DPP Architecture

A CIRPASS Suggestion

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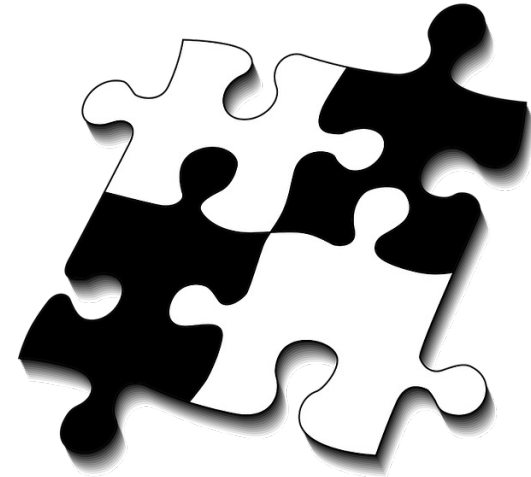
Dr. Panagiotis Papadako, ERCIM/FORTH Researcher (Panagiotis.Papadako@ercim.eu)
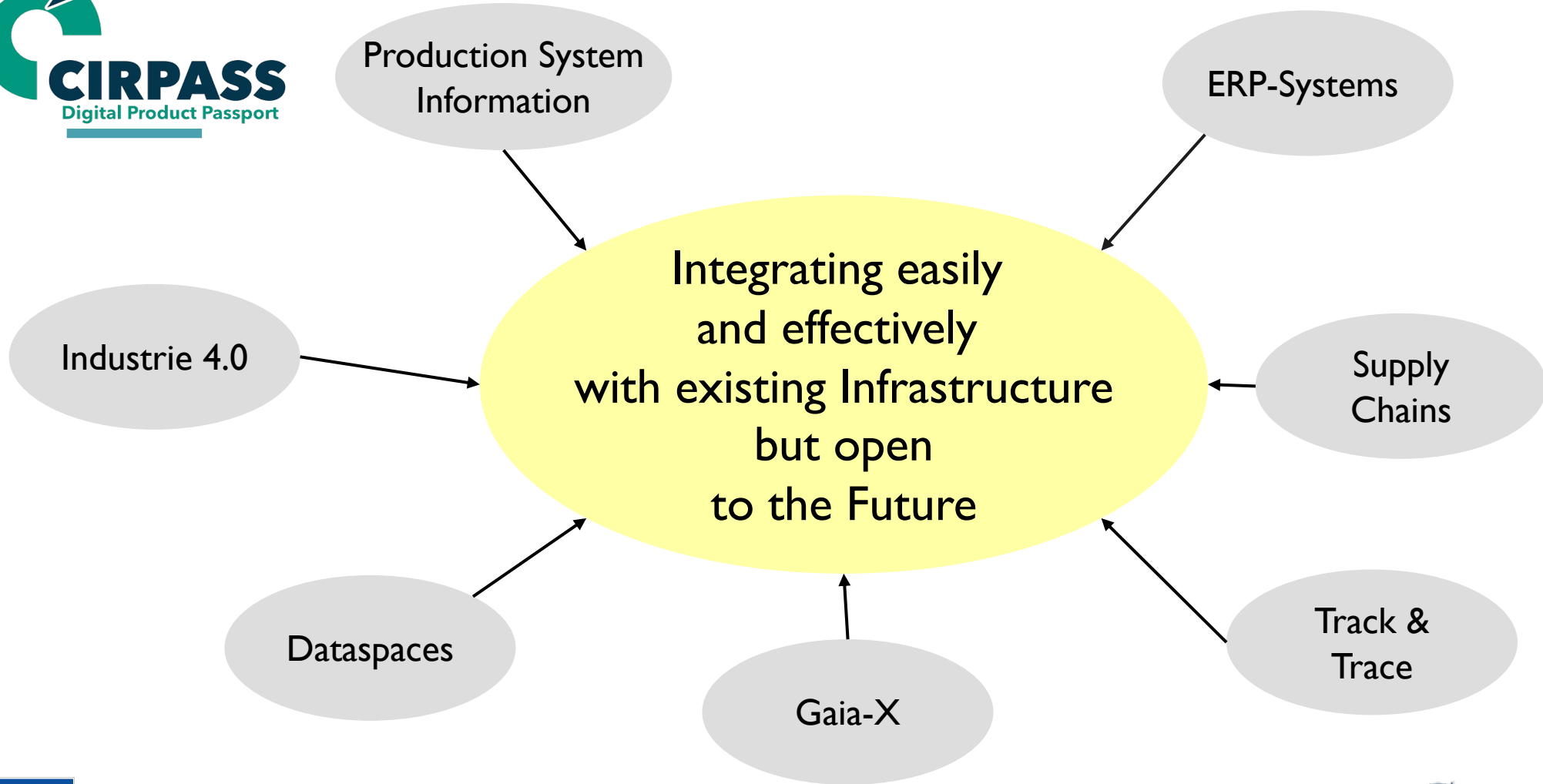
https://www.ercim.eu/

Design goals

- Interoperability

- Flexibility

- Combinability

- Extensibility

- Standardised level playing field

- Product-centric
- Decentralized in all kinds of ways

Integrating easily and effectively with existing Infrastructure but open to the Future

- Production System Information
- ERP-Systems
- Industrie 4.0
- Supply Chains
- Dataspaces
- Gaia-X
- Track & Trace

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Digital Product Passport

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Easy to create

- Produce DPP from existing information workflows

- Combine information from a variety of sources

- Easy registration/ automated red tape API
  - API for information exchange with authorities
  - Validation tools from authorities

- **Control**
  - Access control, usage control, compliance automation

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Basic Features intended

- Public DPP information for consumers

  - Easy & reliable discoverability

  - Easy to display on any device (web)

- Flexibility

  - Deliver information based on needs (role based access for "recyclers" & "repairers")

  - Usability for authorities as data-centric system (from data to Product & not from Product to Data)
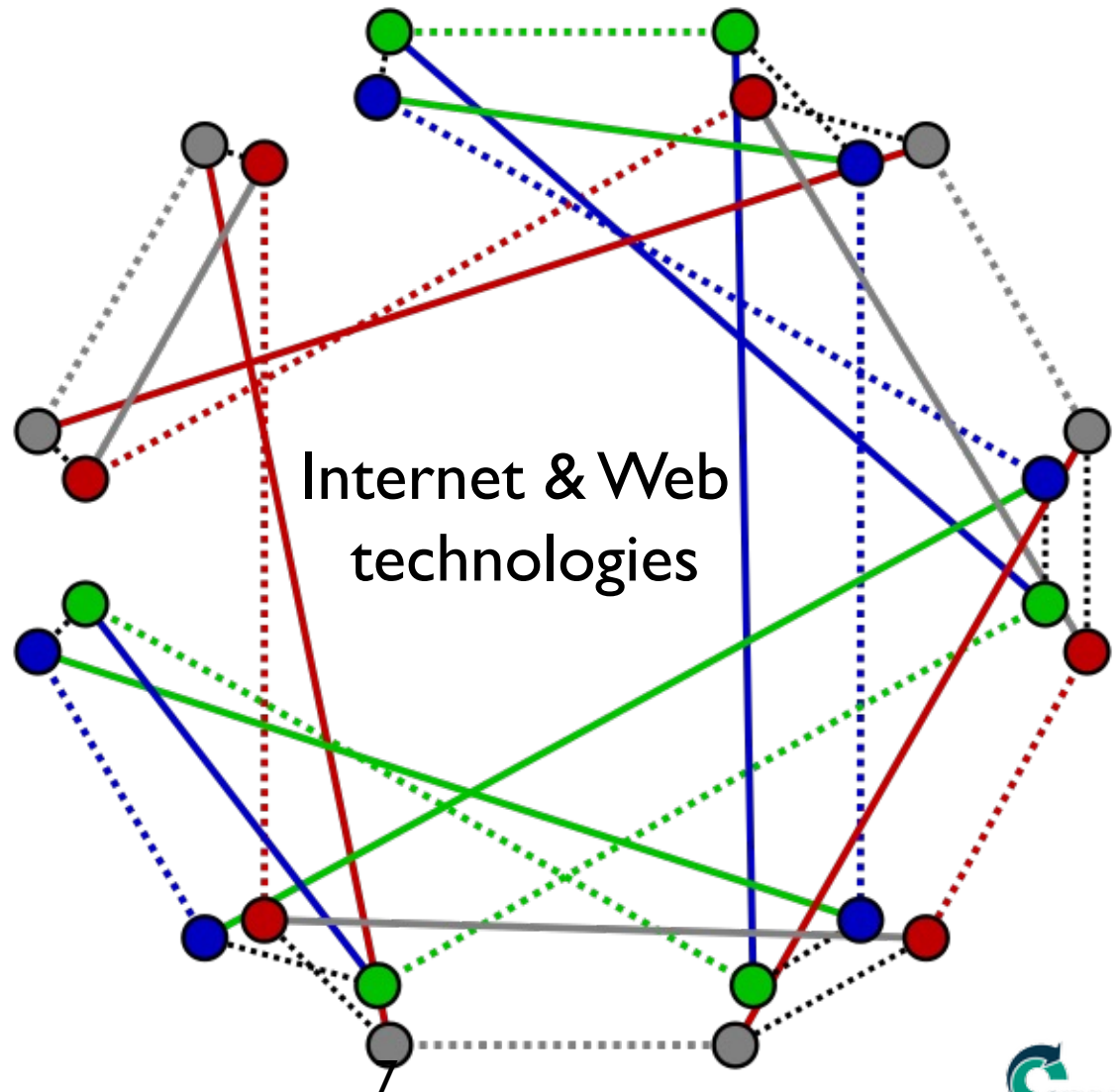
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Extensibility

- Integrates well into:
  - Dataspace concept
  - Gaia-X and data sovereignty
- Extend DPP data
  - To add non mandatory data easily
  - Ability to carry Industrie 4.0 data

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Decentralized & interoperable Basis for thousand flowers to bloom

Internet & Web technologies

How?

One system, two ways to access

Product UID	https://example.org/UID	did:method:UID
Finding the resolver	DNS or ISO 15459	DID method (e.g. EBSI, web method)
Finding the data	Resolver	DID Document
Accessing the data	**Decentralized Data Repository (or dataspace or maybe with Linked data API)**	

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Parallel interoperable designs

- HTTP Architecture
  - Short term vision
  - Availability of tools high
  - Decentralized
  - 5 roles

- DID Infrastructure
  - Longer term
  - Includes advanced features
  - 5 roles

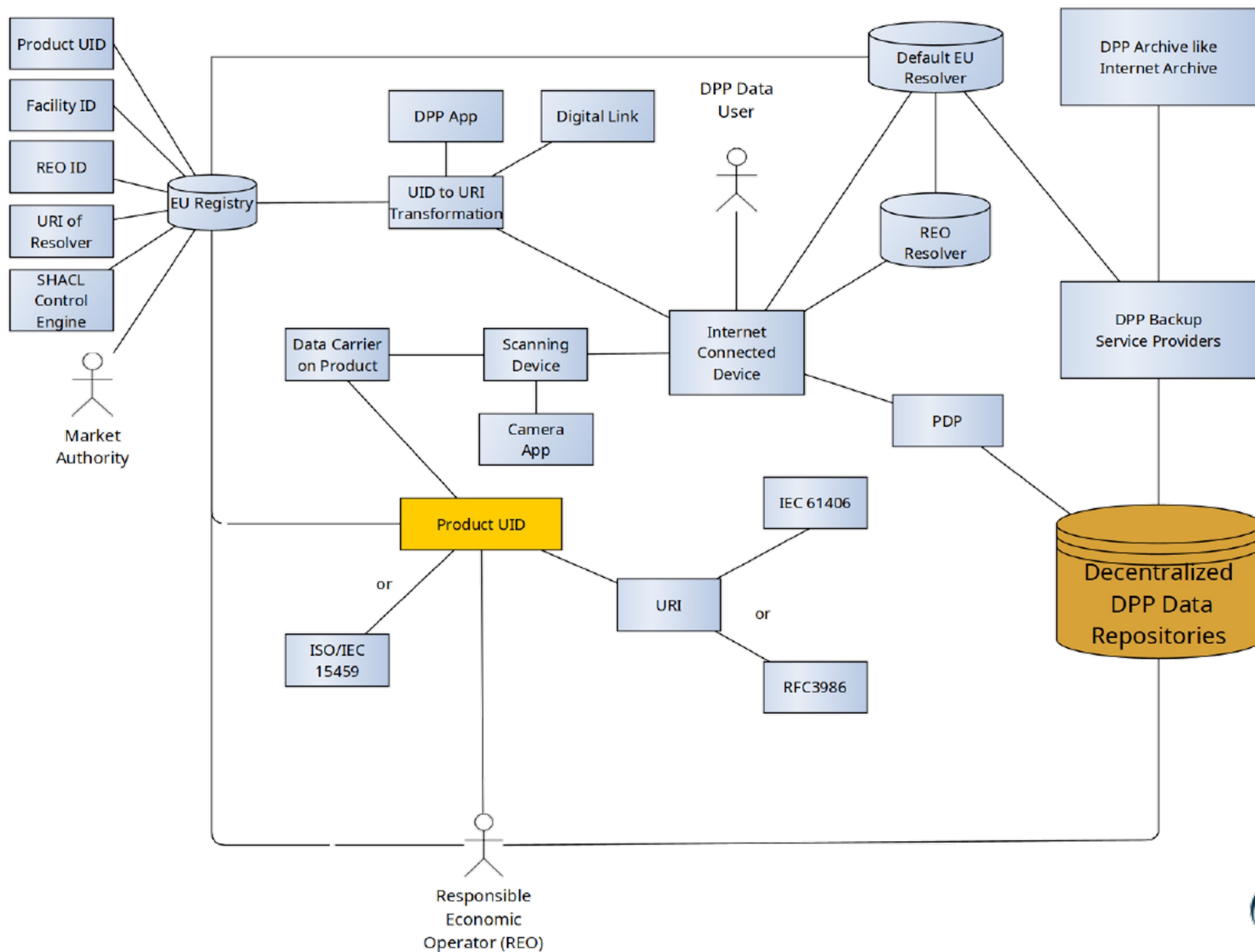*Different path to the same information: The DPP is the same*

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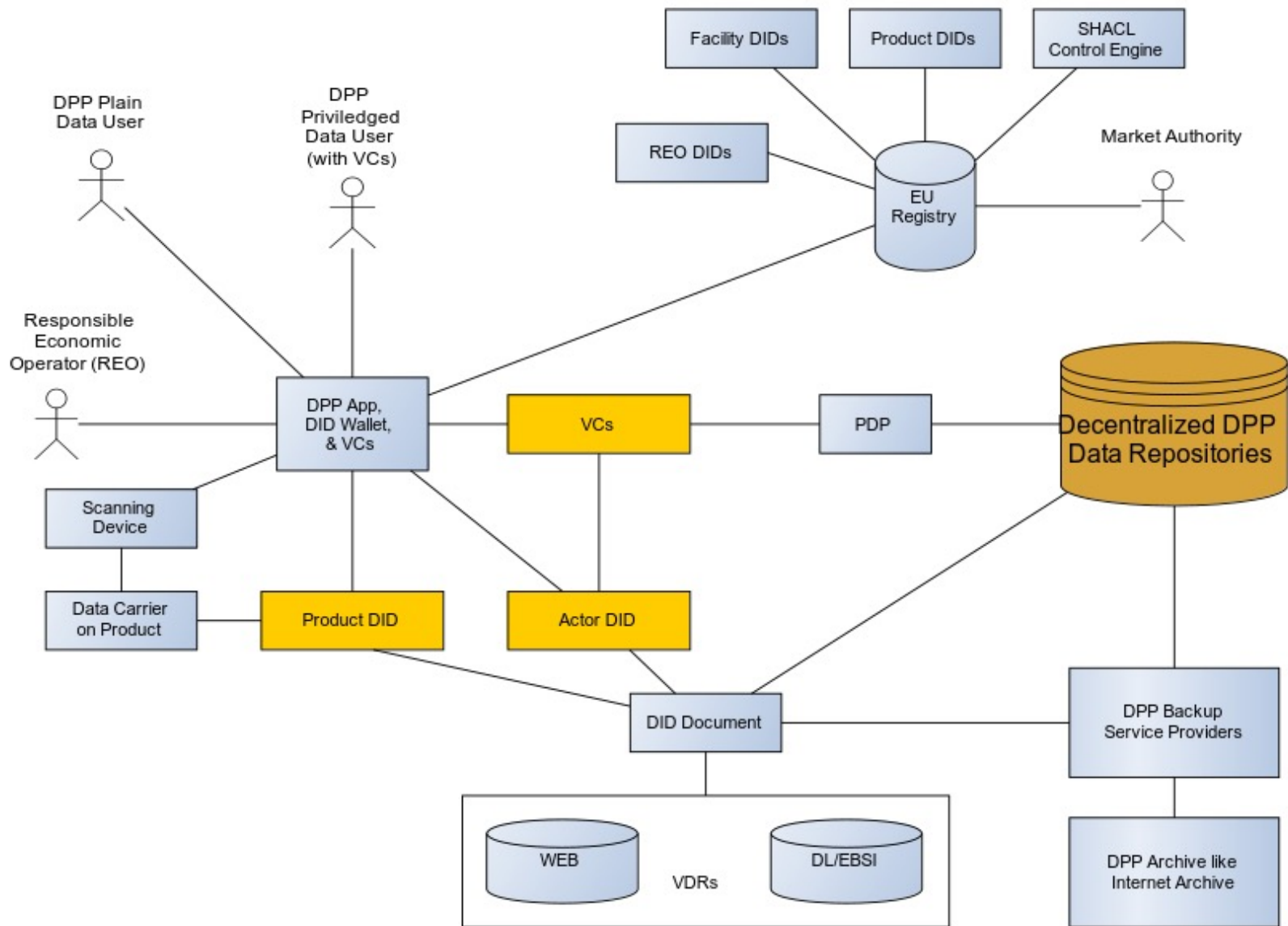# Common to both approaches

- Decentralized
  - DID is even more decentralized

- Product centric
  - Product UID scopes DPP

- Linked data as interoperability layer
  - Transforms to and from Linked data

- Decentralized Data Repository
  - One or more Repos
  - APIs standardised
  - 1000 ways to implement

- Tailored access role types:
  - "Consumer", "Recycler", "Repairer", "Remanufacturer", "Market Authority"
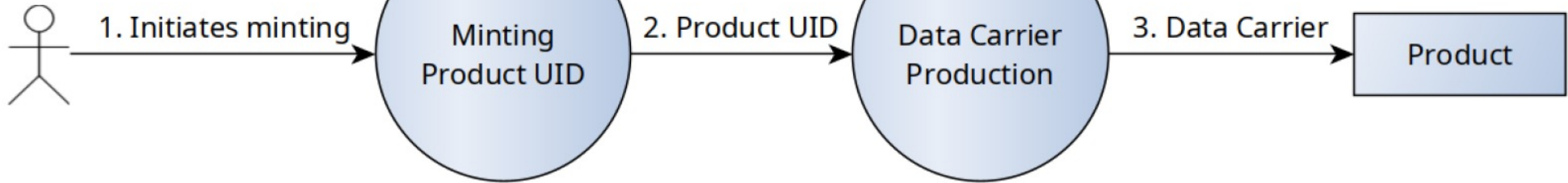
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HTTP Structure

DID-Structure

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DPP Plain Data User

DPP Priviledged Data User (with VCs)

Responsible Economic Operator (REO)

Facility DIDs

Product DIDs

SHACL Control Engine

REO DIDs

EU Registry

Market Authority

DPP App, DID Wallet, & VCs

VCs

PDP

Decentralized DPP Data Repositories

Scanning Device

Data Carrier on Product

Product DID

Actor DID

DID Document

DPP Backup Service Providers

WEB

DL/EBSI

VDRs

DPP Archive like Internet Archive

DPP Creation

Making a UID/URI & a Data Carrier

Steps for DPP issuing (maximum data re-use)

Using the DPP

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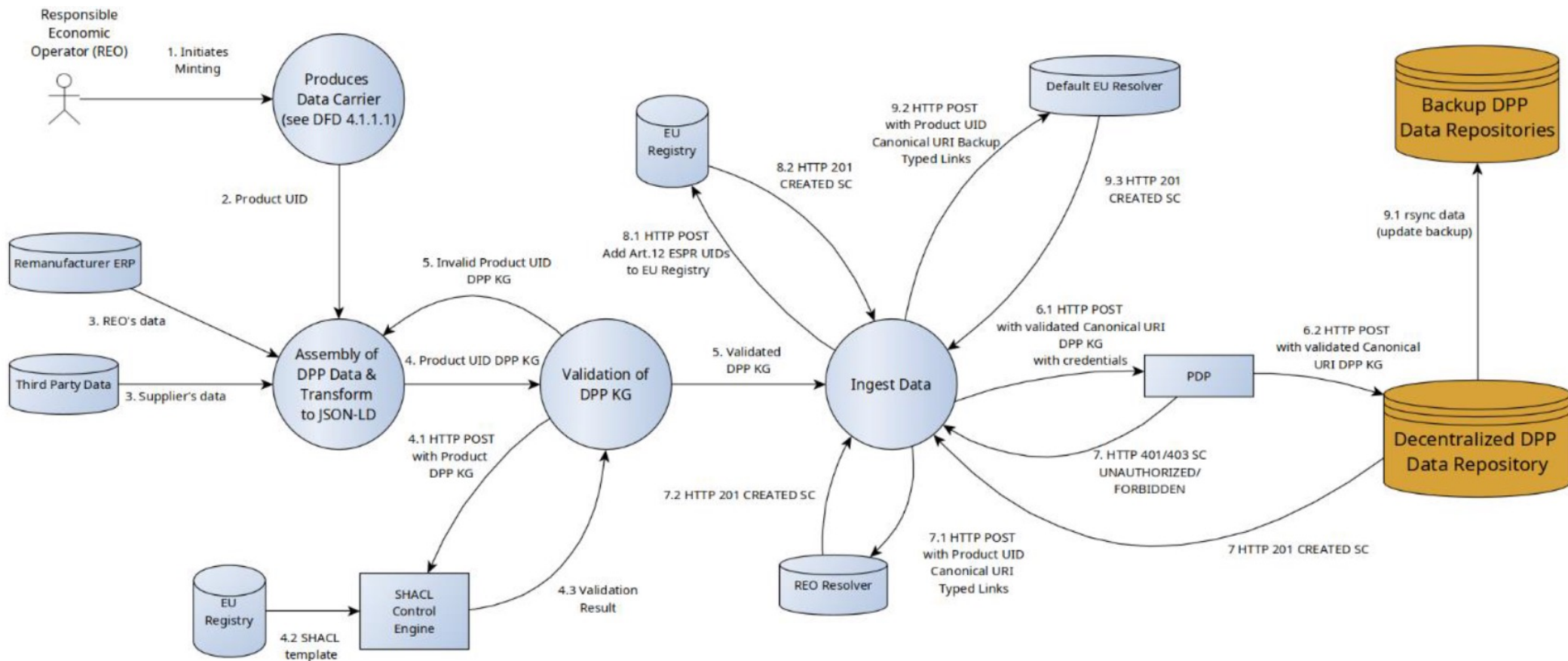
Simplified: Consumer Info (HTML)

Phone cc/ASA by JorgenQ

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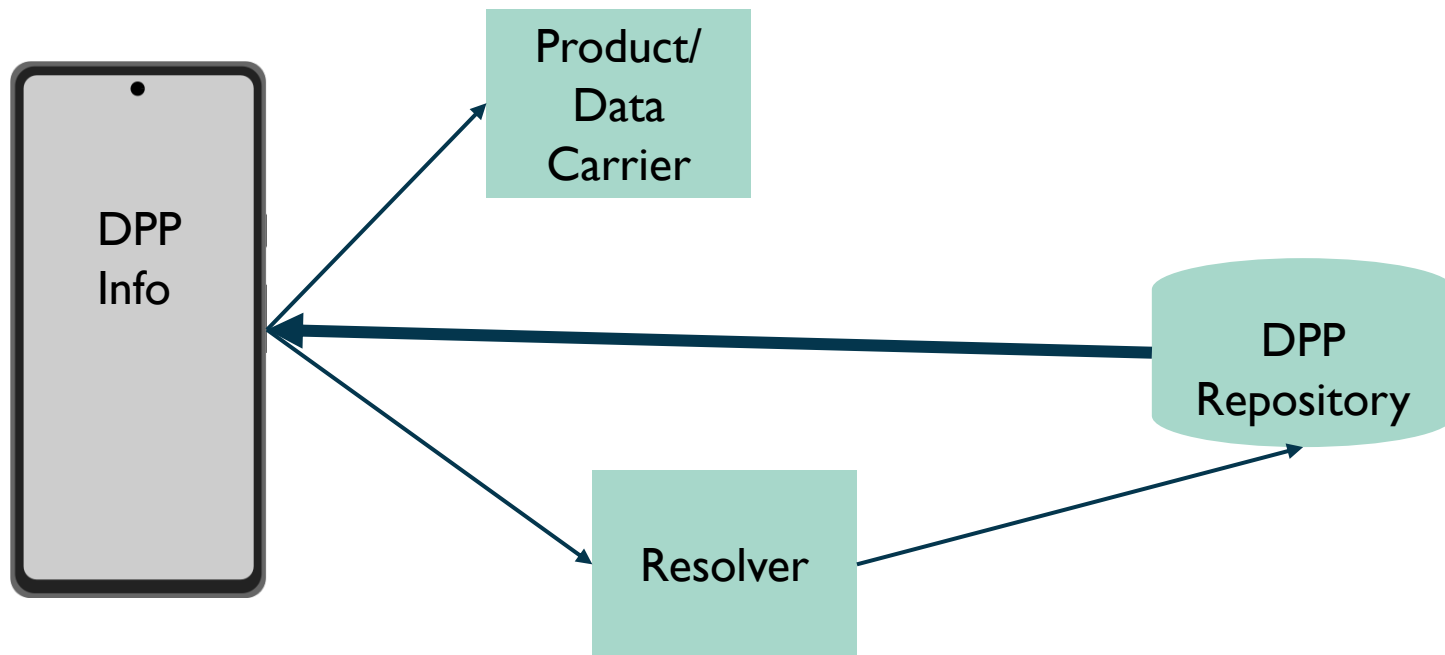
Default: Public Consumer Info (HTML)
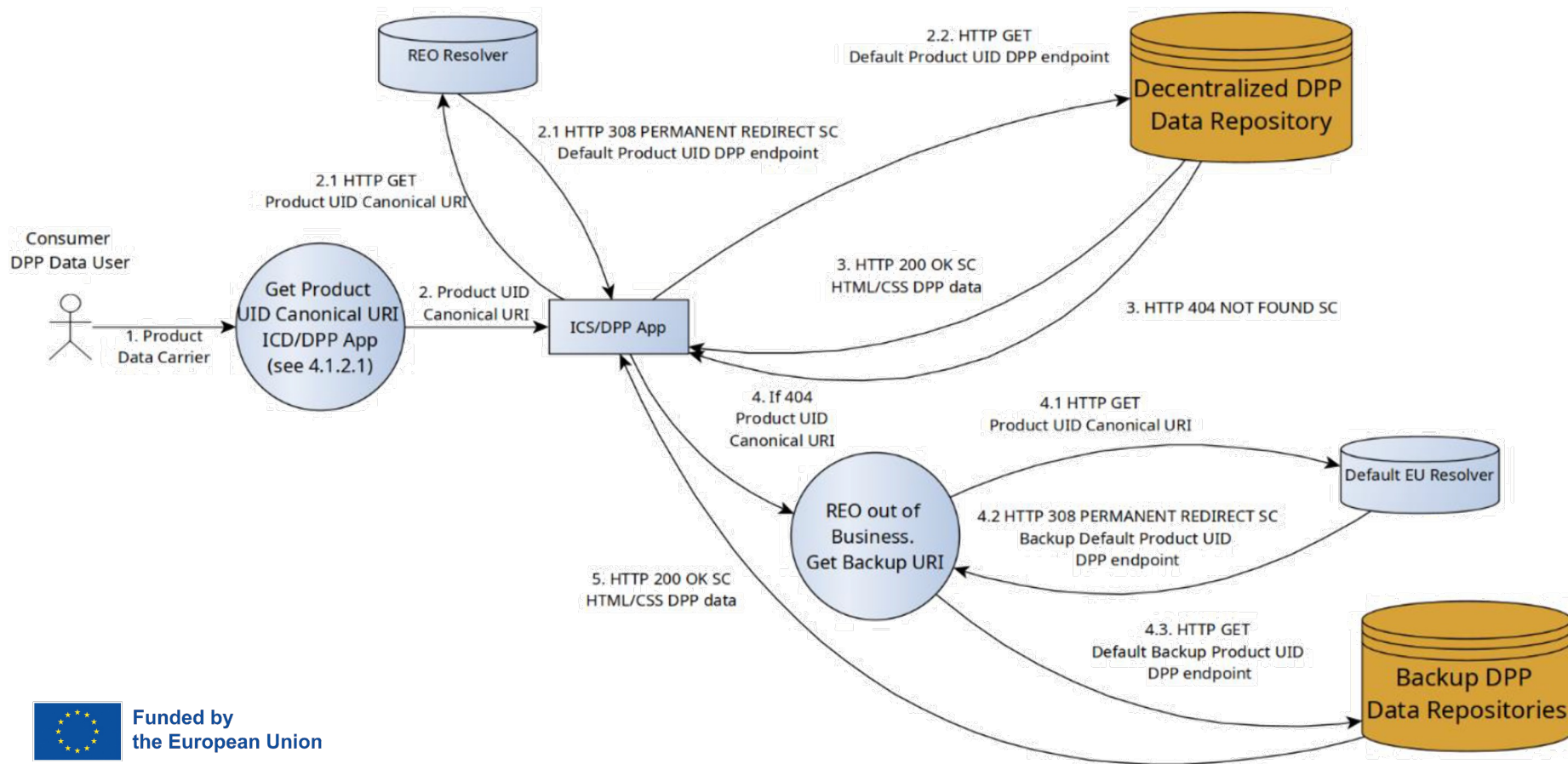
CEOPs may need privileged data

Product/
Data
Carrier

REO
Identity
Management
or eID

DPP structured Data RDF/JSON-LD

DPP Data
Repository

Resolver

ACL
Policy Decision
Point

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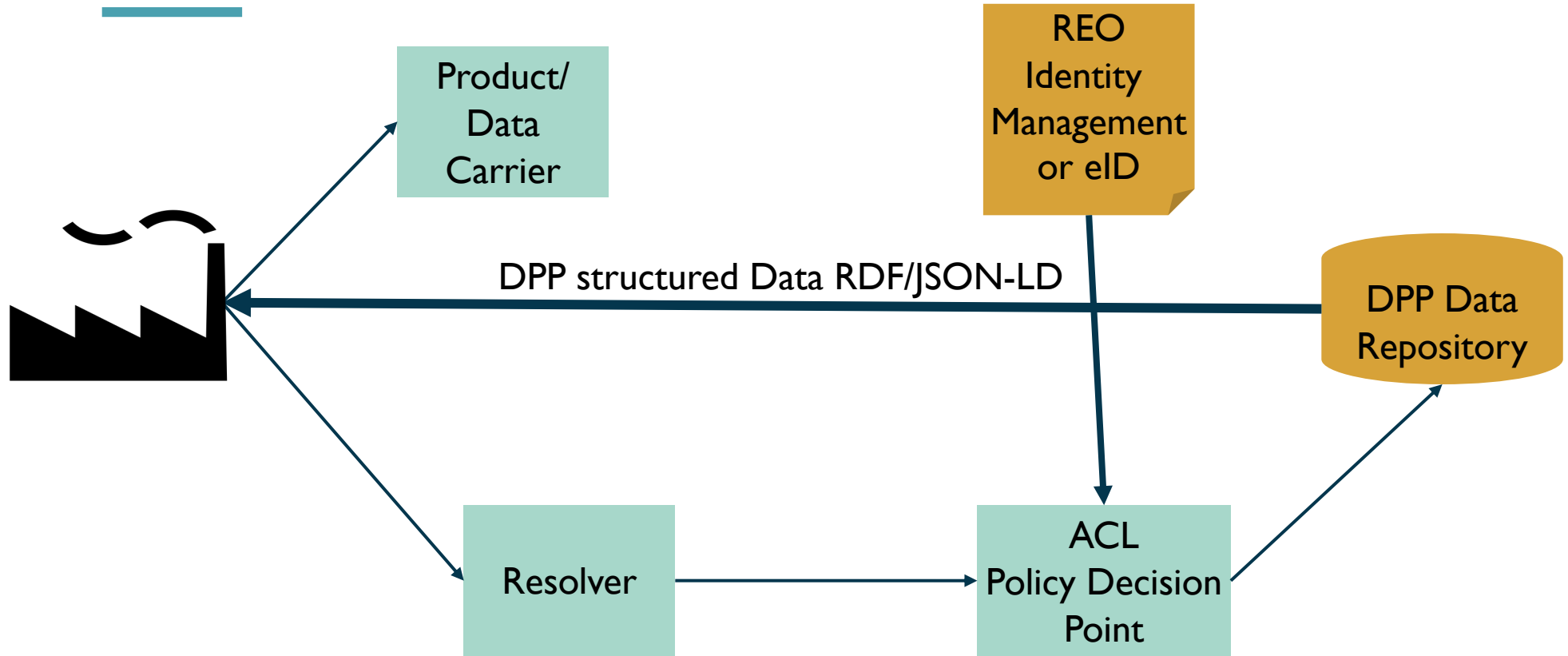
CEOP: Privileges need to be managed
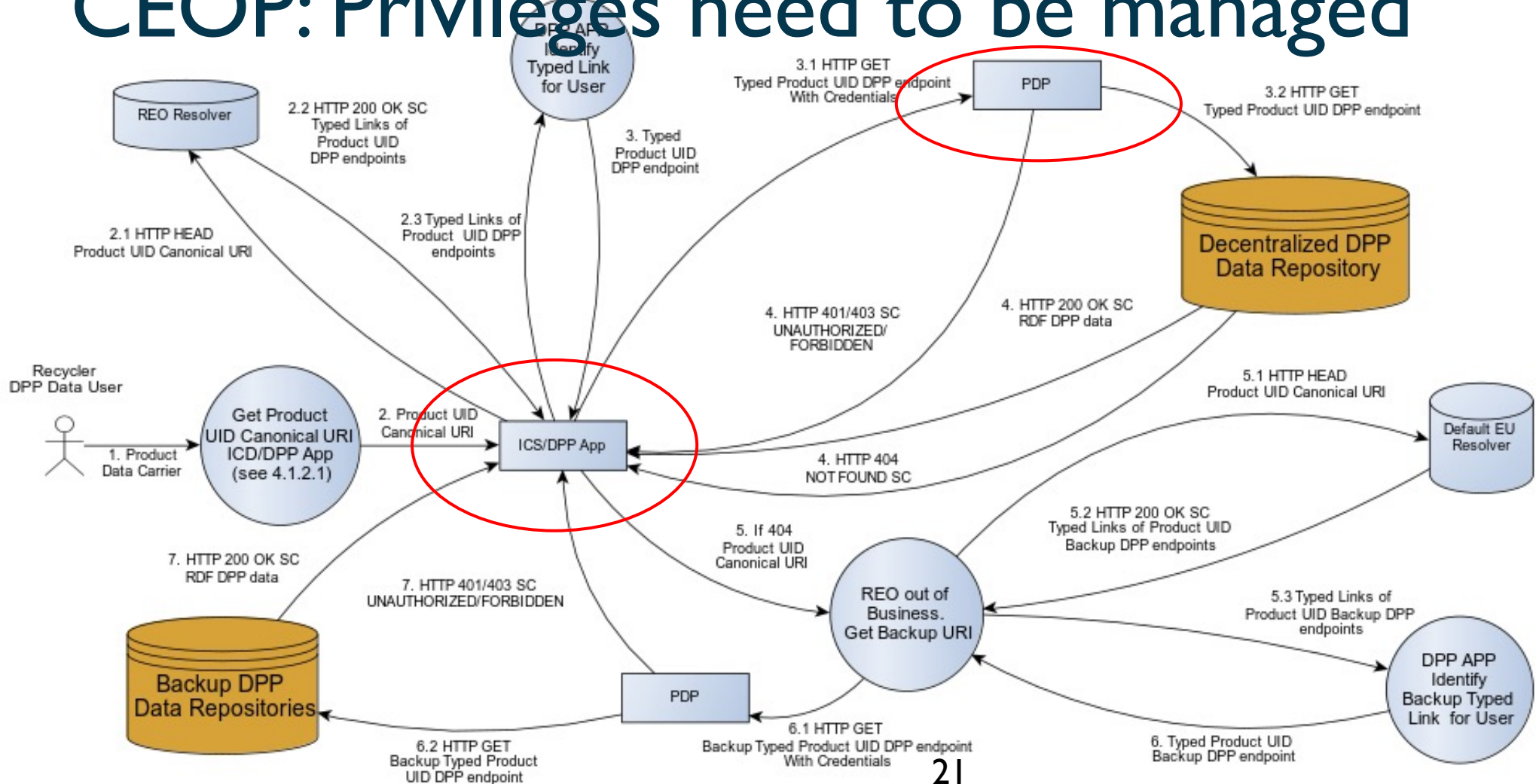
DPP Data Repo is a concept

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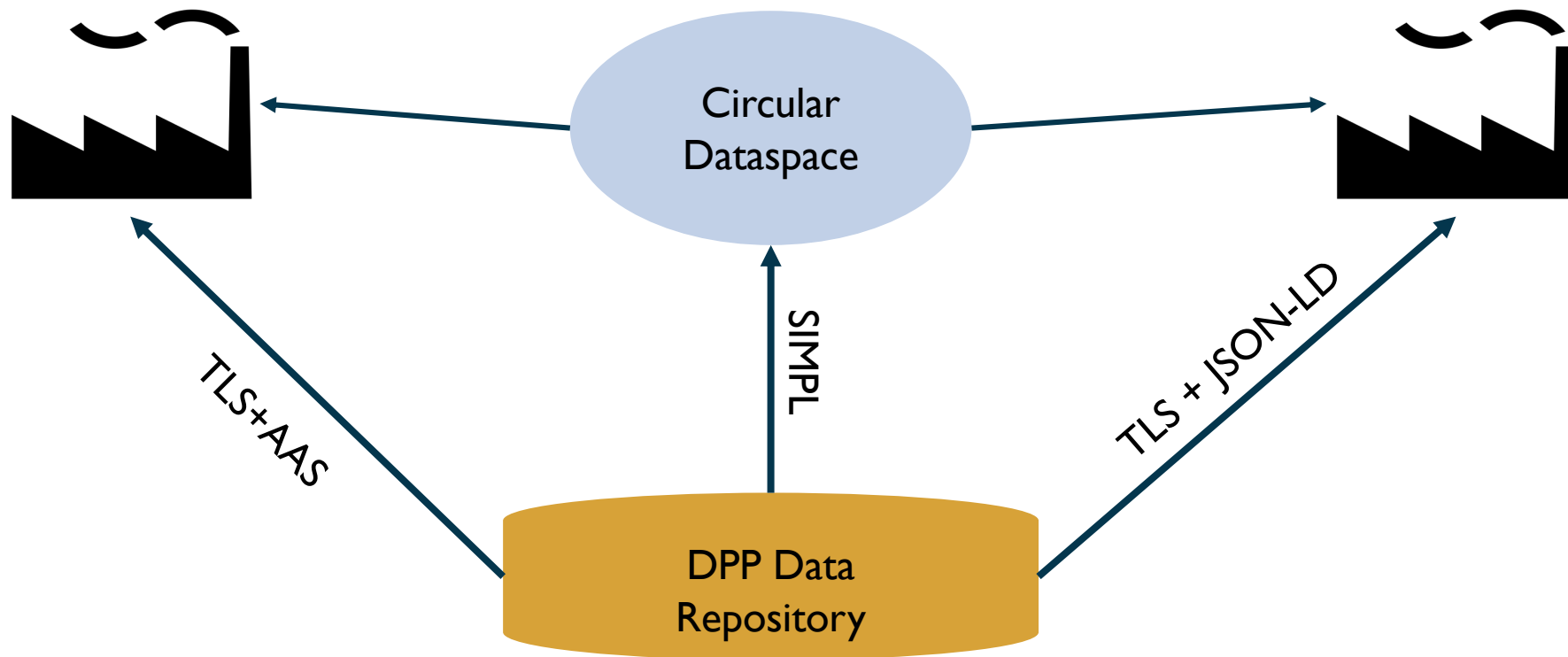
Conclusion

- Internet/Web based system
  - Standards-based level playing field
- Flexible & highly interoperable
  - Can digest a large variety of solutions
- Combinable:
  - All nodes can be services
  - Data from a variety of sources can be merged
- Extensible (can integrate into the EU data strategy)

https://cirpassproject.eu/

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