



DKE



Federal Ministry
for Economic Affairs
and Energy



Digital Product Passport: Open Source Reference Implementation Workshop

Welcome!





Open Source Communities

Michael Plagge, VP Ecosystem Development

The Leading Open Source Foundation in Europe



**Community Driven.
Code First.
Commercial-Friendly.**



The Community for Open Collaboration and Innovation



**You said
“Open Source?”**



There is only one definition of Free Software (since 1984) and Open Source is synonymous!

Freedom 0 -

to **run** the program, for any purpose

Freedom 1

-to **study** how the program works, and change it to make it do what you wish

Freedom 2 -

to **redistribute** copies

Freedom 3 -

to distribute copies of your **modified** versions to others

Open Source is a flavor of Intellectual Property management



Today, you can't develop software without doing open source!

— Mercedes Benz



81%

% companies consuming open source in products or services

44%

% firms contributing to upstream open source projects

80-90%

Open source makes up 80-90% of applications

Sources: TODO Group, Forrester

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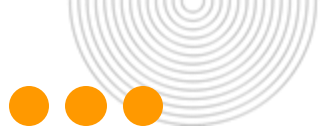
More than a **licence or code**

`“If you have great code and a dysfunctional community, people will leave and the code will atrophy. If you have dysfunctional code but a great community, people will improve the code.”`

The Apache Way

— Community before code

What is not **open source!**



1 →

Pushing your code to GitHub just for the review.

Abandonware

2 →

Forgetting to add a proper OSI approved licence to your project.

OSS is voluntary

3 →

Source-available licences put restrictions on the use of the software, while true open-source licences do not.

4 →

Ethical source licences put restrictions on the use of the software, while true open-source licences do not.

The legend!



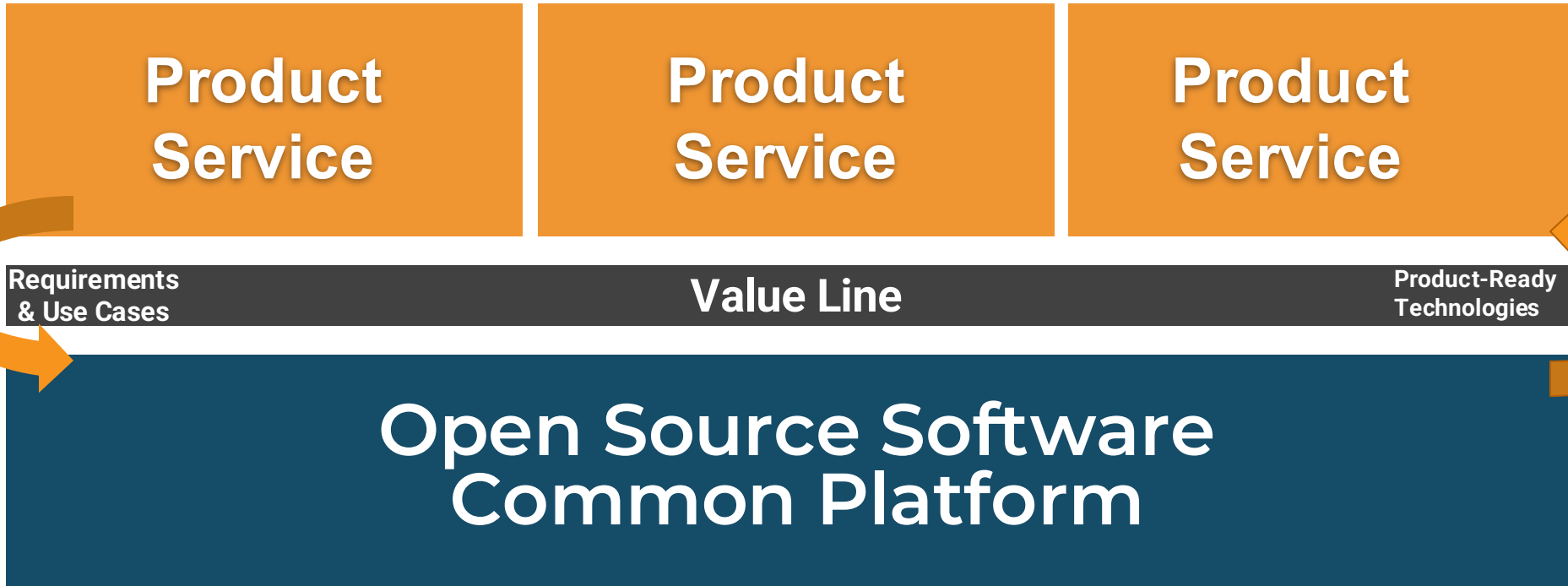
The reality: 90% of the linux kernel is done by corporate developers!



Most active 6.6 employers

By changesets			By lines changed		
Linaro	1333	9.5%	Red Hat	56102	9.5%
Intel	1221	8.7%	Linaro	48883	8.3%
Huawei Technologies	962	6.8%	Intel	47457	8.0%
Red Hat	940	6.7%	NVIDIA	38849	6.6%
Google	937	6.7%	Google	37066	6.3%
(Unknown)	802	5.7%	AMD	26928	4.6%
AMD	635	4.5%	(Unknown)	23112	3.9%
SUSE	590	4.2%	Oracle	18228	3.1%
(None)	505	3.6%	(None)	18014	3.0%
NVIDIA	428	3.0%	IBM	17588	3.0%
Oracle	400	2.8%	SUSE	16278	2.8%
Meta	338	2.4%	Cirrus Logic	15110	2.6%
vivo Mobile Communication Co	333	2.4%	Meta	13967	2.4%
IBM	311	2.2%	Huawei Technologies	13436	2.3%
Renesas Electronics	257	1.8%	Qualcomm	12773	2.2%
Qualcomm	229	1.6%	Texas Instruments	12036	2.0%
NXP Semiconductors	207	1.5%	Loongson	10559	1.8%
Pengutronix	176	1.3%	Collabora	10388	1.8%
Collabora	139	1.0%	Ideas on Board	8083	1.4%
(Consultant)	132	0.9%	MediaTek	8063	1.4%

Open Collaboration: a business-friendly ecosystem

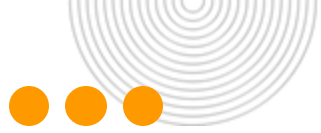


Compete on products & services

Working with your competitors based on **meritocracy**

Open, Transparent, Vendor-neutral, Collaboration platform

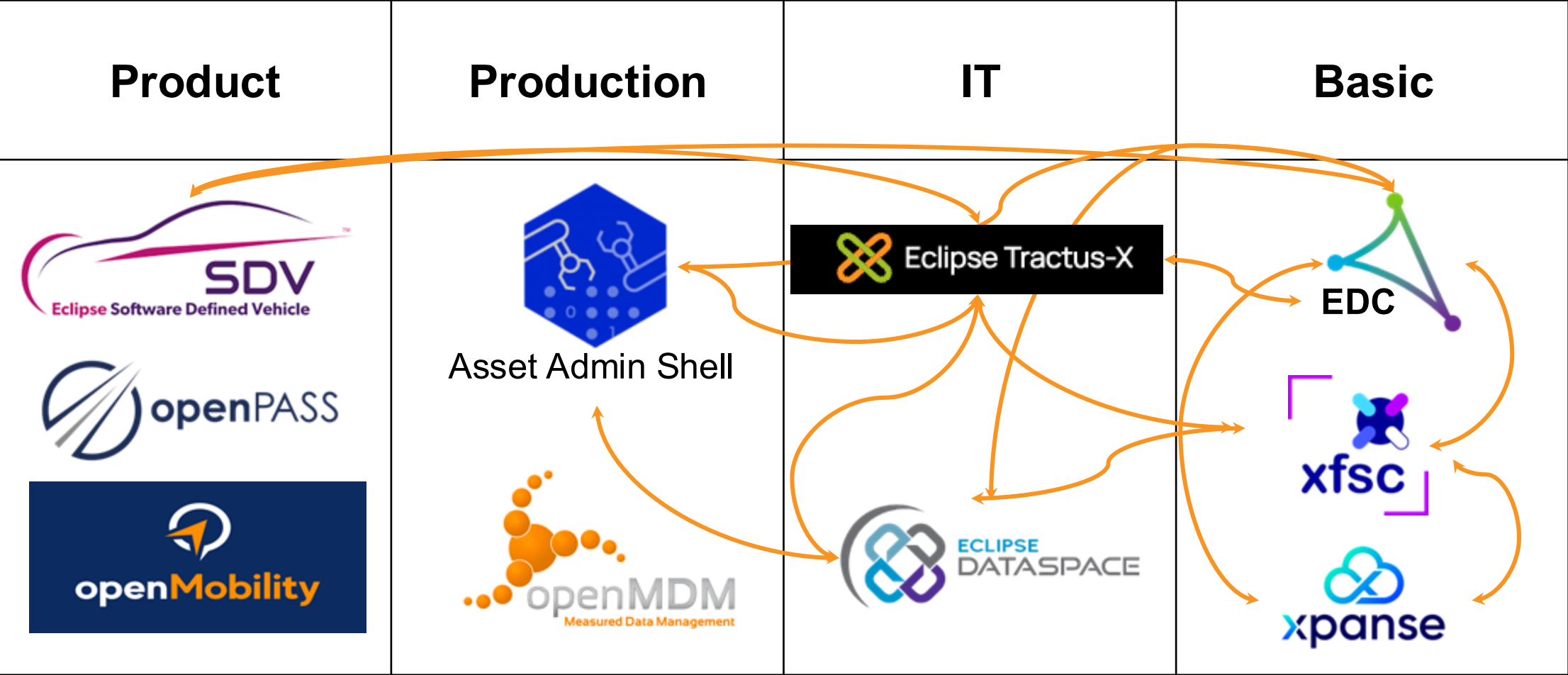




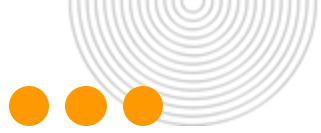
The **Open Source** journey

- 2001 definition of a healthy open source project:
 - It works and it solves a business or technical problem
- 2026 definition of a healthy open source project:
 - Working, secure, and carbon-neutral code, delivered on an environmentally friendly, sustainable, predictable, repeatable, and supply-chain secure basis with millions of users and thousands of GitHub stars, along with a plethora of adopters and a large, dynamic ecosystem all delivered by a diverse and welcoming community governed in an open and transparent manner with a commitment to equity and social justice.

One Governance adds value



Why **Open Source** may not be enough



Open Collaboration

Contribution

- Transfer of IP rights
- Future influence

Collaboration

- Rules for collaboration (Governance)
- Predictability
- Sustainability

Open Source

Adoption

- Open Source License
- Four Freedoms



Transparency



Openness

**Open Source
Best Practices**



Vendor-Neutral



Meritocracy

Meritocracy ⇒ The ones who do are right!



- Developers contribute as individuals
- They have to prove their skills and commitment
- Nobody can be “appointed” as a committer!

Code Contributions

- Download and use the code
- Report bugs and suggest features
- Fix bugs and implement features
- Become a Committer
- Mentor and support others

Non-Code Contributions

- Follow, like, or promote a project on social media
- Write a blog or create a video
- Give a talk
- Attend an event
- Organise an event



User



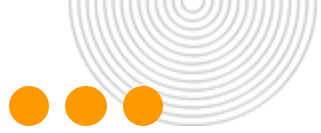
First-time
Contributor



Regular
Contributor



Committer /
Lead / Mentor



How decisions are made: **Projects**

Internal relevant bodies & Decision makers: group of committers & project lead (PL)

Decisions to make: features & roadmap, timelines, applicable processes (e.g. maturity badges for safety relevant artifacts), releases, acceptance of pull requests, prioritisation of issues, Hackathons participation, project collaboration

Default decision processes:

- Lazy consensus (features & roadmap, timelines, processes, releases)
- Individual committer/PL decision (acceptance of pull request, prioritisation of issues)

Means to formalize decision processes: project documentation (complex projects have votes to formalize decisions) (technical solutions available for 4-eyes principle)

Escalation level: PMC and EMO (governance only), no escalation level for technical decisions.

Mitigation options: forking, (merging of projects, project archivation)

Other relevant bodies (external): Project Management Committee (PMC), Eclipse Management Office (EMO), WG Technical Alignment Committee (TAC)



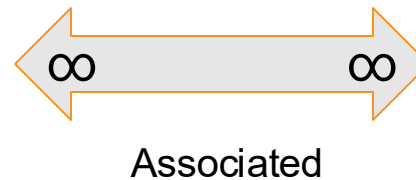
Projects and Working Groups

(or the definition of “project”)

Projects



Transparent
Open
Vendor-neutral



Group of individuals

- Build code, APIs, documentation
- Meritocracy
- No costs / No budget
- Sponsoring possible

Industry Collaborations (Working Groups)



Group of organizations

- Focus, promote and augment Eclipse technologies
- Open Governance
- Fees / Budget



Golden Rules

- We are **code** first (but not code only)
- Projects are **self-governing** to enable community driven success.
- Aim for success by selecting **robust, sustainable, well engineered projects**.
- **No kingmakers**. Similar or competitive projects are not excluded for reasons of overlap or competition.
- **Don't reinvent the wheel**. Adopt and promote useful work happening in other industry groups.
- **No single stack**. Encourage interoperability for the emergence of a variety of stacks and distributions to serve the community and adopters.
- Define specifications derived from **open source projects** which have demonstrated broad adoption and real world use.
- We want to build **production grade software** which will be used in production.
- We are here to **help our projects**.

2nd iteration MoU unveiled during CES 2026

Eclipse SDV Executive Breakfast

A united, global ecosystem

With today's news, this MoU group expands to become one of the world's largest and most advanced open source ecosystems focused on code-first solutions for next-generation mobility. New signatories include an array of industry leaders and innovators, such as 42dot, Accenture, AVL, Capgemini, Coretura, Cummins, ECARX, Elektrobit, Infineon, LEAR, LG Electronics, Michelin, MOBIS, QNX, Qualcomm, Red Hat, Schaeffler, Traton, Stellantis, T-Systems, and Useblocks joining founding participants Aumovio, BMW, Bosch, ETAS, Hella, Mercedes-Benz, Qorix, Valeo, Vector, Volkswagen, and ZF.



Date: 7th January 2026



Location: Conrads Resort World Las Vegas, Blossom Ballroom



Central topic: unveil the 2nd iteration of the OSS MoU

Auto industry expands open-source pact to boost development, cut costs

By Rachel More

January 7, 2026 1:10 PM GMT+1 · Updated January 7, 2026



<https://www.reuters.com/business/auto-industry-expands-open-source-pact-boost-development-cut-costs-2026-01-07/>



Growing to a global ecosystem

to now more than 30 companies from America, Europe, and Asia

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42dot 42 dot Inc.	Song Chang Hyeon CEO	
AVL AVL List GmbH	Di Georg List Vice President Corporate Strategy	
accenture accenture	Dr. Christof Horn Global Lead SDV	
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Cummins Cummins Inc.	Jonathan Wood Vice President & Chief Technical Officer	
ecarx ECARX PTE. LTD.	Nicolas Persignat Executive VP, Head of Global R&D	
88 Elektrobit Elektrobit Automotive GmbH	Maria Anhalt CEO	
Infineon Infineon Technologies AG	Peter Schiefer President and CEO of the Automotive Division	
LEAR CORPORATION LEAR Corporation	Nick Roelli President E-Systems	
LG Electronics LG Electronics Vehicle Solution	Seok-hyun Eun President	

 MICHELIN	Dr. Ali Rezzgui VP Embedded Tire Digital Twin	
HYUNDAI MOBIS Hyundai Mobis Automotive Electronics Business Unit	Sookyung Jung Head of Automotive Electronics Business Unit	
QNX QNX	John Wall Chief Operating Officer QNX, Head of Product, Engineering & Services	
Qualcomm Qualcomm Technologies Inc.	Nakul Duggal EVP, Group GM, Automotive, Industrial and Embedded IoT, and Robotics	
 Red Hat Red Hat Inc.	Chris Wright CTO & SVP Global Engineering	
STELLANTIS Stellantis LLC	Tara Vatcher Global SVP - Core Platform SW Development and Architecture	
SCHAEFFLER Schaeffler AG	Uwe Wagner Chief Technology Officer	
TRATON TRATON SE TRATON AB	Niklas Klingenberg Head of Group R&D TRATON SE David Holmgren Head of Group R&D EE Applications TRATON AB	
T-Systems T-Systems	Dr. Christian Hort SVP Automotive & Manufacturing Jörg Tischler VP Connected Mobility	
 USE BLOCKS Useblocks GmbH	Daniel Woste CEO	



Workshop Goals

Must have

- Discuss the feasibility of an industry grade Open Source DPP implementation
- Contribution to a scalable, SME-friendly DPP ecosystem with reduced fragmentation
- define next concrete step (next meeting, project proposals, working groups)

Nice to have

- Shared vision of a modular, interoperable DPP reference architecture
- Outline of a potential implementation roadmap (towards production-ready solutions)
- Financing & Funding Options

Inherent

- Understand the benefits of an open collaboration under a mature governance model
- Agree on a community driven “Code First” approach (no long architecture discussions)
- Positioning of standardisation as a trust anchor for interoperability and compliance

Workshop Goals

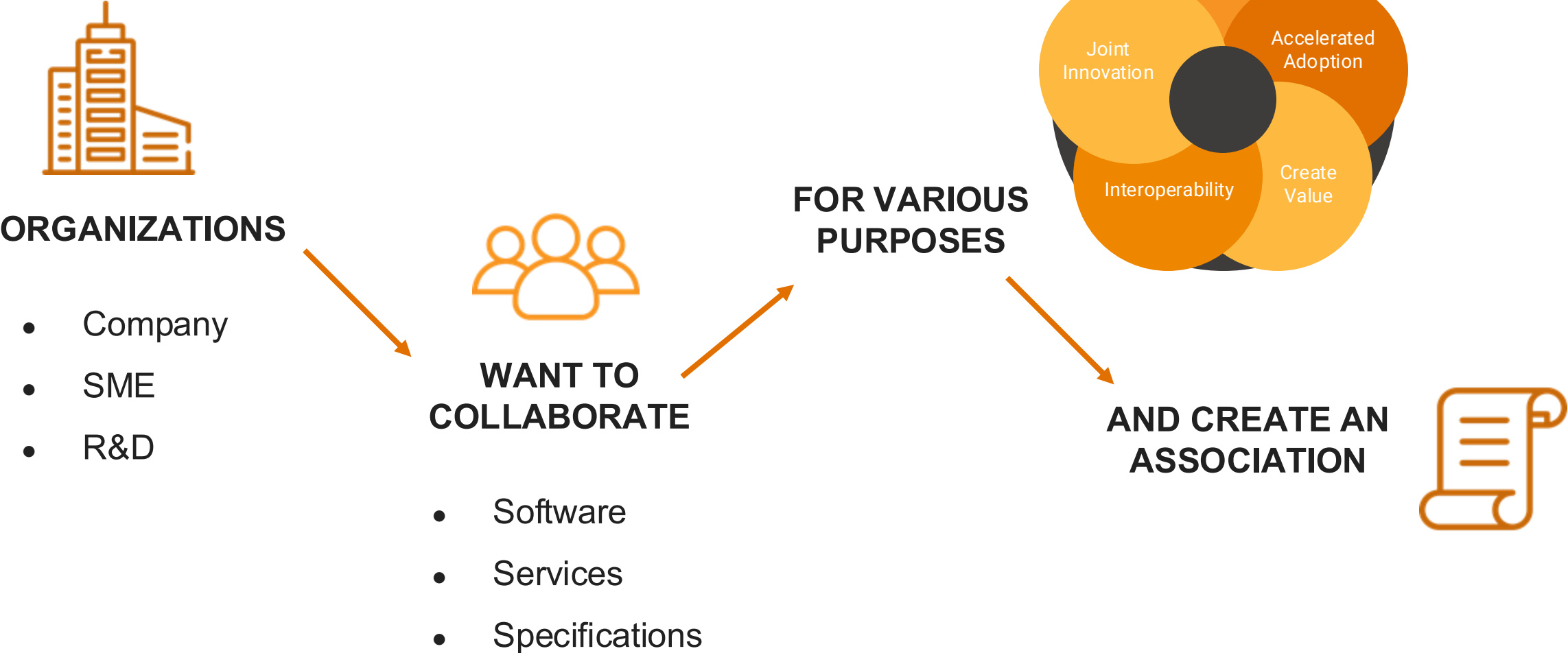
Breakout sessions

- Alignment on how Open Source and Standardisation can cross-pollinate for a faster time to market with high quality & trust
- Potential implementation plan including timeline (backwards planning from the time a solution should be available)
- Define the “Value line”: Identify potential business cases on top of the Open Source Platform implementation.
- Initial definition of the “value line” (business models on top of OSS, incl. APIs & compliance services)
- Identify potential building blocks for such an Open Source Software implementation
- Identify also existing proprietary components which could be open sourced by relevant organisations to jumpstart the development



**The Eclipse
Foundation enables
sustainable, vendor-
neutral,
open collaboration**

How an Association is Made



Purposes of an Association



GOVERNANCE

- Antitrust
- Bylaws
- IP Management
- AoA
- Processes



OPERATIONS

- Specifications
- Development
- Community
- Infrastructure



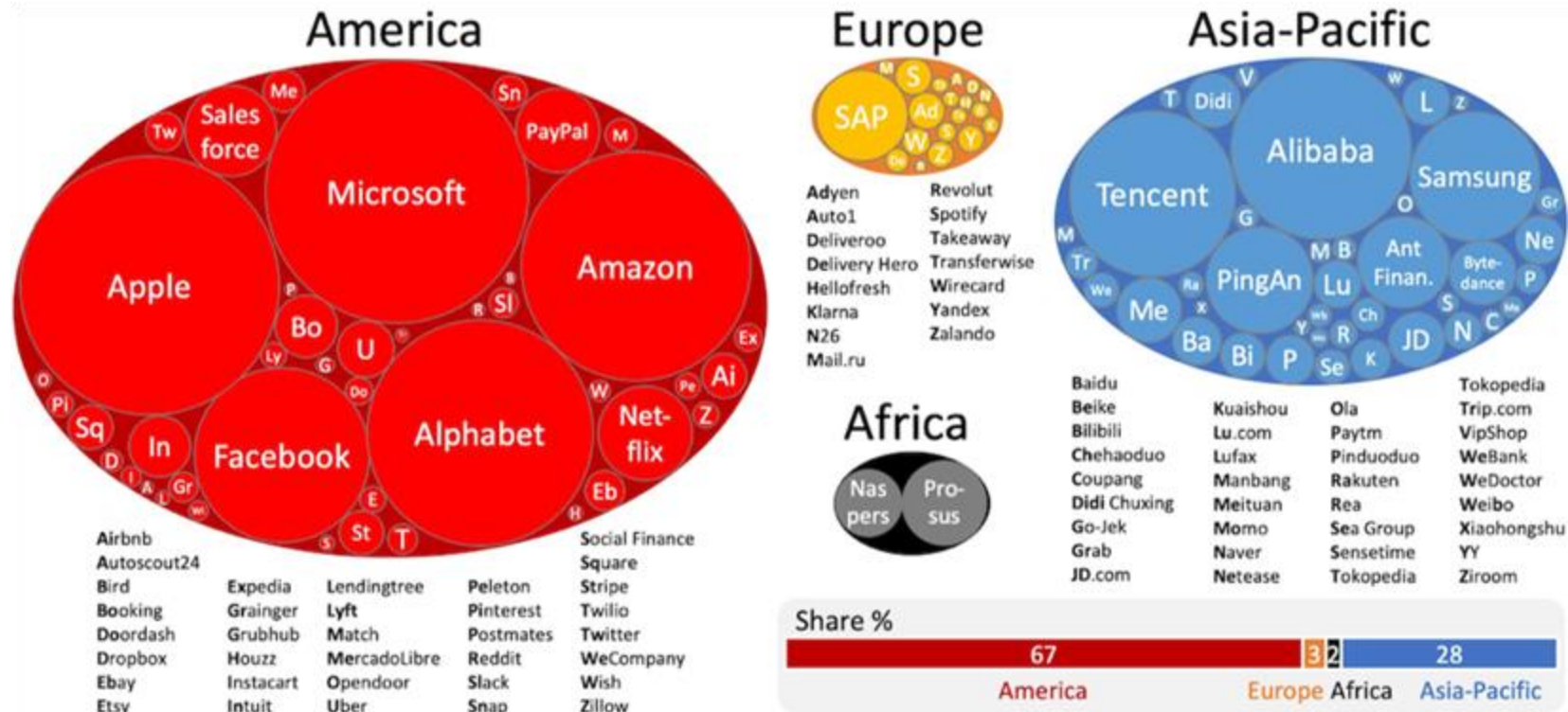
Hidden Motivation

- Maintaining Control
- Licensing
- Gatekeeping

Aims for this Workshop

- Discuss the feasibility of an industry grade Open Source DPP implementation
- Identify potential building blocks for such an Open Source Software implementation
- Identify also existing proprietary components which could be open sourced by relevant organisations to jumpstart the development
- Agree on a community driven “Code First” approach (no long architecture discussions)
- Understand the benefits of an open collaboration under a mature governance model
- Define the “Value line”: Identify potential business cases on top of the Open Source Platform implementation
- Potential implementation plan including timeline (backwards planning from the time a solution should be available)
- Alignment on how Open Source and Standardisation can cross-pollinate for a faster time to market with high quality
- define next concrete step (next meeting, project proposals, working groups)
- Needed Resources / FTE / budget

The platform economy

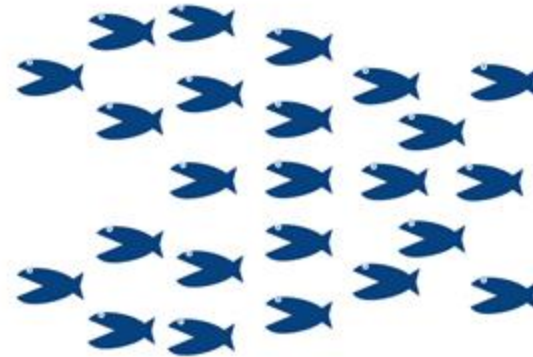


Playing the Platform Game ... and Win

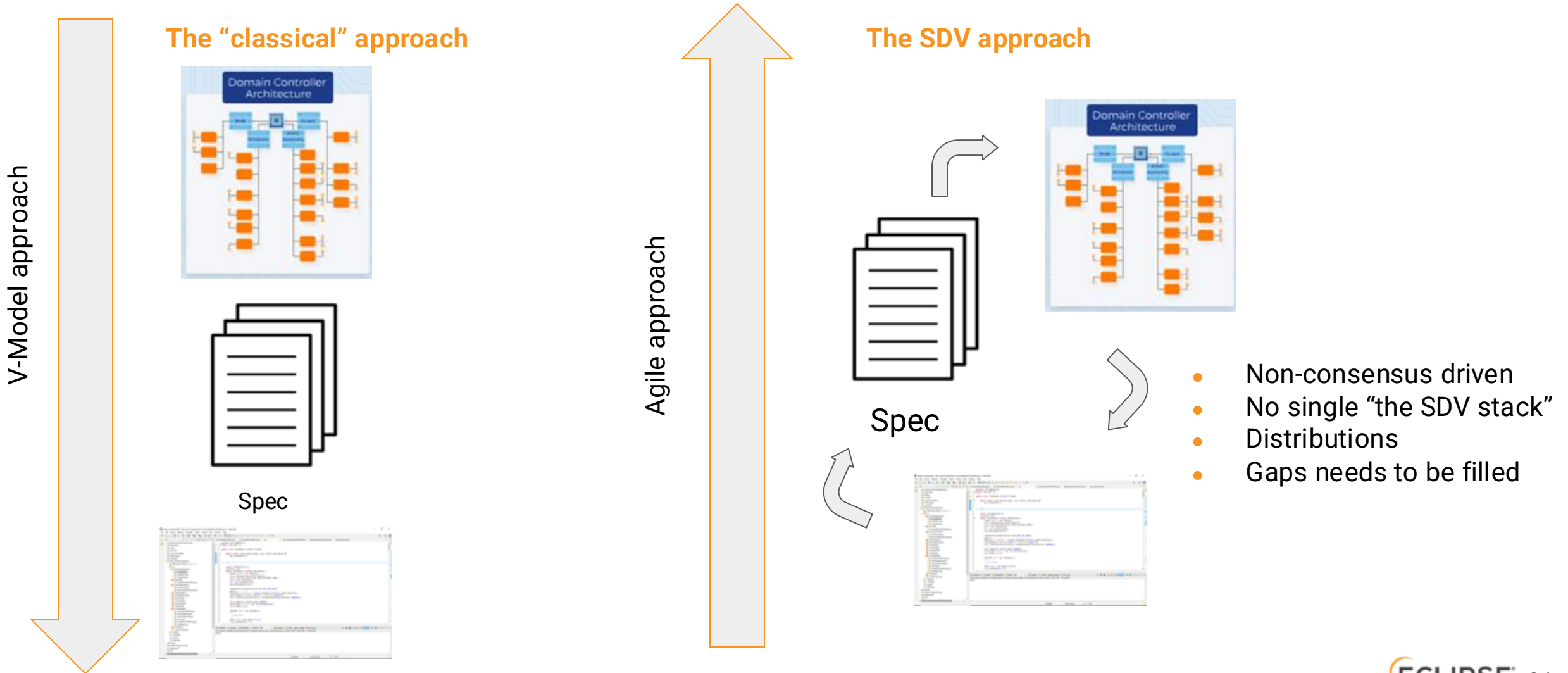
Big fish eat small fishes



... but small fishes
can build swarms



The SDV development model:



Automotive industry signs Memorandum of Understanding

Automotive industry signs Memorandum of Understanding for joint software development based on open source

Press release



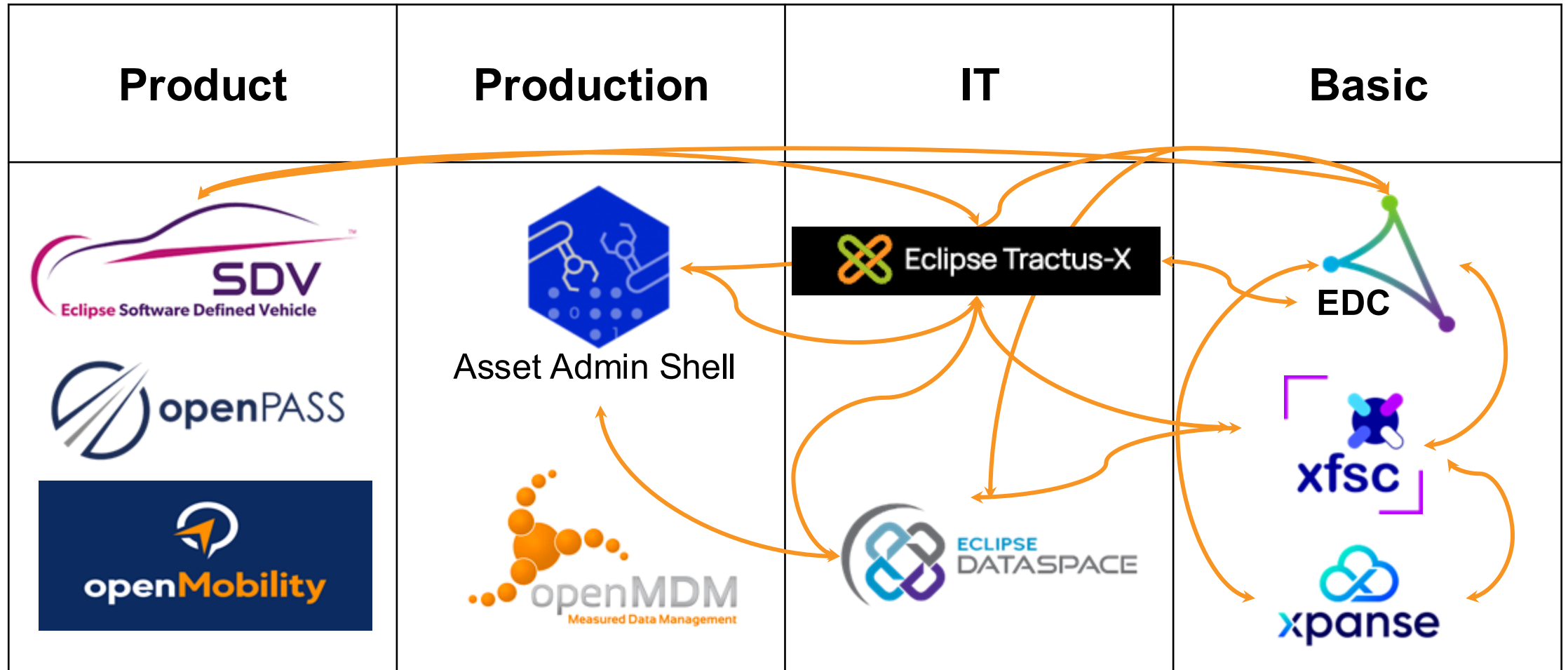
Ludwigsburg, June 24, 2025

Collaboration for more speed, efficiency, and security in software development and the basis for an open and collaborative ecosystem

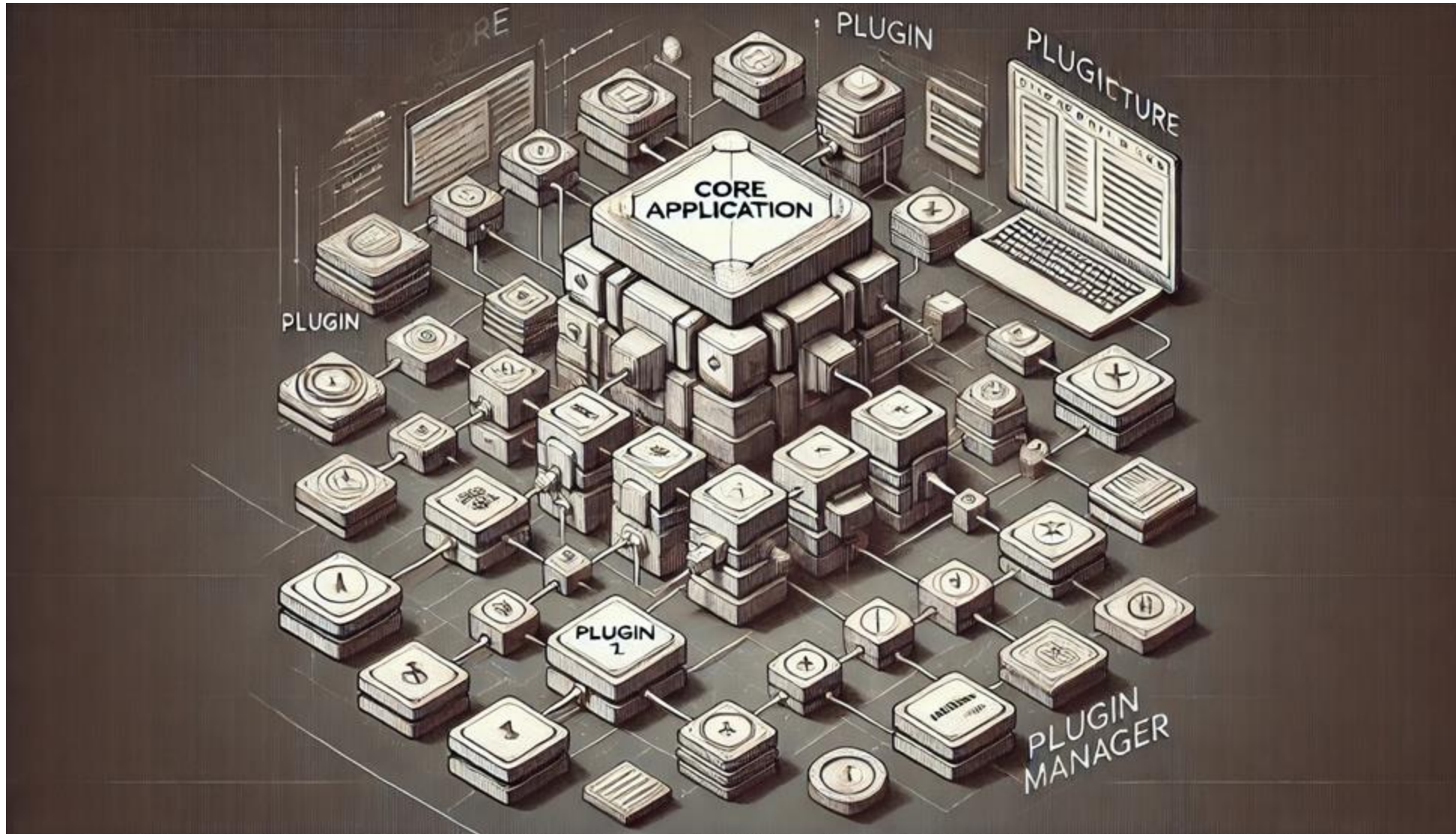
With the support of the German Association of the Automotive Industry (VDA), 11 companies in the automotive industry have agreed on pre-competitive cooperation in open source software development.

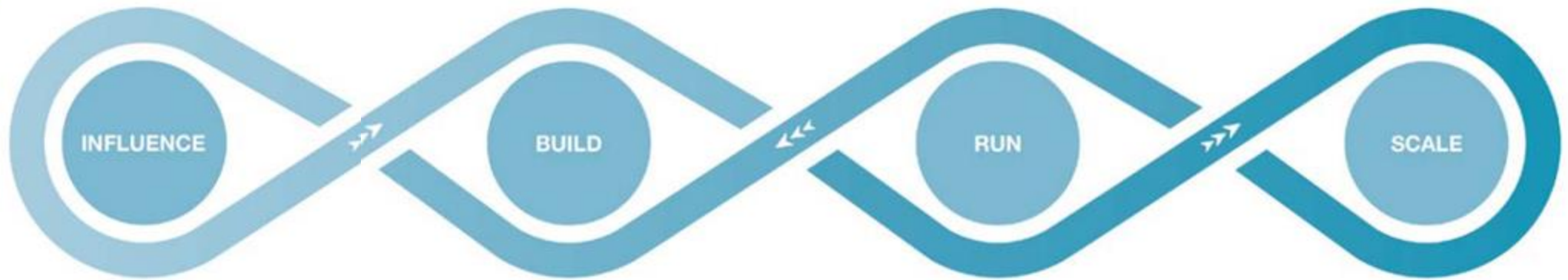
A corresponding Memorandum of Understanding (MoU) was signed today at the 29th International Automotive Electronics Congress (AEK).

One Governance adds value



An extensible architecture enables an ecosystem



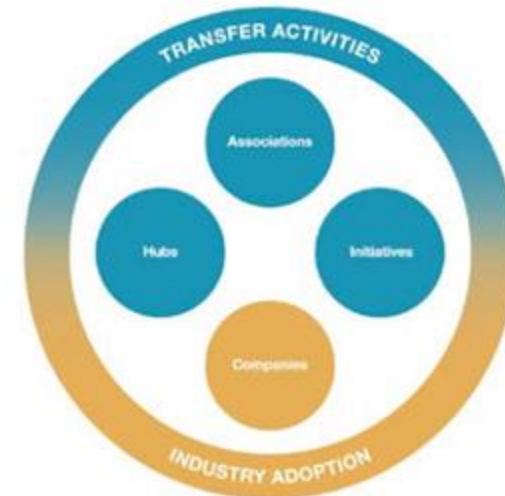
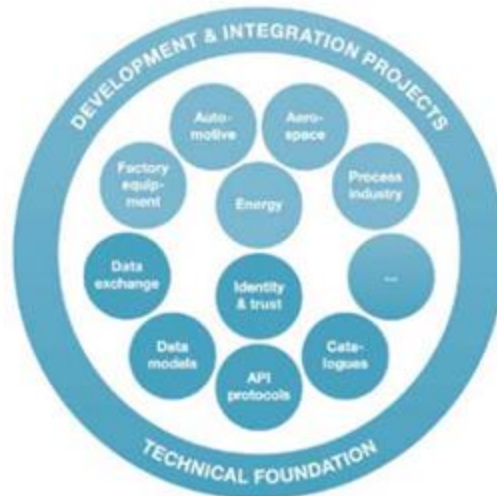


ALIGN OBJECTIVES & VISION | AGREE GOVERNANCE & RULES | DESIGN CONCEPTS, PRINCIPLES & ROAD MAPS

DEVELOP OSS COMPONENTS WITHIN THE COMMUNITY TO SUPPORT USE CASES | INTEGRATE TECHNICAL BUILDING BLOCKS

SECURE AND TRUSTED OPERATION OF ENABLING AND VALUE-CREATING SERVICES IN A DISTRIBUTED MODEL

SME SUPPORT ACTIVITIES | CONSULT & TRAIN | PROVIDE TEST BEDS & TEST SUPPORT | USE CASE ROLLOUT



Your project community is the one you create!
Start the party ...



Photo by Alberto Bigoni on Unsplash

... and they may join!



Photo by [Aditya Chinchure](#) on [Unsplash](#)

Eclipse Tractus-X



Projects Supporters Collaborations Resources The Foundation

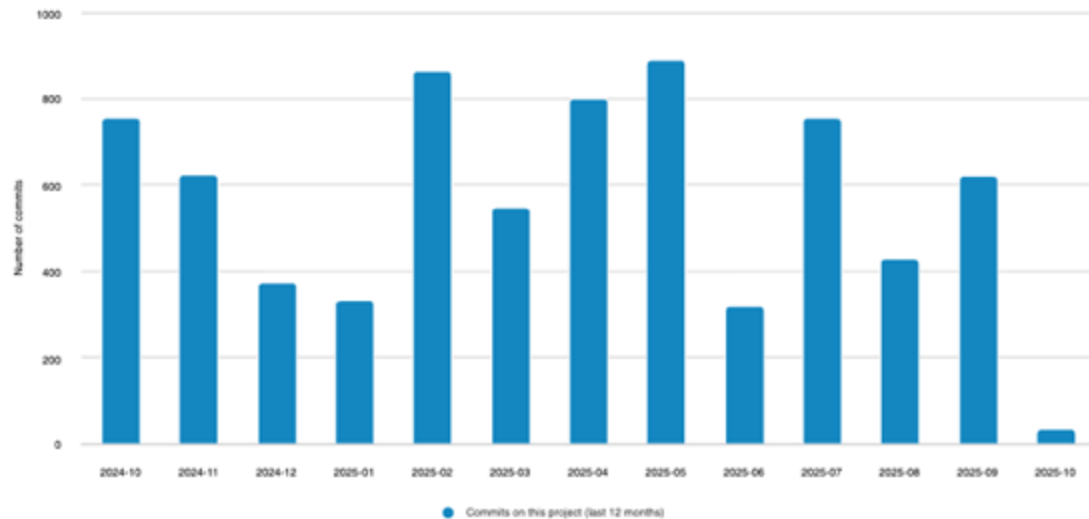
Home > Projects > Eclipse Automotive > Eclipse Tractus-X

Eclipse Tractus-X

Overview Downloads Who's Involved Developer Resources Governance Contact Us

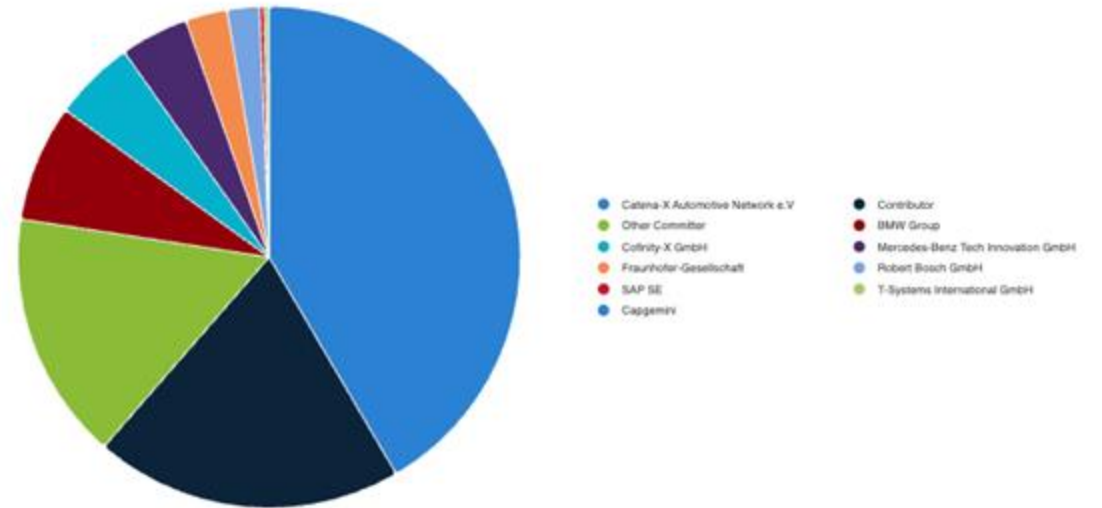
Contribution Activity

Commits on this project (last 12 months)



Organization Contribution Activity

Commits on this project by supporting organization over the last three months.



Active Member Companies

Member companies supporting this project over the last three months.



Eclipse Dataspace Components



[Projects](#) [Supporters](#) [Collaborations](#) [Resources](#) [The Foundation](#)

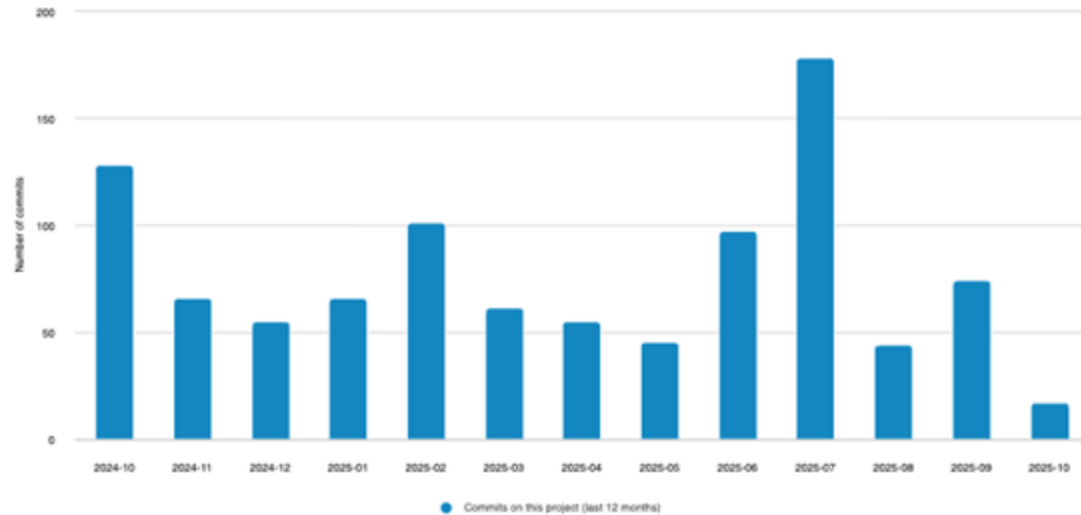
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Eclipse Dataspace Components

[Overview](#) [Downloads](#) [Who's Involved](#) [Developer Resources](#) [Governance](#) [Contact Us](#)

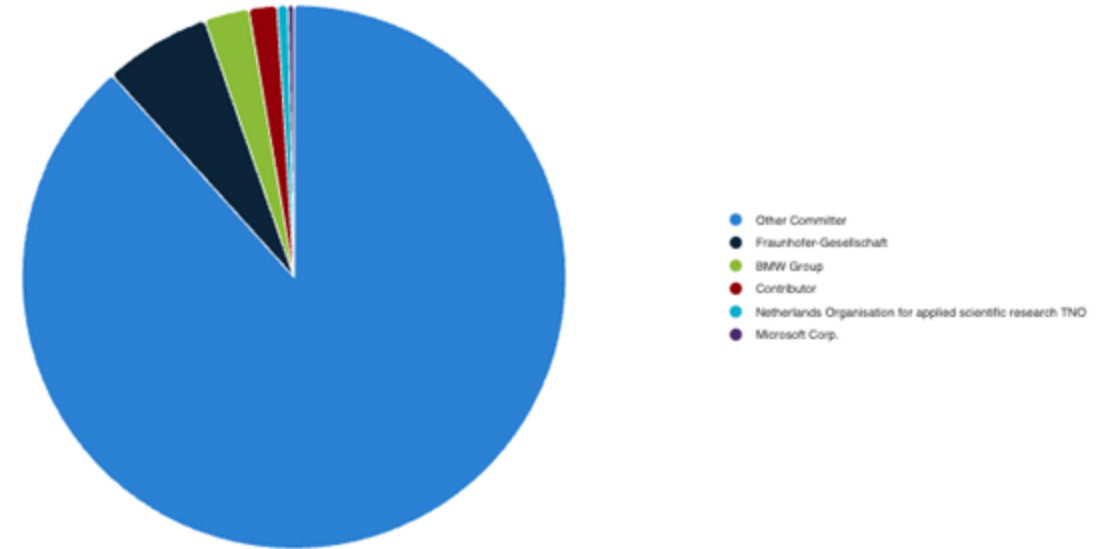
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Member companies supporting this project over the last three months.



Fifth

ECLIPSE TRACTUS-X COMMUNITY DAYS

04-05 December 2025
STUTTGART



 **ARENA2036**

 **Tractus X**

 **Catena-X**

 **ECLIPSE**
FOUNDATION



Federal Ministry
for Economic Affairs
and Energy

Politics & DPP

Digital Product Passport - Open Source Reference Implementation
Workshop, 29.04.2026

Volkmar Stein

ICT Standardisation, Regulation and Market Surveillance
Federal Ministry for Economic Affairs and Energy, GER

Beyond the label: DPP for trusted product information

- DPP is not just a new label.
- DPP is a digital information hub for trusted product information.

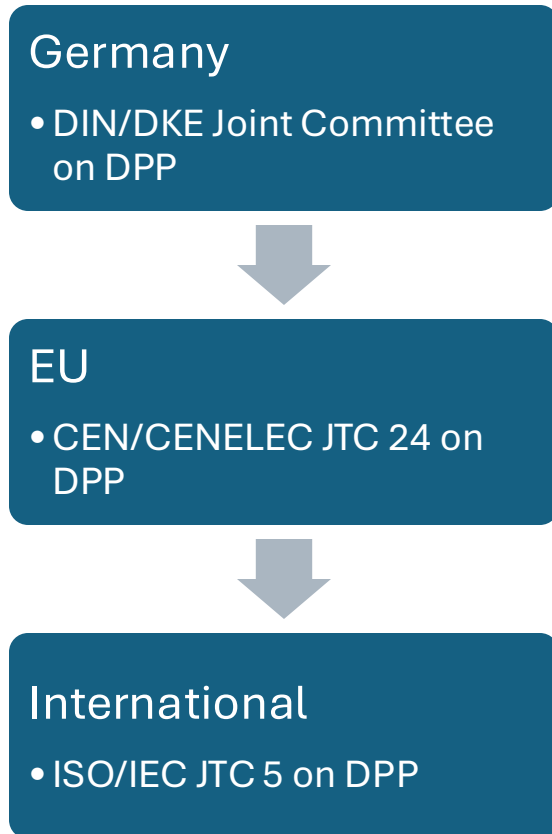


DPP - Europe's product compliance backbone

- Battery Passport, Regulation (EU) 2023/1542 - from 02/2027
- ESPR / Ecodesign for Sustainable Products, Regulation (EU) 2024/1781
- Other product legislation increasingly refers to DPP logic, toys etc.
- European Product Act / Omnibus IV: DPP discussed as **digital-by-default compliance tool**



Standardisation - from legal requirements to technical specifications



- European product law defines essential requirements only
- Harmonised standards provide technical specifications
- CEN/CENELEC JTC 24 is to deliver harmonised standards for the DPP System to the EU COM
- New ISO/IEC JTC 5 brings DPP standardisation to the international level



DPP for the Single Market: opportunities and risks

Opportunities:

- Easier access to compliance, circularity and lifecycle data
- Simpler compliance for the Single Market
- Facilitating repair, reuse, resale and recycling of products

Risks:

- Fragmented provider landscape and incompatible implementations
- Vendor lock-in and high service fees for companies
- Proprietary formats limiting interoperability and data reuse

Open Source DPP – A shared system for trusted product information

- Shared code base for core DPP functions
- Interoperable and vendor-neutral infrastructure
- Open to extensions for sectors, companies and use cases
- Shared and community-driven development and governance



Strategic benefits of an OSS DPP implementation

1. Technological Leadership and Economic Sovereignty

- International trade and regulatory alignment
- Economic sovereignty / strategic infrastructure

2. Bridging Standardization, Regulation and Industrial Deployment

- Operationalizing JTC 24 standards into production-ready code
- Trust anchor for best-practice compliance with JTC 24
- SME-ready compliance tool to reduce bureaucratic burden

3. Scalable Technology Platform

- Production-ready scalable DPP stack
- Suitable for commercial and non-commercial deployment
- Progressive adoption: from SME entry-level to Industry 4.0 integration
- Cross-sector integration
- Ecosystem coherence and prevention of siloed implementations
- Continuous technical evolution



Federal Ministry
for Economic Affairs
and Energy

Thank you very much!

Volkmar Stein

ICT Standardisation, Regulation and Market Surveillance

Federal Ministry for Economic Affairs and Energy, GER

Volkmar.Stein@bmwe.bund.de

50 YEARS
REINVENTING
PRODUCTION

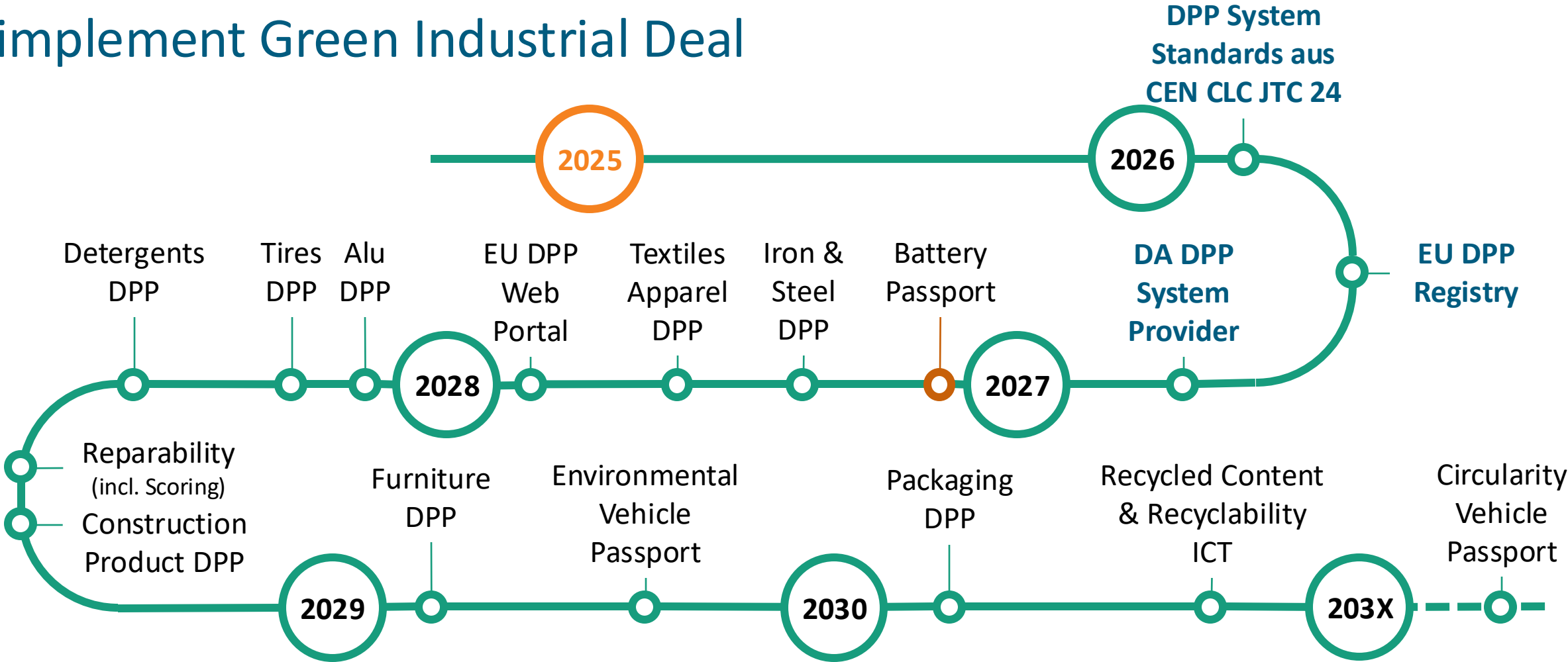


Fraunhofer-Institut für Produktions-
anlagen und Konstruktionstechnik IPK

Input for OS components to design, implement and operate DPP Systems

—
Workshop 29.04.2026

The EU-DPP is a central instrument for supporting ESPR to implement Green Industrial Deal



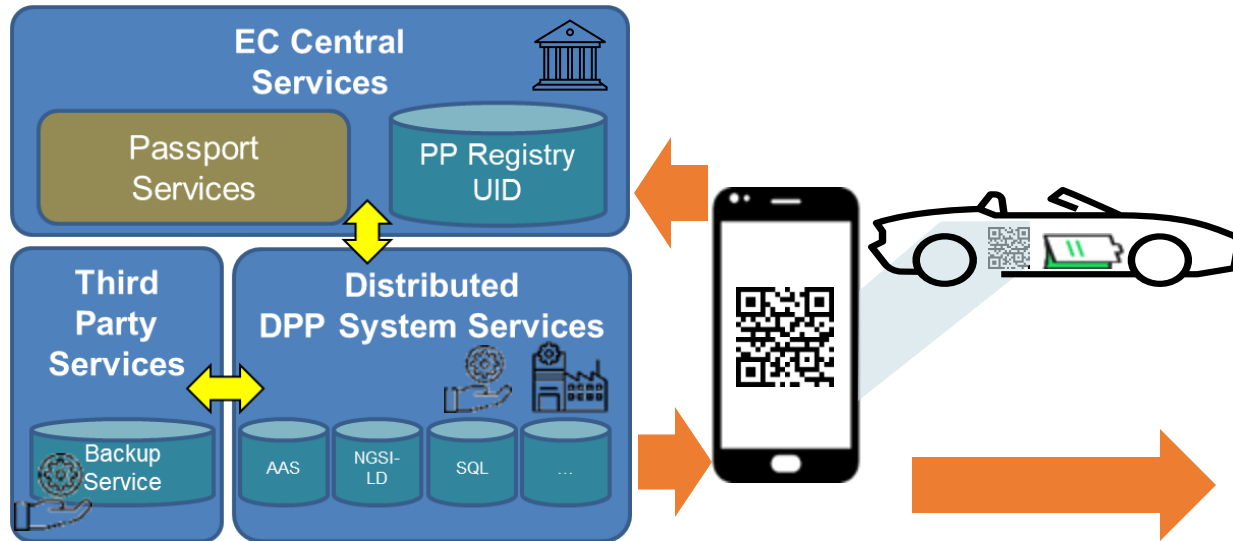
A small theoretical Input – How the EU DPP is working - Example Battery Pass



Customers, Partners and Authorities receive dedicated digital Information from product life



Example Battery Pass



Scope of CEN CLC JTC 24



107 Data Points around the product Life



Selection of mandatory Data



Typical voluntary Data

Battery ID: 0101010

General information

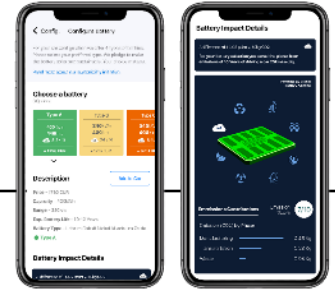
- Manufacturing info (identity, place, date)
- Compliance Labels Certificates
- Circularity
- Supply Chain Due Diligence
- Carbon Footprint
- Manuals
- State of Health**

Battery ID: 0101010

- Benchmarks
- Repair Manual
- Spare Parts
- Connected Products
- Service Centres
- Upgrades

Data are in scope of product group specific standards and delegated acts

System Scope of JTC 24 is to deliver harmonised standards for the DPP System



DPP Data

DPP data sector specific for:

- Batteries
- Electronics
- Textiles
- Construction Materials



→ Defined in different regulations (e.g., the Battery Regulation with further information available in the Battery Passport Content Guidance)

DPP System

Harmonized technical system for all DPPs:



Data Storage



Data Carrier Identifier



Trust / Security / Sovereignty / Access



Data Exchange

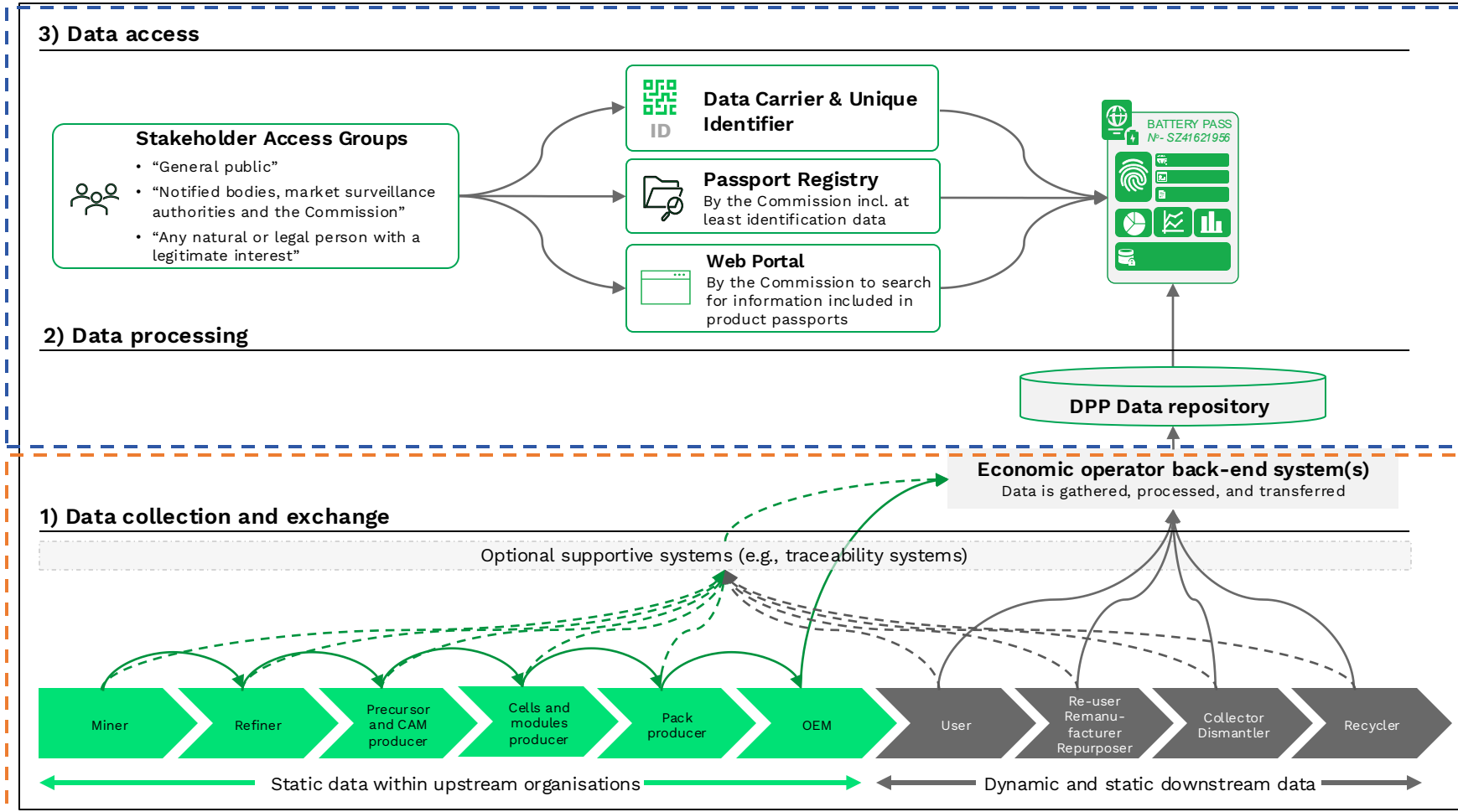


IT Services / APIs



Workflows and Data Processing

Process Scope of JTC24



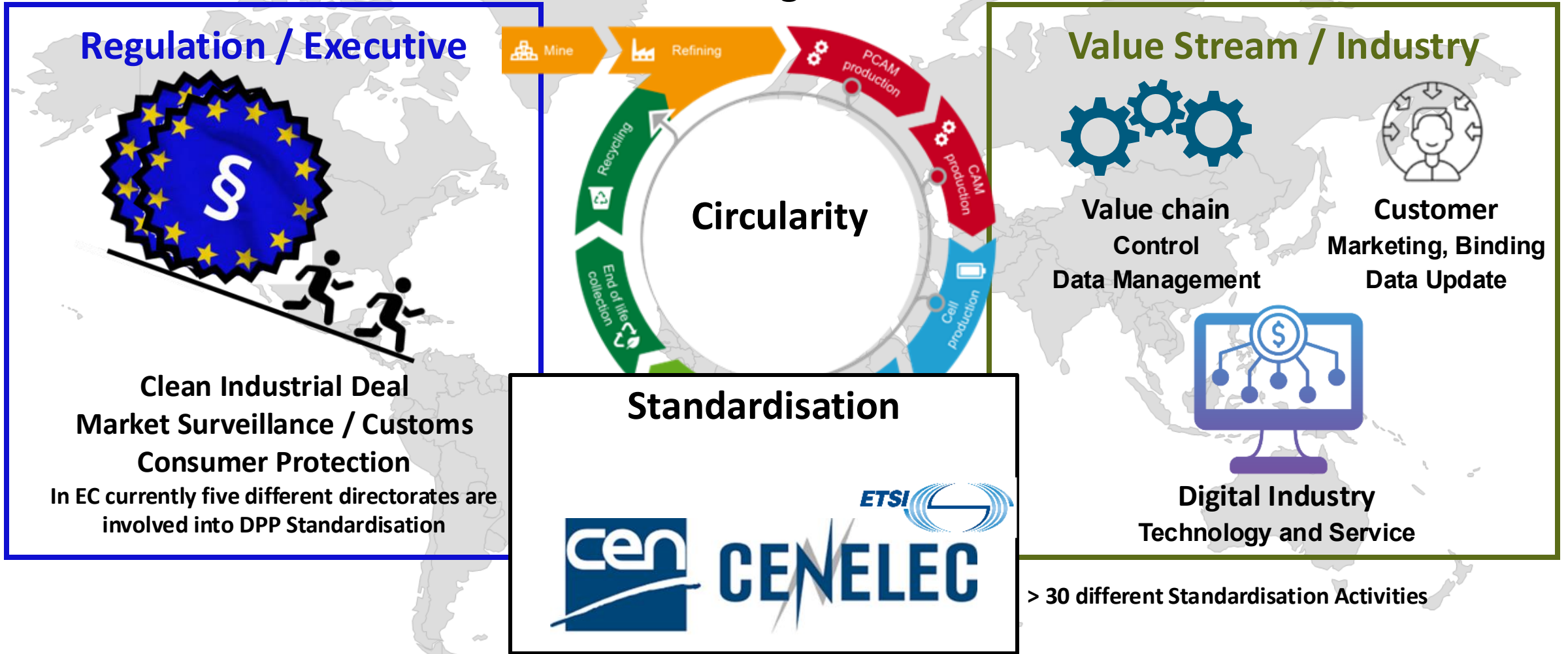
**Scope in JTC 24:
Data Access,
Data Processing**

**In Scope of product group related standards and others, as well as in delegated acts
Data Collection and aggregation**

1) Galatola, M. Digital Product Passport (DPP). Circular Economy Europe. [Online] [Cited: 20 03 2023.] <https://circulareconomy.europa.eu/platform/sites/default/files/michele-galatola-european-commission.pdf>

DPP Orientation – Helicopter View

Global Alignment



Scope of JTC 24 – Technical Standards

Status – April 2026 6 out of 8 Standards passed formal vote



CEN CLC JTC 24 – Delivery Structure and status

Module 2 : Data carriers and links between physical product and digital representation

Module 1 : Unique identifiers

Module 3 : Access rights management, information, system security, and business confidentiality

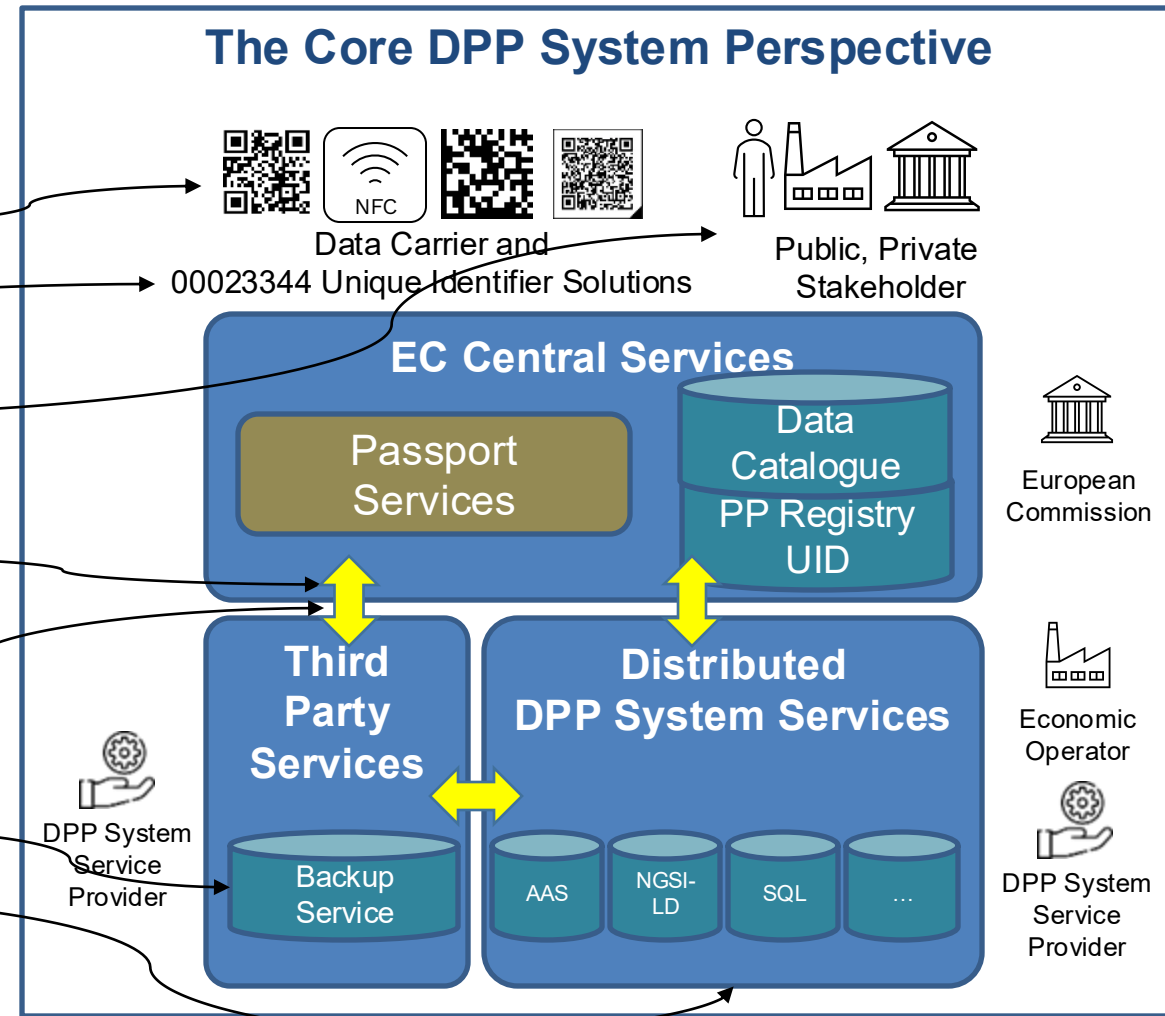
Module 8 : API for the DPP lifecycle management and searchability

Module 5 : Data processing, data exchange protocols and data formats

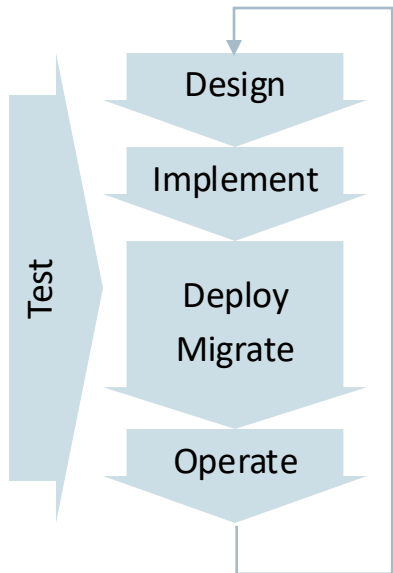
Module 6 : Data storage, archiving, and data persistence

Module 7 : Data authentication, reliability, integrity

Module 4 : Interoperability



Conclusion of possible Major operational Functions were Software can support EU DPP for an OE



Monitoring of DPP Systems Operations					
Upstream Process Data Management <ul style="list-style-type: none"> - Track and Trace - Data Collection and Aggregation - Data Transformation and Mapping - Partner interaction - Partner Services 	Information Flow Management between external and internal Stakeholders				Down Stream Process Data Management <ul style="list-style-type: none"> - Event Handling - Update Data Management - Transformation and Mapping - Partner Interaction - Partner Services
	API to external partner in upstream	API and CRUD operations with Registry	Publishing DPP	API to external Partner in down stream	
Access Rights Management					
Validation and Verification of DPP Data					
DPP Data Analytics					

Functions of internal data management inside EO

DPP – System Governance	DPP Meta Data Management	Operational DPP Data Management
<p>Standards and Regulations Monitoring</p> <p>Business Model Monitoring</p> <p>Impact and Risk Assessment</p> <p>System Implementation Planning, Implementation and Monitoring</p>	<p>DPP Data Modelling operations</p> <p>Semantic Mediation Services</p> <p>DPP Data assignment to Processes, IT Systems and Responsibilities</p> <p>DPP Data Calculation rules</p> <p>DPP Meta Data Monitoring</p>	<p>Collection, Aggregation, Calculation Track and Trace and Provision of:</p> <ul style="list-style-type: none">• Horizontal Data• Engineering Data• Operations Data• (Product, Production Asset)



Federal Ministry
for Economic Affairs
and Energy



Digital Product Passport: Open Source Reference Implementation Workshop

Fish bowl – join the chair!





Federal Ministry
for Economic Affairs
and Energy

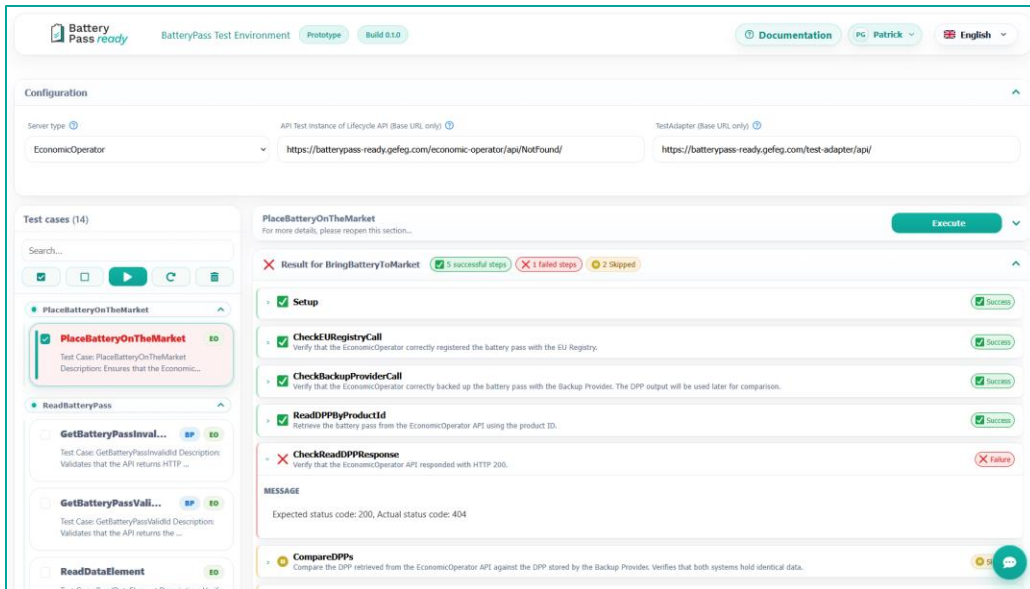


Digital Product Passport: Open Source Reference Implementation Workshop

Lunch over at 1 pm



Battery Pass *ready*



BatteryPass-Ready develops a test environment to help industry and policymakers prepare for the EU battery passport. Building on the Battery Pass project, it supports companies in assessing the conformity of their battery passport solutions, ensuring data quality, and fostering a more sustainable battery value chain.

Motivation:

Ensure compliance

The Digital Product Passport requires transparent and verifiable data exchange between all actors.

Support interoperability

Different system types (Economic Operators, Registries, Backup Providers) must interact reliably.

Enable early testing

A dedicated test environment allows early validation before large-scale implementation.



Purpose & problem addressed:

- High complexity of overall environment
- Tight time frame
- Dynamic ecosystem and moving targets

Existing use cases:

- Users cannot verify whether their DPP system correctly handles the required interactions (registration, read, backup) with other actors.
- They have no neutral way to check whether their battery passports meet the expected data structure and conformity rules.

Core functionality & key components :

- API-Testing to ensure interoperability
- Passport schema file validation and plausibility rules
- Configurable Access Rights Management Testing
- Emulated Registry

Vertical/industry & target groups:

Economic Operators, DPP Service Providers

Covered DPP components (e.g. data model, backend, interfaces):

Data models, interfaces

Development stage (concept, prototype, production-ready):

The test environment is currently in pilot stage, with around 100 supporting partners actively using and testing it to provide feedback for further development.



cdmm ONEPDM DPP Open Source Implementation



cdmm ONEPDM "DPP Data + DPP System"
Digital SI-vereinheitlicht semantifizierte Product Passport Architecture

© cdmm GmbH Jena, Michael Hofmann

cdmm
common data management

docker

Units
Definition
SI
mol, kg, m, s, A, K, °C, h, g, N, m³, J, Pa, W, V, Ω, F, C, T, K, A, S, SI

2-Säulen-Hebebühne SPMA32-XP

Technische Spezifikationen

Eigenschaft	Wert	Einheit
Anzahl der Säulen	2	
Drehtellerhöhe min.	96	mm
Drehtellerhöhe max.	130	mm
Antriebsart	elektromechanisch	
Säulenabstand	2600 - 2700	mm
Säulenweite außen	3123 - 3223	mm
Säulenhöhe	2920	mm
Durchfahrbreite	2372 - 2472	mm
Erforderliche Deckenhöhe	4150	mm
Oberflächenbeschichtung	Pulverbeschichtet	
Tragarm-Ausführung	asymmetrisch	
Teleskopierbarkeit Tragarme vorn	3 -fach	
Steuerung	elektrisch	
Teleskopierbarkeit Tragarme hinten	2 -fach	
Tragarmlänge vorne min.	555	mm
Tragarmlänge vorne max.	1100	mm
Tragarmlänge hinten min.	805	mm
Tragarmlänge hinten max.	1200	mm
Antriebsleistung	2 x 2,6	kW
Einbauart	bodeneben	
Elektrischer Anschluss	400 V 50 Hz	
Breite	3250 - 3350	mm
Höhe	4052	mm
Tragfähigkeit	3200	kg
Hubhöhe max.	2000	mm
Hubzeit	42	s

PRODUKTKENNEICHUNGEN
Produkt SPMA32-XP
Hersteller VSO EMEA - RAV/ROT
GTIN 4057612898637
MPN ROT_SP32X.198723

DOKUMENTE Dokumente anzeigen

Example: dpp.wunschloesung.com

Short description:

- “Every product will have its own website!”
- MLP (Minimum Lovable Product) of **fully scalable Showcase-Implementation** (UHP Ultra High Performance DPP via API)
- **Ready to integrate** with real unified product data sources
- Developed by an **interdisciplinary consortium with end-to-end expertise** (regulation, metrification, standardization, integration & innovation?)
- **API & User-centred design**, containerized platform technology, open marketing & sales
- Benefit from **DPP cross-industries best practices** (OE & IAM)
- **DPP as a springboard**, rather than only meeting regulatory requirements (New customer Touchpoint incl. potential for **up- and cross-selling products as well as extended services**)
- **Focus on core business technologies, real scalable Digital SI semantified “DPP Data + DPP System” architectures**, instead of developing an own solution without [Nature Constants](#)
- **DPP OS Preview:** [cdmm ONEPDM Open Source Architecture](#)
- **DPP Example: DI Data Identifier Product.gtin ?.8P**
<https://dpp.wunschloesung.com/product/onepdm/?8P=4057612898637>
- **Contact:** Michael Hofmann | cdmm GmbH | JENA | Thuringia
<https://www.linkedin.com/in/michael-hofmann-cdmm>
- **for more information**, please visit the [full cdmm slide deck](#)



#ONEPDM | ONEDPP Open Source Implementation

Vertical/industry & target groups:

- **for all Industries**, for all Sectors, for all Languages
- **for all Products** (ISO IEC 15459 Digital Object Link ready)
- **for all ProductGroups** (ESPR Annex III & “Attribute Longlist” ready)

Core functionality & key components :

- **SI System Core** inside (The New BIPM SI System of Units)
- **Multi Vocabulary** Concept inside (IEC CDD, ECLASS, GS1, UNTP, etc.)
- **Unified Semantics** Concept inside (EDI, EDIFACT, IDTA, OPC-UA etc.)

License models:

- **End User** Model (Saas, in Development, Call to Action ;-)
- **Sales Partner** Model (in Development, Call to Action ;-)
- **Technology & Investment Partner** Model (Call to Action ;-)

Existing use cases:

- **Manufacturer** Product Catalogues, Pricelists, Spare Parts Systems
- **Retailer** Product Catalogues, Pricelists, Spare Parts Systems
- **Service Partner**, Spare Parts, R&M Repair & Maintenance Systems

Purpose & problem addressed:

- No.1 “DPP Data + DPP System” concept with New SI System (2019) inside
- No.1 Vocabulary concept inside – Digital SI, Schema.org, IEC CDD, etc.
- No.1 Long-life DPP Product Data Model
- Cross-sectors ISO IEC 15459 DI Data Identifier inside (GS1 & ANSI MH10)
- Long-life interoperability & updateability concept inside

Covered DPP components (e.g. data model, backend, interfaces):

- **ONEPDM** DPP Product Data Model (Properties|Values|Units)
- Keycloak Access Control (LDAP, OIDC, OAuth2.0, SSO)
- Django Web API Core (Python, CRUD)
- GUNICORN Web Server (fast, minimal, https)
- Primary + Secondary Postgres Databases / Redis Cache
- XML, JSON, JSON-LD serialization inside (ISO IEC 15459 ready)

Development stage (concept, prototype, production-ready):

- **Backend** Django Web API, ready
- **PDM** Product Data Model, ready
- **DPP** Data Model, in development (EU Commission, Deleg. Acts, Registry)
- **DPP** unified Frontend, in development

Pilots:

DPP transformation in Progress – Example: [Ravaglioli](#)
 DPP transformation in Progress – Example: [Rotary](#)
 XML <https://dpp.onepdm.com/v1/product/?mpn=ROT.SP35X.199263&format=xml>
 JSON <https://dpp.onepdm.com/v1/product/?mpn=ROT.SP35X.199263&format=json>
 JSON-LD, in development

#My DPP Open Source Implementation



Short description:

- Chemical products (synonym for substances, materials, chemicals) are present everywhere in our surroundings and are part of 95% of all products. But the way we exchange product information is yet outdated, as it is document-centric. Chem-X strives to initiate the transformation of the industry by defining a semantic description of chemical products, focusing on product stewardship, ensuring the right to sell (compliance) and sustainability and circular economy, the right to win. Chem-X also wants to demonstrate data exchange via Catena-X-based dataspace technology using Cofinity-X solutions.
- Chem-X introduces the concept of a digital material passport (DMP) that shall become the data container of choice to communicate chemical products' data and certificates. Unlike the DPP, it is not regulatory-required, is not registered with the DPP Registry, and targets machine-to-machine communication between business partners and/or notified bodies.

#My DPP Open Source Implementation

Vertical/industry & target groups:

Chemicals industry (construction, basis, petro, performance, specialties), and adjacent industries such as FMCG, construction, textile, automotive, aerospace and

Core functionality & key components :

Catena-X architecture made available through Cofinity-X Sandbox:

- BPM
- EDC
- Digital Twin Registry
- DID:web

License models:

Tbd (assumption that it will be Fair, Reasonable, and Non-Discriminatory (FRAND)). We are currently in TRL 3 / 4

Existing use cases:

- Chemical Product Information exchange over 2 – 3 value chain participants using Cofinity OS
- ITC (interoperability Test Case) DMP comprising a nameplate, composition and classification, sustainability and circularity attributes as JSON and SAMM

Purpose & problem addressed:

- Facilitatee, best case automate chemical product information exchange
- Define MVP terms and definitions to represent chemical products
 - Define MVP methods and definitions of sustainability (cradle to gate) and circularity metrics for chemical products
 - Propose Draft semantics for standardisation in IEC CDD, ISO TC 207

Covered DPP components (e.g. data model, backend, interfaces):

- Information Model
- Data Model
- Cofinity-X Backend

Development stage (concept, prototype, production-ready):

- PoC

Pilots:

- HMI Demonstrators ([Regular Paint](#), [Sustainable Paint](#), [Adhesives for automotive](#), [Sustainable Wiring](#), [Cross Data Ecosystem](#), [Industry Loop](#))

Chem-X

Overview Material Declaration Hazard Statements PCF Water Scarcity Circularity Sustainability

Digital Twin Id urn:uuid:123e4567-e89b-12d3-a456-426614174000	Catena X Id BPNL000000000UKM
Company Name Merck KGaA	Granularity Model
Manufacturer Part Id 1845104000	Product Name At Manufacturer AZ.P4110.PHOTORESIST-W.302-0004
Gtin	

09:23 5G

IC Multi-element standard I
1.70398 Lot: SAMPLE

CoA Shop

General Information

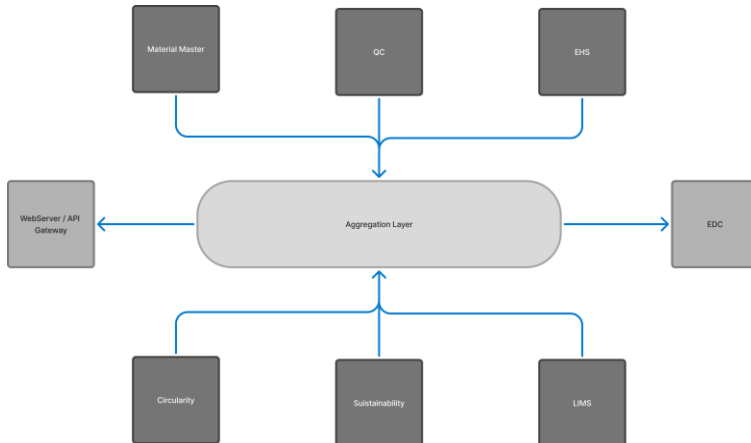
Material# 1703980500
GTIN 4022536714134

Product Attributes

Application
F = 100 mg/l, Cl = 250 mg/l, NO₃, SO₄²⁻ = 500 mg/l, PO₄³⁻ = 1000 mg/l in H₂O Certipur®

Safety Data
No Preventive, Response or Hazard Statements known. Please check the SDS

Save



Short description:

- Chem-X ITC DMP
 - Digital Material Passport used for Hannover Fair
 - DMP Model will be enhanced for Chem-X MVP
 - based on
 - EDC
 - Basyx AAS
 - DID:WEB
- Chemisphere
 - App based approach
 - using Datamatrix Code
 - planned ERP and LIMS integration
- Outlook
 - Data lake / Data Warehouse as central data aggregation layer
 - EDC for B2B
 - Web Server / API Gateway for DPP

#My DPP Open Source Implementation

Vertical/industry & target groups:
Chemicals / Life Science / Electronics

Core functionality & key components :
Data aggregation and presentation

License models:
Chemisphere → closed source
Chem-X → Open Source
Merck DPP Solution → Internal

Existing use cases:
Chem-X DMP
Life Science Portfolio

Purpose & problem addressed:
Chemisphere → Ease of data access
→ system integration

Covered DPP components (e.g. data model, backend, interfaces):
Data model for Chemicals → Chem-X

Development stage (concept, prototype, production-ready):
Chemisphere (Product)
Chem-X (Demonstrator)
Merck DPP Solution (Concept)

Pilots:
Chemisphere itself
Hannover fair demonstrator

#My DPP Open Source Implementation

Short description:

Digital Data Chain Consortium and ZVEI will provide an electronics products pilot based on open source software, with focus on SME.

We will provide open source software to create a globally unique identifiers conform to EN 18219.

We will provide an open source AAS based tool to create conform EU DPPs.



DPP Pilot 3 for electronics products

#My DPP Open Source Implementation

Vertical/industry & target groups:
Cross industry

Core functionality & key components :
Unique identifier creation, DPP creation AAS based.

License models:
Open source

Existing use cases:
DPP in the B2B sector

Purpose & problem addressed:
Specifically for SMEs

Covered DPP components (e.g. data model, backend, interfaces):
Complete DPP system except DBB backup

Development stage (concept, prototype, production-ready):
First release Q3 2026

Pilots:
Electronic products

#dpp-keystone.org

A reference implementation/proof of concept of a web-native digital product passport toolkit and implementation. Completely creative-commons, not exclusive.

Short description:

DPP Keystone arose as an idea, during discussions about what kind of standards might be pragmatic in the context of DPPs.

Some of the concepts were initially developed in a much simplified form, simply to explain ideas in different working groups.

Ultimately, the idea took on a bit of a life of its own.

dpp-keystone

Vertical/industry & target groups:

All, but in order of predicted ESPR priorities

Core functionality & key components :

A website that publishes a structure of mapping schemas to ontologies that are specifically targeting ESPR relevant terms. There are example adapters to HTML, schema.org and gs1.org to serve as an inspiration for other adapters including IRDI style dictionary systems.

License models:

Creative Commons

Existing use cases:

We provide a dpp validation tool and creation wizard. For some initial sectors (Battery, construction - particularly DOPC and EPC) these tools are quite advanced. Allowing companies to understand what data points they already have access to and what they might be missing.

Purpose & problem addressed:

Focus on adaptation to existing dictionaries and systems in the wild, to make DPP as frictionless as possible, regardless of the nature of the existing IT system.

Covered DPP components (e.g. data model, backend, interfaces):

Schema and data model and general adapter code and equivalency descriptions. No back end or API, though we may at some point publish something like an inspirational OpenAPI spec.

Development stage (concept, prototype, production-ready):

Prototype, with some ontologies being used to develop example DPPs by industry participants.

Pilots:

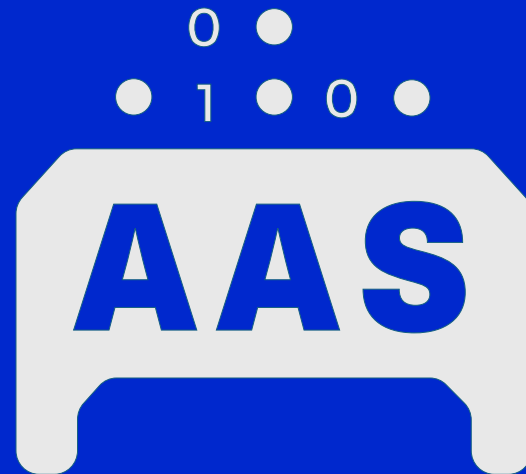
Pilots are in the area of companies building example DPPs and exploring data availability. Not in the area of software implementation.

Industrial Digital Twin Association

Home of the AAS

The Vision

Asset Administration Shell



Worldwide Standard for
the Industrial Digital Twin

IDTA Liaisonships with SDO



JTC 24 „Digital Product Passport“



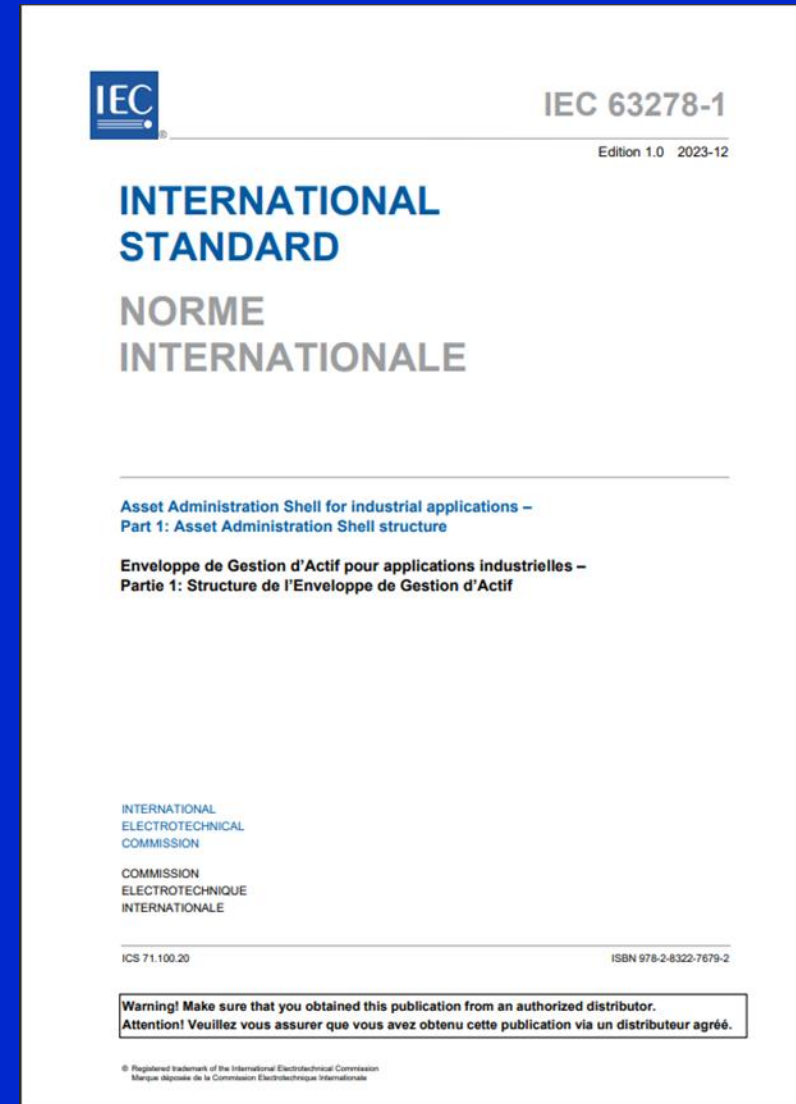
TC65/WG24 „Asset Administration Shell for Industrial Applications“



SC41/WG6 „Digital Twin“



AAS und Digital Product Passport



MEMBERS: SUPPLIERS – USERS | OT – IT

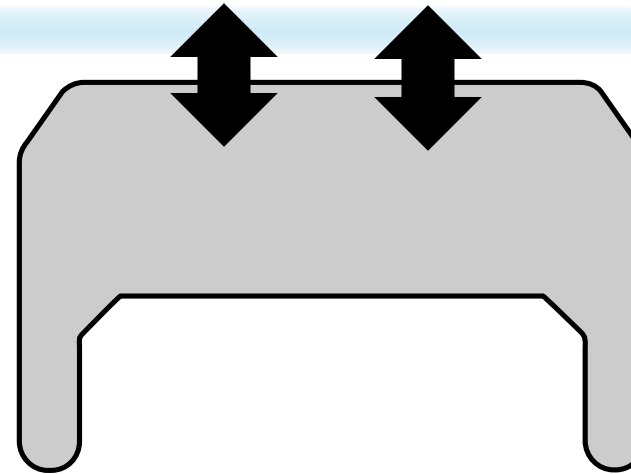


127 Members from 22 Nations

IDTA conducts two Standardisation Tracks

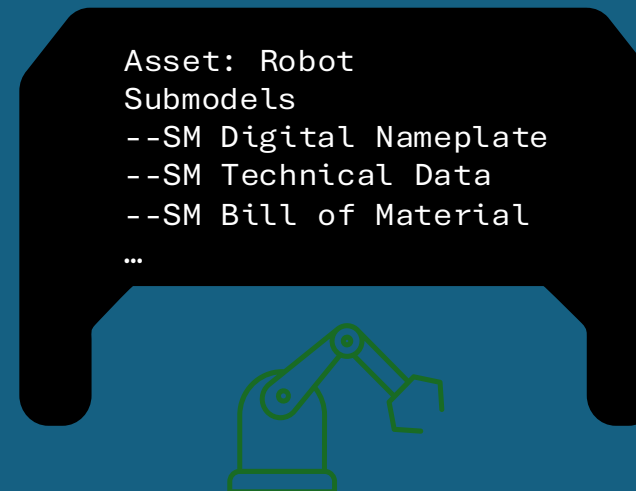
1. Technology: AAS Specification

1. Metamodel
2. API (Interface)
3. Data Specification
4. Security
5. Package File




2. Semantics: Submodels

- 100+ Standardised information models




Eclipse BaSyx

Digital Product Passport




Rohling_0001

DPP ID
<http://tec-mdb.ptw/ids/asset/0001>



General
Carbon Footprint

General Product Passport Information Digital Nameplate v3.0

Property	Value
URIOfTheProduct	https://www.eclipse-dipp.de/dpp-demo/rohling
OrderCodeOfManufacturer	X001
SerialNumber	RohlingSteuerscheibe001
DateOfManufacture	2025-10-02
CountryOfOrigin	DE
UniqueFacilityIdentifier	Fraunhofer_IESE_DTE
ManufacturerName	Fraunhofer IESE
ManufacturerProductDesignation	Rohling Steuerscheibe
CompanyLogo	
Address	Fraunhofer-Platz 1, 67663 Kaiserslautern, Germany

Eclipse BaSyx – Open-Source Middleware for Digital Twins and the Digital Product Pass

- Open-source implementation of the **Asset Administration Shell (AAS)** as defined by IDTA
- Provides **standard-compliant infrastructure** for AAS **metamodel, APIs and security**
- Enables realization of the **Digital Product Pass (DPP)** as a **structured view on digital twins**
- Modular architecture for **integration of heterogeneous data sources** (ERP, production, sustainability, etc.)
- Supports **interoperable data exchange, lifecycle management and access control**
- Includes **backend services, SDKs and extensible web UI** (editing, visualization, DPP apps)
- **Very High TRL:** Designed for **scalability, extensibility and cross-industry applicability**
- Actively aligned with **AAS specification and ongoing DPP standardization (API, metamodel, security)**

Eclipse BaSyx

Vertical/industry & target groups:

- Cross-industry: e.g. manufacturing, automotive, pharma, civil engineering
- Target groups: developers, system architects, platform operators

Core functionality & key components :

- AAS infrastructure: **Registry, Repository, Discovery, Submodel handling**
- Standardized **APIs, metamodel and security (incl. role-/attribute-based access control) conforming to IDTA**
- **Extensible UI & modular plugin system** (e.g. DPP applications, editors, visualization)

License models:

- **MIT License (permissive, business-friendly)**
- No vendor lock-in, suitable for **industrial and commercial use**

Existing use cases:

- Digital Product Pass & Product Carbon Footprint
- Manufacturing monitoring, OEE, asset integration
- Digital Twin infrastructures in **dataspaces (Catena-X, Factory-X, Manufacturing-X)**

Purpose & problem addressed:

- Provides **ready-to-use infrastructure for AAS-based digital twins**
- Enables **standard-compliant DPP implementation without building new systems**
- Addresses integration of **distributed data sources, lifecycle data and access control**

Covered DPP components (e.g. data model, backend, interfaces):

- **Data model:** AAS metamodel + DPP extensions
- **Backend:** repositories, registries, persistence
- **Interfaces:** standardized APIs (aligned with DPP annex work)
- **UI:** visualization, editing, QR-code-based access

Development stage (concept, prototype, production-ready):

- Overall ecosystem: **production-ready**
- DPP extensions: **finalization aligned with IDTA + DPP annexes**
- UI: **production-ready DPP demonstrator (editing, access control, visualization)**

Pilots:

- Productive DPP implementation at **Harting**
- PCF demonstrator at **Roche**
- DPP demonstrator with **TU Darmstadt**
- Participation in **Factory-X / Catena-X / Manufacturing-X**

#My DPP Open Source Implementation



Global Project Quality Infrastructure

Partner countries: Indonesia, Mexico, Brasil, China, India

Goals:

- Reduce Technical Barriers to Trade
- Enhance Product Safety
- Strengthen Consumer Protection

DPP:

- Improve knowledge and Raise awareness of the importance of DPP
- Promote Interoperability
- Strengthening cooperation and a joint approach



Your Digital Solutions Partner
Innovapps

Innovapps GmbH, Wiesbaden

Web Applications, AI & eCommerce

Microsoft Partner

Our suggestions

(decision reflects lessons learned from active customer projects):

- Responsive web application focusing on mobile
- Built on Vue.js (Frontend) & Asp.Net Core (Backend)
- Easy customer adoption w/o IT knowledge: Deploy via Azure Marketplace („Azure app store“)
- single-tenant: One customer, one SW-instance
- enterprise-grade security powered by Azure Entra ID & granular RBAC

Short description:

Frontend: Responsive Web App (Vue.JS) - mobile-first, runs on any device, no installation required

Backend: .NET / ASP.NET Core → optimized for Azure Web Apps, widely adopted in DACH enterprise environments

Identity: Azure Entra ID (SSO) + other Business SSO providers (i.e. Google)

Security: granular RBAC on object and field level, read/write different rights

Data layer: Azure SQL / Cosmos DB + Azure AI Search for semantic DPP queries

API: RESTful + OpenAPI Spec, standards-compliant with IEC 63278 / IDTA AAS

License: e.g. Apache 2.0 (Eclipse Foundation compliant)

Plugin-Marketplace: Enhance solution by Plugins

Single-Tenant: will guarantee our Partners will also benefit from the Open Source

Vertical/industry & target groups:

German “Mittelstand”

Target groups: product compliance managers, sustainability officers, ERP/PLM integrators & software architects implementing ESPR and DPP requirements

Core functionality & key components :

Responsive web app, mobile-first UI with touch-optimized interactions. Single-tenant deployment model — each organization runs its own instance, ensuring data sovereignty by design. Granular RBAC on object and field level via Azure Entra ID (SSO). DPP registration, versioning, validation, and audit logging. RESTful API with OpenAPI specification for southbound ERP/PLM integration.

License models:

e.g. Apache 2.0

Existing use cases:

- DPP in Quality Infrastructure
- Asset Administration Shell

Purpose & problem addressed:

User Experience

Due to the mass of data many example implementations are focused on information, not on experience

Deep knowledge of SW-Development and DPP are currently required. Providing a DPP for your (non-technical) product should only require Product knowledge

Covered DPP components (e.g. data model, backend, interfaces):

Data model, backend services (.NET / ASP.NET Core), REST API layer, identity & access management, frontend UI, Azure deployment

Plugin Marketplace to connect to external systems, i.e. Interfaces of ERP, PIM, Identity-Providers, etc. improve adoption of our solution

Development stage (concept, prototype, production-ready):

Concept with proven components — two active customer implementations provide production-validated building blocks

Pilots:

- "Digital Productpass in Quality Infrastructure“
- Standards-first implementation of "Asset-Administrations Shell (AAS) / Verwaltungsschale,, (fully fledged web app with login, roles, various data types. Very strong focus on full compliance with current IDTA submodel templates and specification.

Spherity GmbH

DPP Open Source Implementation

<https://dpp.vocabulary.spherity.com/dbp/v0.2/batteryPass.html>

Short description:

spherity/dpp-vocabulary is a documentation and schema repository for **Digital Product Passport** vocabularies, focused on JSON-LD definitions for multiple DPP types and the high-level concept flows around them. From an IT architecture perspective, it provides the semantic layer of a DPP solution: it standardizes product data structures so downstream systems can exchange, validate, and verify DPP information consistently.

The repository appears to sit at the **data modeling and interoperability** layer of a DPP stack. In practice, that means it helps define the canonical vocabulary that other components can use for issuer systems, DPP viewers, verifiers, APIs, and potentially wallet-based or DID-based trust flows. This kind of artifact is essential when multiple stakeholders need a shared machine-readable representation of product data across the supply chain.

in-scope:

- JSON-LD schemas for different DPP object types.
- Vocabulary terms and semantic definitions for product-related attributes.
- Conceptual flow documentation showing how DPP data is created, exchanged, and consumed.
- **standards and reference-model repository** that supports implementation work in surrounding platforms and integrations.

out-of-scope:

- full application or service

Spherity GmbH - DPP Open Source Implementation

Vertical/industry & target groups:

Vertical/industry:

- **Priority Sectors:** Textile, footwear, and mattresses, Battery and automotive, and Electronics.
- **Other Industries under ESPR:** Tyres, Iron and steel, Furniture, Aluminium, Paints, Lubricants and chemicals, Energy related products, and ICT products.
- **Spherity Core Industries:** Life Sciences, Financial Services, Automotive, Manufacturing, and Energy.

Target groups (Ideal Customer Profile):

- Brand owners (first party) or third parties.†
- Mid to large manufacturers who are export-oriented.†
- Companies with complex supply chains and strong compliance pressure

Core functionality & key components :

- **DPP Life Cycle Management:** Creation, registration, and continuous updating of Digital Product Passports via the VERA Studio (Manufacturer Portal).
- **Digital Identity & Verifiability:** Issuance of the DPP as a Signed W3C Verifiable Credential using Decentralized Identifiers (DIDs).
- **Access Control:** Role-based and identity-based access management, along with selective disclosure features on the DPP End-User Frontend.
- **Ecosystem Integration:** Seamless API integration with existing systems (ERP/MES/PLM) via an API Gateway. The DPP acts as an entry point to a network of data and services.
- **Deployment Flexibility:** Solutions are deployable as cloud-hosted SaaS, on-premises, or in a hybrid model.

Purpose & problem addressed:

- **Regulatory Compliance and Risk:** VERA DPPs help meet the increasing regulatory requirements for supply chain information across all product categories and minimize the risk of penalties, fines, and legal issues that result from non-compliance.
- **Trust and Data Control:** They build consumer trust in a time of greenwashing and deceptive claims by incorporating verifiable data and access management controls to help maintain control of your data.

Covered DPP components (e.g. data model, backend, interfaces):

Data Model/Schema: Support for standardized templates (e.g., Battery Pass, EU CIRPASS) and custom templates. The architecture is modular and schema-driven, defining data via Profiles and Templates.
Semantic interoperability via published ontology applied to our linked data:

- <https://dpp.vocabulary.spherity.com/dbp/v0.2/batteryPass.html>

Spherity GmbH - DPP Open Source Implementation

License models:

- not fix yet (MIT)

Development stage (concept, prototype, production-ready):

- prototype

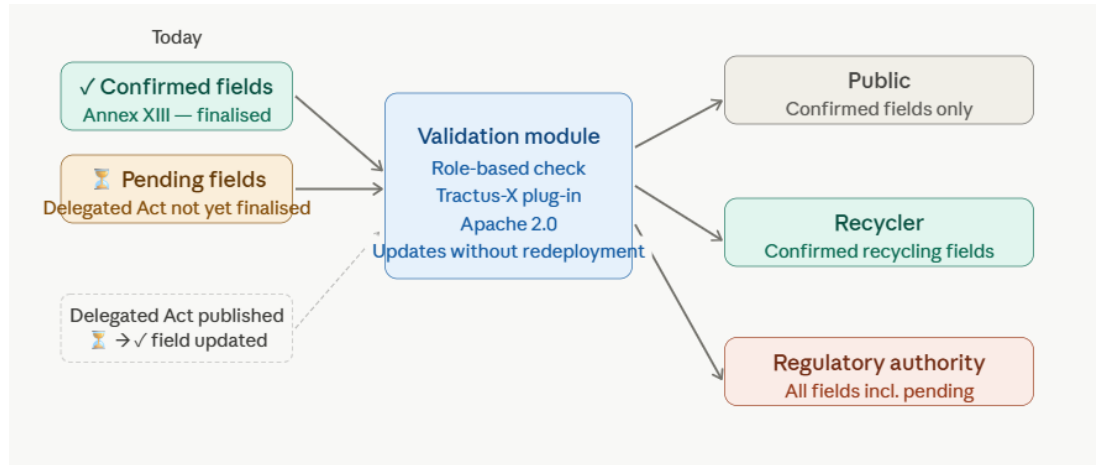
Existing use cases:

- DPP data modelling for BatteryPass (currently)

Pilots:

- none

#My DPP Open Source Implementation



(Concept) Proposal: DPP field versioning module — handling pending Delegated Acts in Eclipse Tractus-X

Battery Passport OSS needs a mechanism to handle DPP fields where Delegated Acts are not yet finalised — manufacturers cannot lock in what to disclose, to whom, at what level.

- This project proposes a plug-in module for Eclipse Tractus-X: per-field regulatory status tagging (confirmed vs. pending) and role-based validation — so the OSS stays compliant as EU rules evolve, without full redeployment.*

My DPP Open Source Implementation

DPP field versioning module – handling pending Delegated Acts in Eclipse Tractus-X

<p>Vertical/industry & target groups:</p> <p>VERTICAL / INDUSTRY: Automotive / EV, Energy storage, Industrial & LMT batteries TARGET GROUPS: Battery manufacturers, OSS developers, Recyclers, Regulatory authorities</p>	<p>Purpose & problem addressed:</p> <p>Delegated Acts on recycling data disclosure are not yet finalised — manufacturers cannot lock in what to disclose, to whom.</p> <p>No OSS mechanism exists to update DPP validation and disclosure rules as Delegated Acts are published.</p>
<p>Core functionality & key components :</p> <ul style="list-style-type: none"> Per-field regulatory status tagging — confirmed vs. pending Delegated Act Role-based validation — public / recycler / authority disclosure completeness check 	<p>Covered DPP components (e.g. data model, backend, interfaces):</p> <p>Data model, Validation, Versioning</p> <p>AAS submodels: material composition, recycled content, end-of-life — versioned per Delegated Act status.</p>
<p>License models:</p> <p>Apache 2.0</p> <p>Proposed plug-in to Eclipse Tractus-X AAS & EDC stack.</p>	<p>Development stage (concept, prototype, production-ready):</p> <p>Concept</p> <p>Design proposal — seeking OSS developer partners in Eclipse Tractus-X.</p>
<p>Existing use cases:</p> <p>Battery manufacturers preparing DPP recycling data today — no OSS tooling exists to manage pending vs. confirmed disclosure requirements.</p>	<p>Pilots:</p> <p>Co-develop with Eclipse Tractus-X community — validate against real Delegated Act publication cycle.</p>

#My DPP Open Source Implementation



Short description:

Global e-waste is rapidly increasing, yet repair and recycling often fail at scale because critical product data is missing - creating an urgent need for solutions that extend electronics lifetime and enable reuse.

CEleRA develops an open-source reference implementation for a hardware-based Digital Product Passport (DPP) for industrial electronics. The DPP stores machine-readable lifecycle, repair and recycling data directly on the PCB and is designed to be interoperable via AAS (IEC 63278-1) and OPC UA, with secure chip/NFC interfaces.

Planned pilots and field validation within the CEleRA demonstrators:

- (1) industrial crane control electronics (DEMAG)
- (2) a repairable/recyclable BMS concept (NXP)
- (3) An automated repair test line will validate DPP-enabled repair workflows - read DPP data, remove, rework, reassemble (Brand KG)

#My DPP Open Source Implementation

Vertical/industry & target groups:

Industrial electronics. Target groups: OEMs and EMS providers, service/maintenance organizations, repair providers, and recyclers. Pilots focus on crane control electronics and battery management system electronics.

Core functionality & key components :

- Hardware-based DPP tag embedded on the PCB
- Unique product identity + secure authentication
- Interoperability layer: mapping to AAS and exposure via OPC UA

License models:

Open Source (freely available software). CELeRA aims to provide the DPP-related software components (incl. libraries) as open-source source code; commercial IP may still apply for specific hardware/chip components.

Existing use cases:

- Use Case 1: Repairable, modular crane control electronics with DPP + digital twin (Demag).
- Use Case 2: Design concept for repairable & recyclable BMS electronics including DPP integration (NXP).

Purpose & problem addressed:

Industrial electronics repair and recycling are often uneconomical because key information (composition, materials/substances, repair data) is missing, non-standardized, or not machine-readable. With upcoming regulatory pressure (e.g., “Right to Repair”), industry needs trustworthy, interoperable product data across the lifecycle.

Covered DPP components (e.g. data model, backend, interfaces):

- Hardware interface to the DPP tag
- Data model for lifecycle-relevant information (repair, recycling)
- Interoperability via Asset Administration Shell and OPC UA

Development stage (concept, prototype, production-ready):

- Concept phase (project started Feb 2026).

Pilots:

Planned pilots and field validation within the CELeRA demonstrators: (1) industrial crane control electronics and (2) a repairable/recyclable BMS electronics concept. A planned automated repair test line will validate DPP-enabled repair workflows (read DPP data, desolder/remove, rework, reassemble/solder).

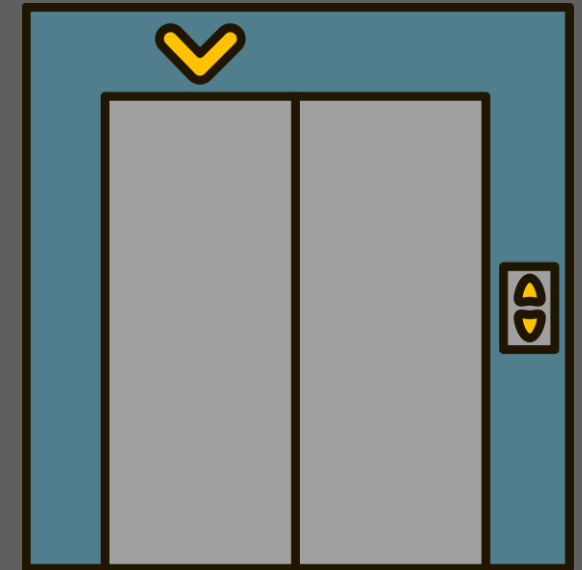


Federal Ministry
for Economic Affairs
and Energy



Breakout Session #1
Room 080

Breakout Session #2
Room 081



GROUND FLOOR



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Digital Product Passport: Open Source Reference Implementation Workshop

Thank you for joining!

