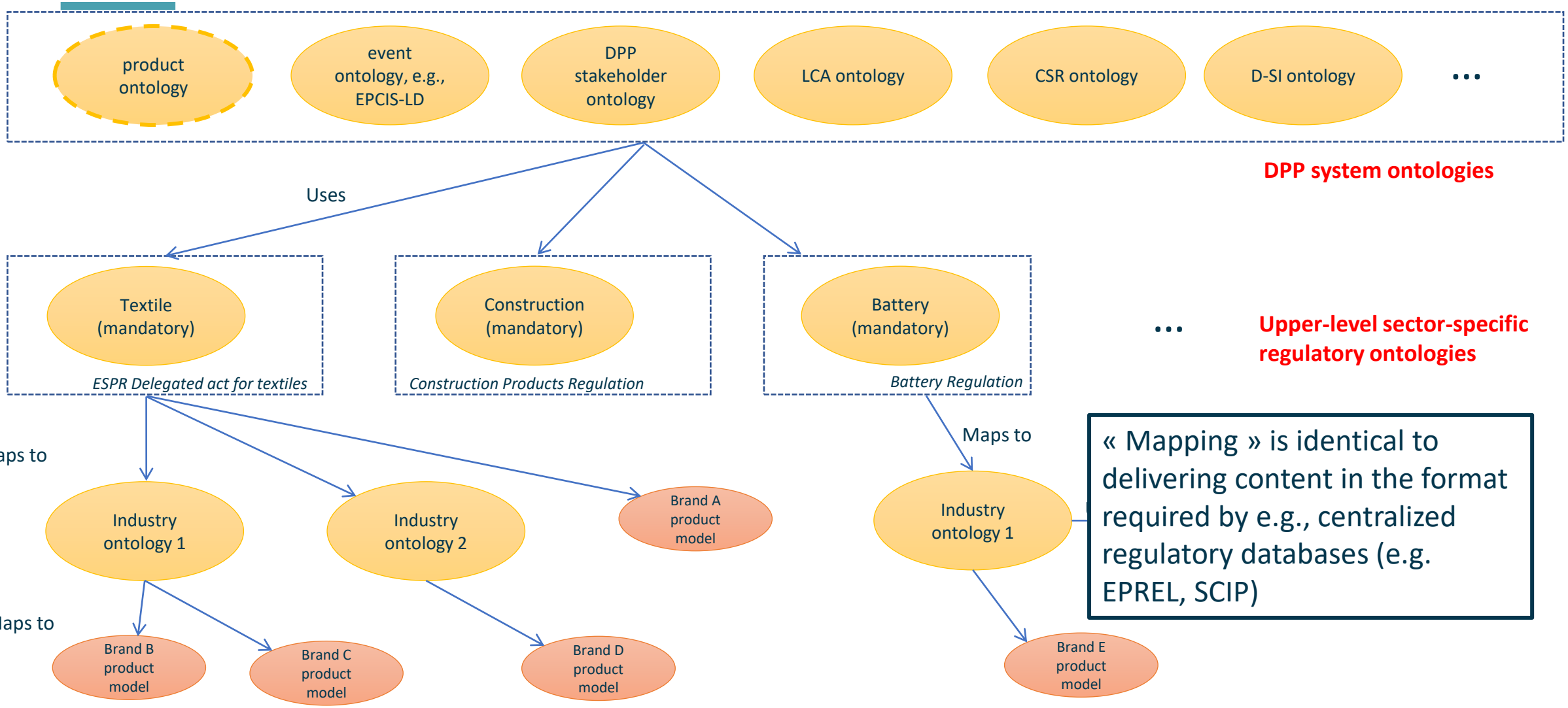
DPP system ontologies – conceptual world view



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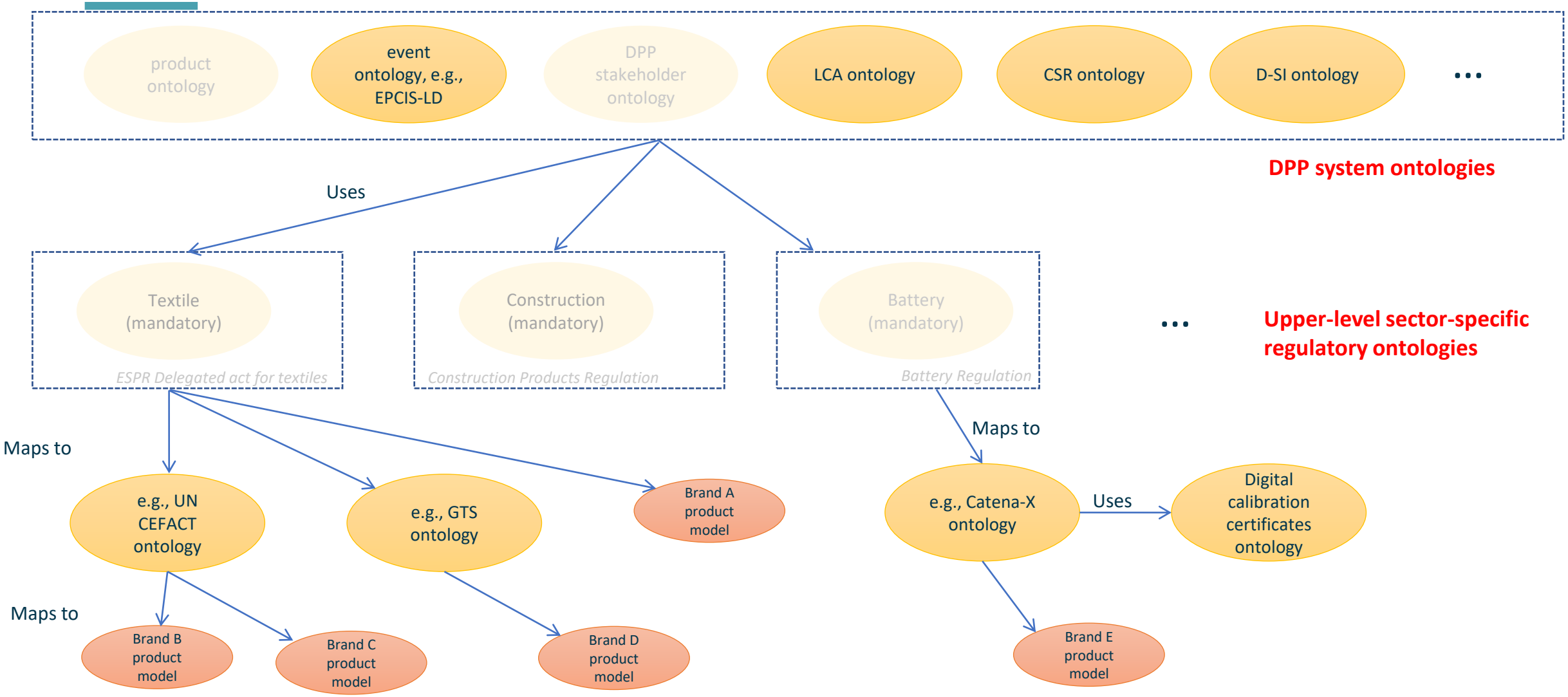

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DPP System : A Federated Network of platforms

Data connectors are used to connect to **legacy company IT systems**
- they *expose* data and accompanying meta data (semantics)
- data access and usage rights are linked to the data

Manufacturing company **A**, using legacy IT system **A**

AAS
Company **B**, using IT system **B**

DPP-as-a-Service operator, using legacy IT system **C**

Traceability platform e.g., using DLTs

A/RDF | Rights

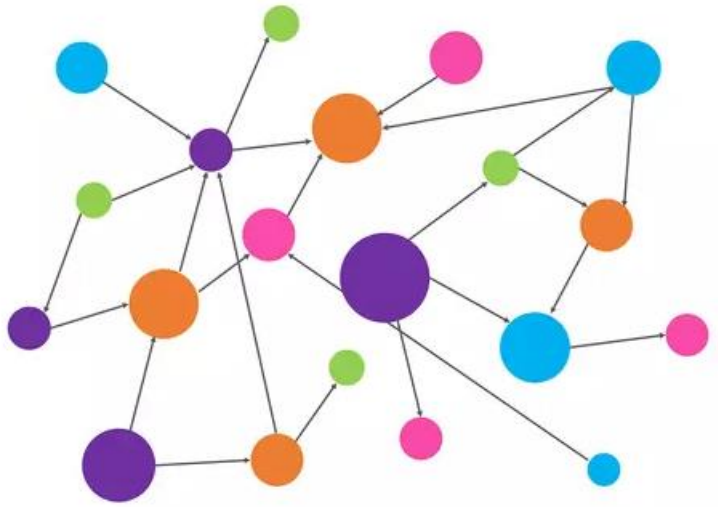
B/RDF | Rights

C/RDF | Rights

D/RDF | Rights

RDF

DPP DATASPACE / DATAFABRIC



RDF/**E** | Access control → Remanufacturing company **E** importing data into legacy IT system **E**

API (filter) | Access control → Repair company E reading/writing useful data

API (filter) | Access control → Webpage or App for consumers

Query | Access control → Statistics & Aggregation tools for market surveillance

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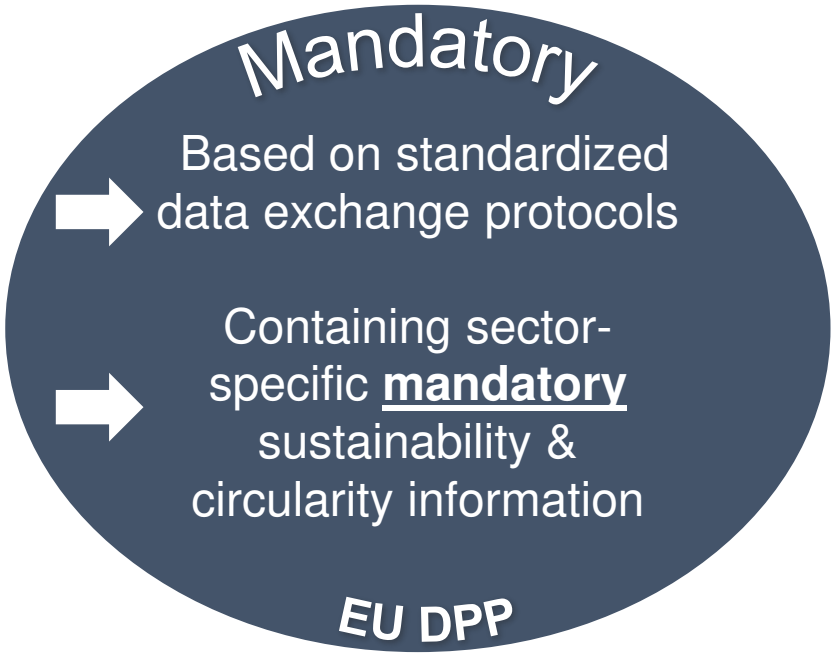
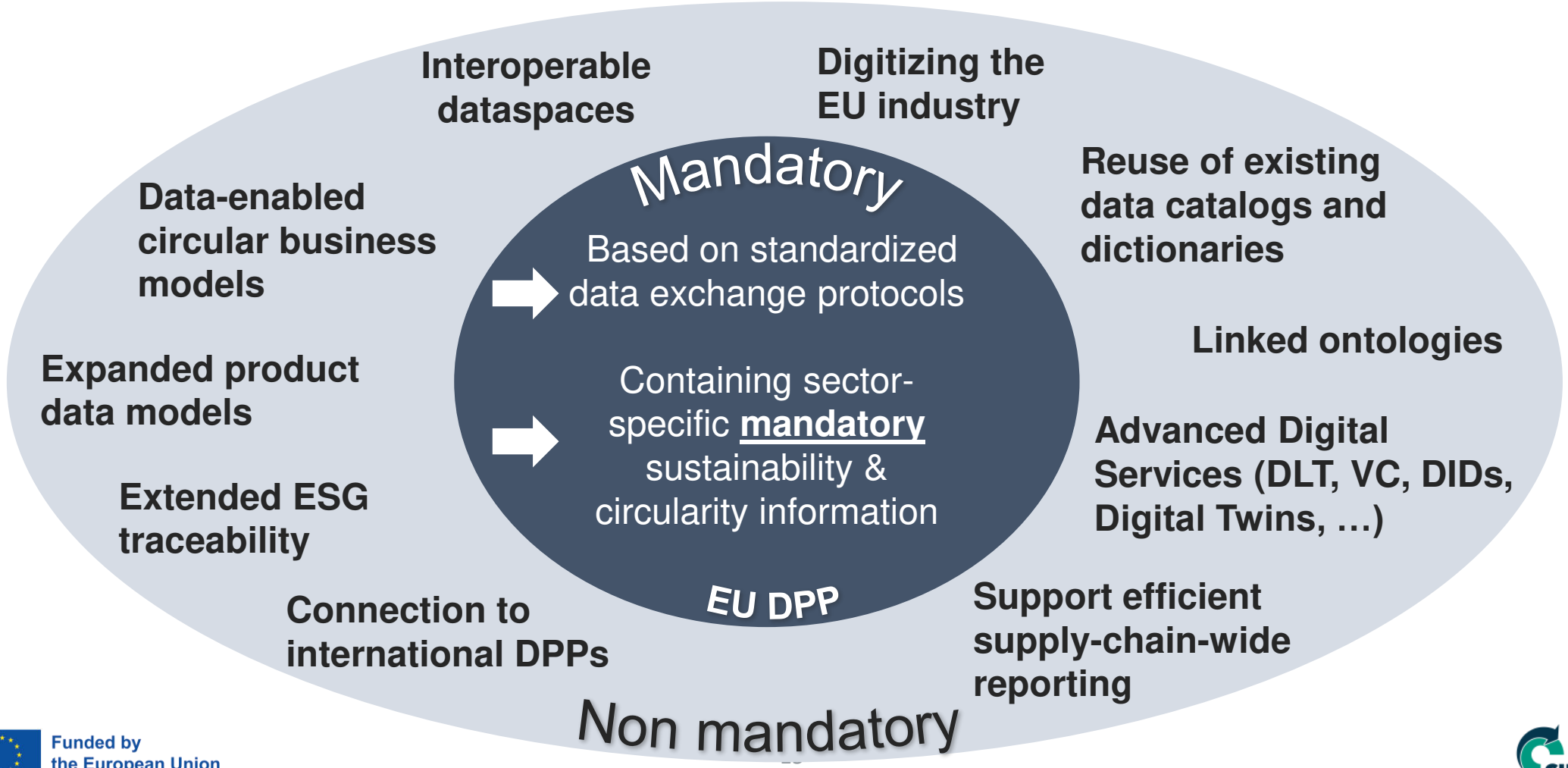
Why is the DPP System an incredible opportunity?



Why is the DPP System an incredible opportunity?

Vision: The DPP links the EU internal market to the data economy.



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Lots of ongoing work @ CIRPASS

- Requirements for the DPP system (DPP system user stories)
- Study of information gathering effort versus usefulness
- DPP adoption: barriers and opportunities
- Report on identification schemes
- Report on current standards landscape
- Cost estimation of DPP-as-a-Service.
- Study on the use of blockchain technologies for the DPP, led by CEA
- Study on the transaction environmental cost of the DPP versus potential benefits, led by FHG IZMA
- Demo videos
- Etc.

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Thank you!

www.cirpass.eu

Contact us: info@cirpassproject.eu

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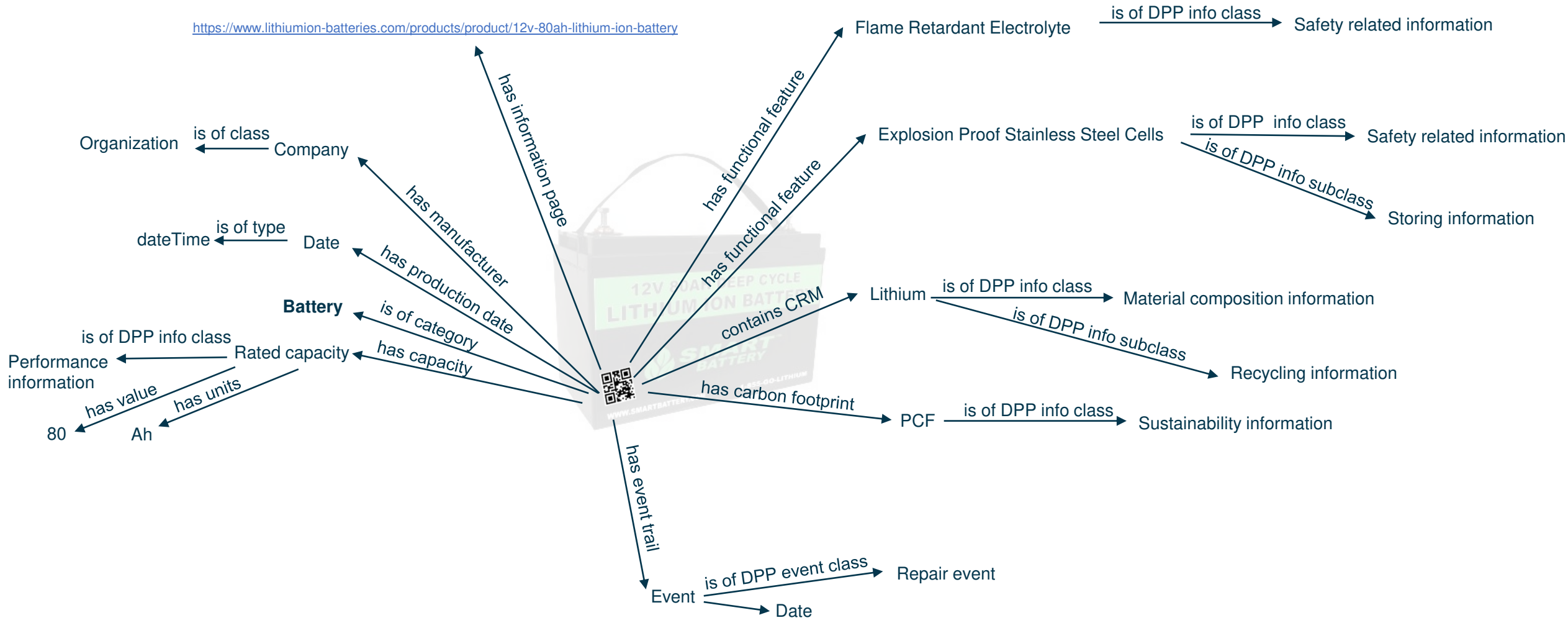
E.g. DPP knowledge graph for a battery



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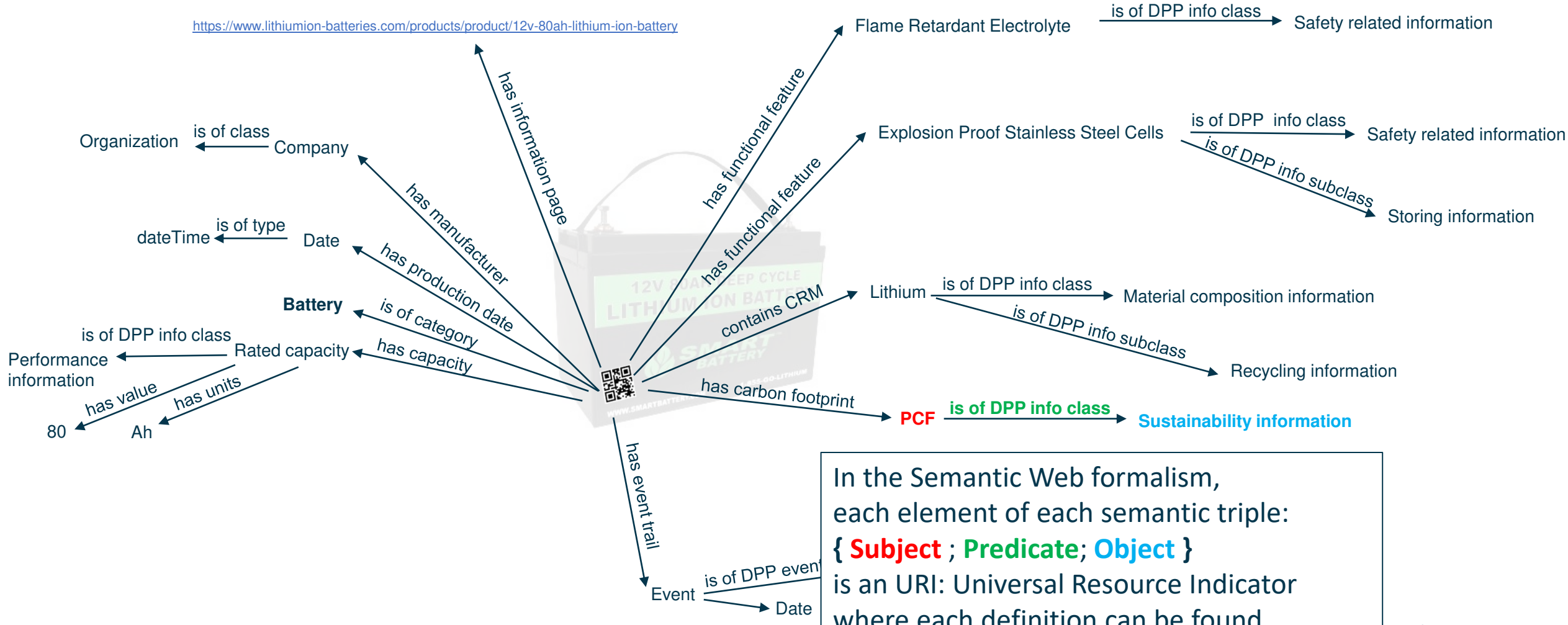

In the Semantic Web formalism,
each element of each semantic triple:
{ Subject ; Predicate; Object }
is an URI: Universal Resource Indicator
where each definition can be found.

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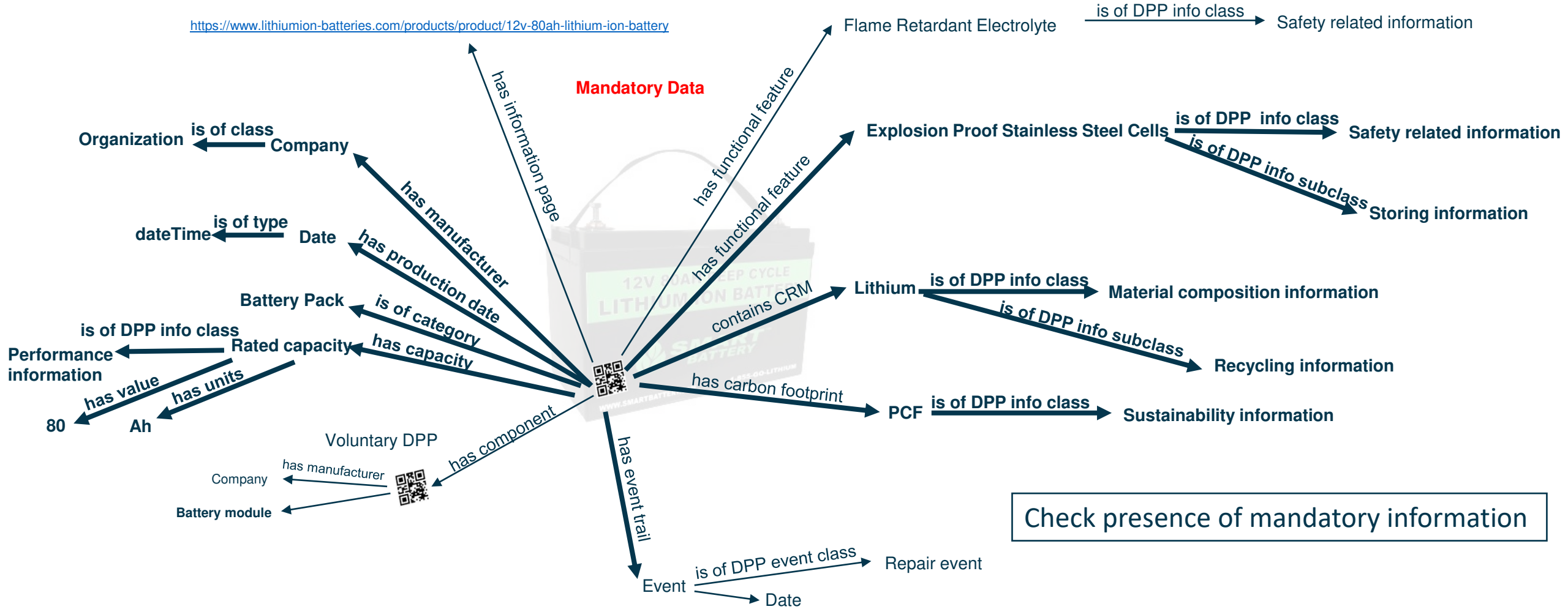
Verifying DPP compliance

e.g. using the SHACL (Shapes Constraint Language)



Check presence of mandatory information

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