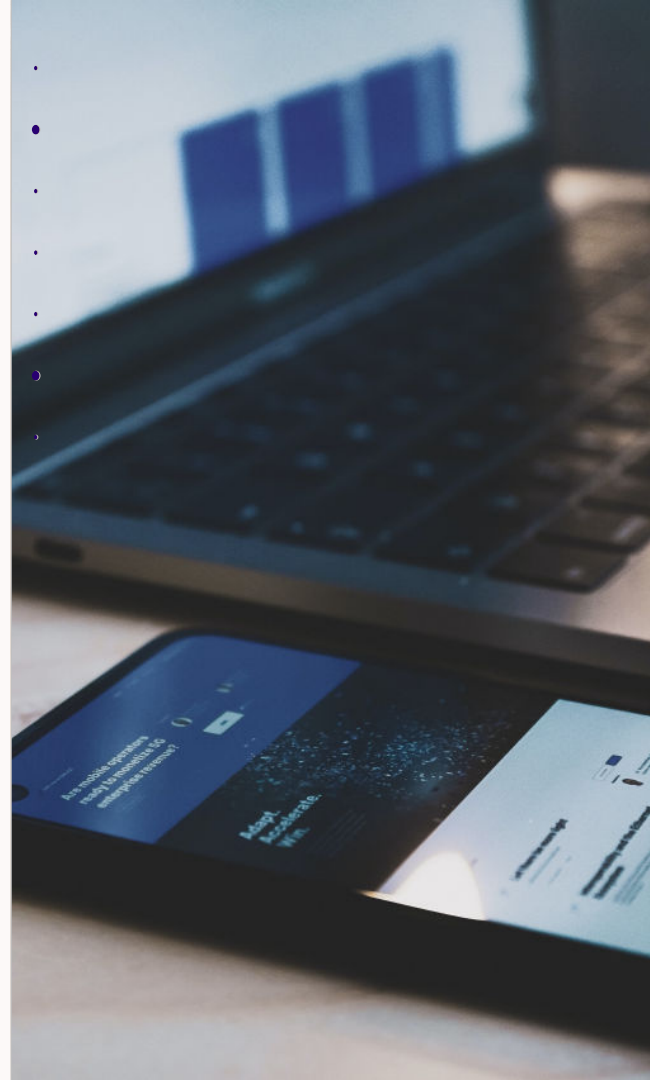
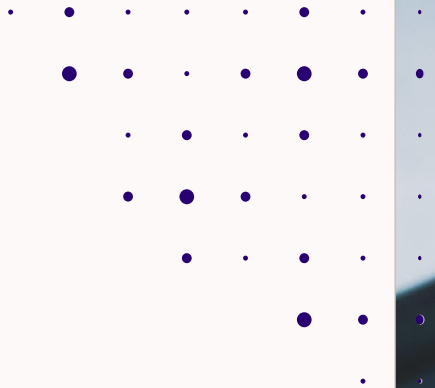


Digital Product Passport

From identification of the relevant data to implementation and integration of the required technologies

2024



We are developers of digital futures

Tietoevry Create

Global digital engineering business

Tietoevry Banking

Financial services software business with global reach

Tietoevry Care

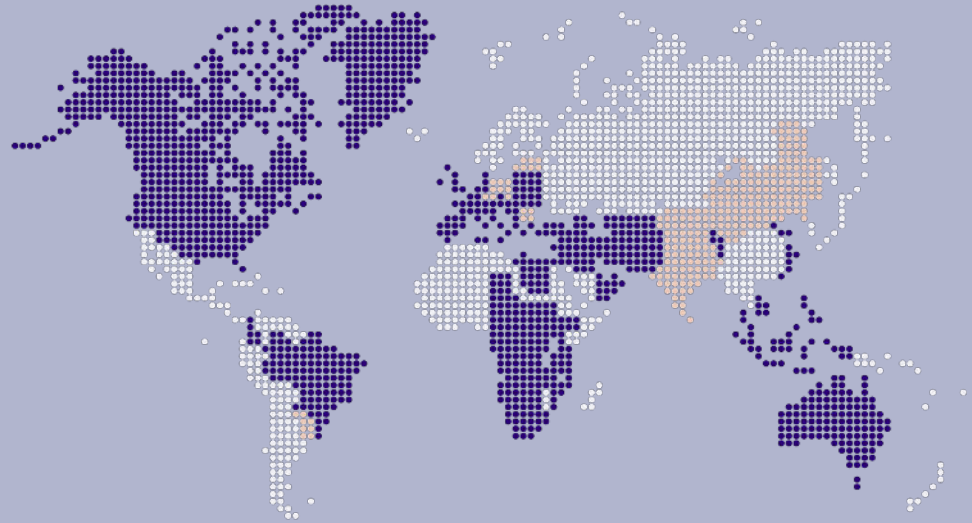
Nordic healthcare and social care software

Tietoevry Industry

Portfolio of niche software and data platforms

Tietoevry Tech Services

IT modernization for Nordic societies and businesses



Over **24 000** professionals globally

More than **10 000** customers

Serving customers in over **90** countries worldwide

Annual revenue approximately **EUR 3 billion**



What drives us:

Create purposeful technology that reinvents the world for good



Our values:

Openness, trust and diversity

Tietoevry Create

Impactful, global digital engineering partner enabling customers' competitiveness

Our business



Advanced design, data, AI and software engineering business

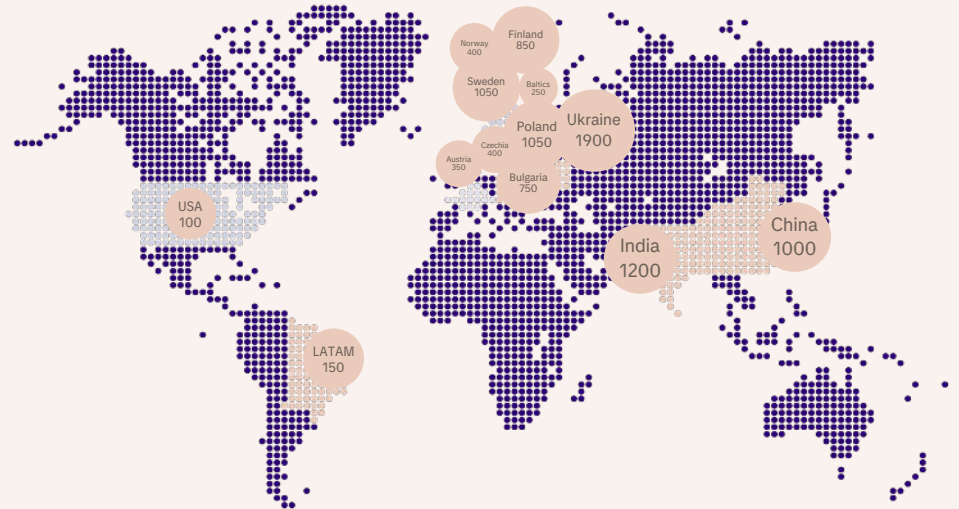


Impactful capabilities at scale, working on things that matter to customers, employees and the society



Global engagement model with 10 000 digital engineers in 23 countries

Global scale



Trusted by the world's biggest names



Industry knowledge expertise

Healthcare



Financial Services



Telecommunications



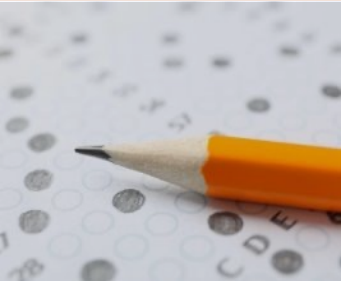
Automotive



Manufacturing



Public



Energy & Utilities



Agriculture



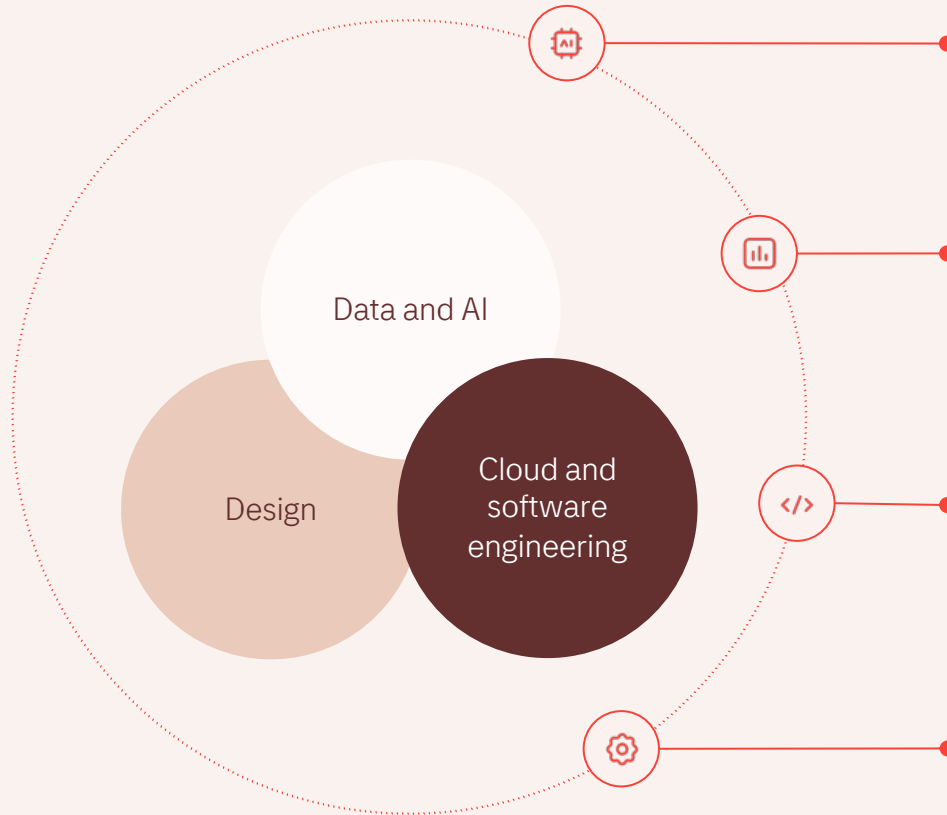
CPG & Retail



Transportation



World-class digital engineering services



Digital Product, Service & Applications development

Human centric Design-led engineering and Customer experience

Data driven and Intelligent business

Data and AI strategy, Data management & Platforms, Analytics, Data & AI Engineering

Advanced technology Development

Chip to cloud, cutting edge technology development such as 5G, IoT & Digital twin, Autonomous mobility and applied AI

Technology and engineering Excellence

Cloud Native Development & Modernization, Platform engineering, DevSecOps and Cybersecurity

Overview of the Digital Product Passport

The European Union's Green Deal and the EcoDesign for Sustainable Products Regulation (ESPR) promote sustainability by gathering lifecycle information and advancing the circular economy, which emphasizes recycling and reusing over the traditional take-make-waste model.

Definition

Digital Product Passports is a digital record & representation of a product's lifecycle.

It provides critical information of product's lifecycle such as

- ✓ origin & materials
- ✓ production details
- ✓ supply chain traceability
- ✓ environmental impact
- ✓ maintenance
- ✓ end-of-life

How it works

Product's influenced by DPP need to have a digital record of the product's information.



QR-code, barcode or other technology (NFC, RFID) where DPP can be accessed.



DPP consists of static & dynamic data which is recorded throughout product's lifecycle.



Information is reported to EU, but also made accessible to customers via portals etc.

Benefits

Product information included in DPP is becoming increasingly more important in today's global market.



Increased sustainability, supply chain traceability & circular economy.



New business models for servitization & product lifecycle.



Improved product trust & safety.

DIGITAL PRODUCT PASSPORT

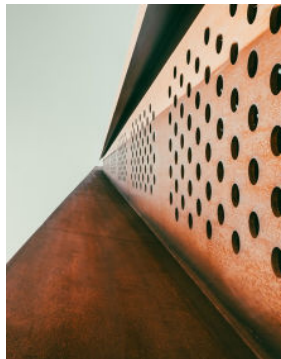


EXAMPLE PRODUCT

General Components Maintenance Materials

Product name	Example product
Serial number	SN 001
Product type	Example machine
Production	Factory Finland ⊙
Production date	15.2.2023 📅
Suppliers	Supplier Europe
Recyclability	Partly recyclable ⊙

Products affected 2027



Iron



Textiles



Detergents



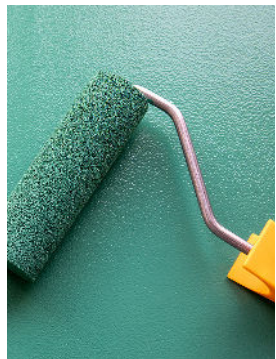
Chemicals



Steel



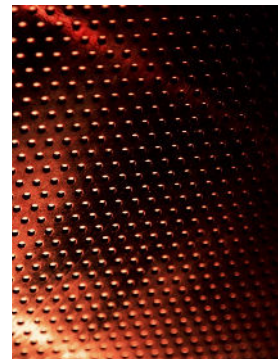
Furniture



Paints



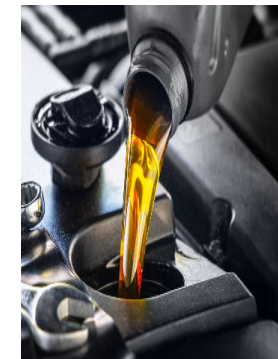
Energy related



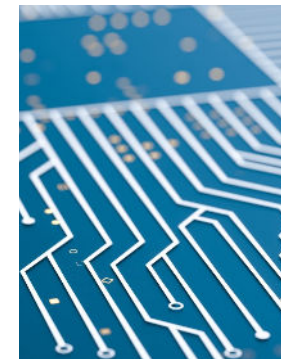
Aluminium



Tyres



Lubricants



Electronics

Main Categories in ESPR




DPP







Characteristics

-  **Specification**
Product and packing attributes
-  **Identifiers**
Unique identifiers for public authorities
-  **Compliance**
Certifications and declarations

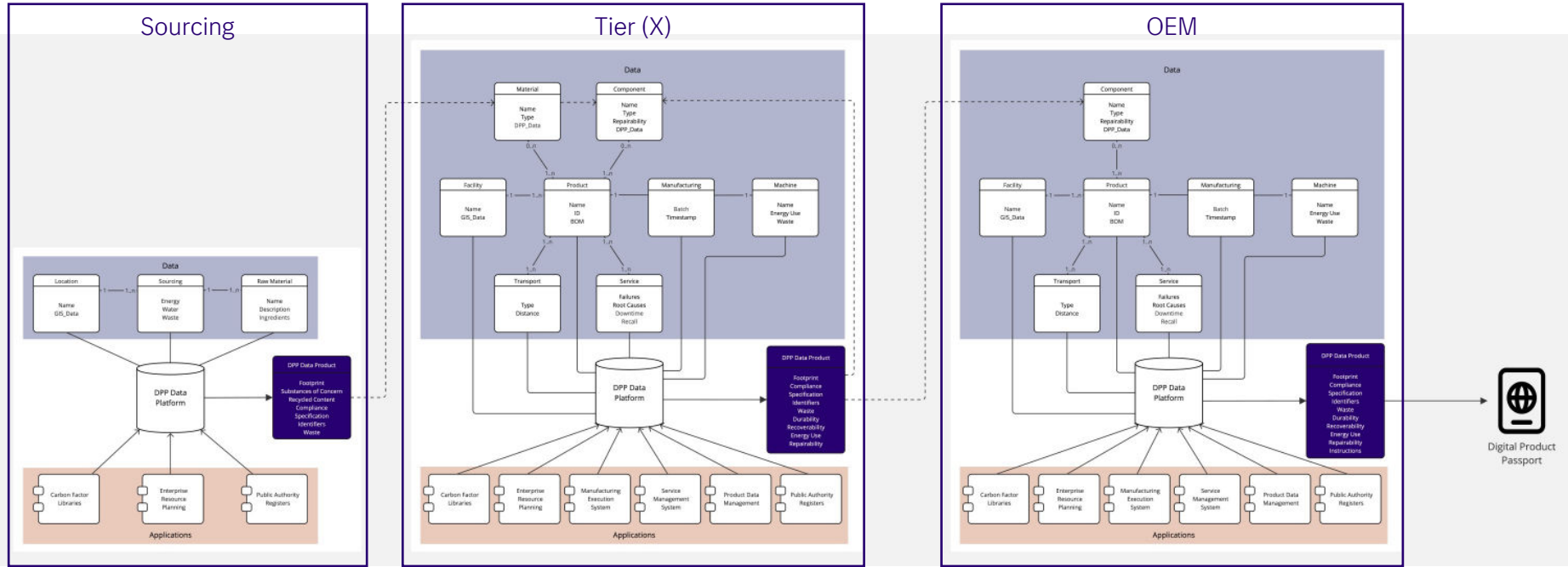
Impact

-  **Sustainability**
Footprint and environmental influences
-  **Recyclability**
Used materials and ease of separation
-  **Water use**
-  **Waste**
-  **Footprint**
-  **Re-manufacturing**
-  **Energy use**
-  **Resource use**
-  **Recycled content**
-  **Substance of concern**

Circular ability

-  **Durability**
Lifetime and frequency of errors
-  **Upgradeability**
Compatibilities and use of standards
-  **Repairability**
Instructions and modular design
-  **Reusability**
Information and IP usage for reuse
-  **Recoverability**
-  **Maintenance & refurbishment**

DPP Responsibilities & Data Flow

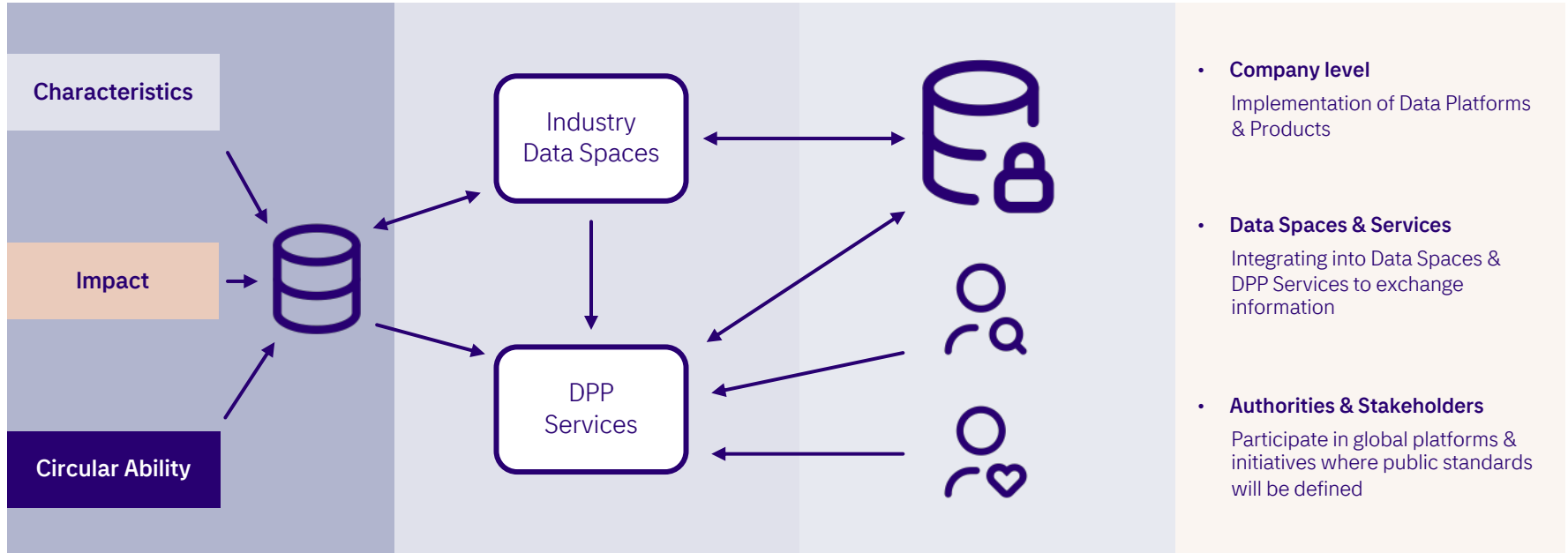


DPP Eco-System approach

Company level

Data Spaces & Services

Authorities & Stakeholders



👥 Customers

🛡️ Authorities



DPP

- ☰ Specification
- 📄 Identifiers
- 🛡️ Compliance

- ♻️ Sustainability
- 🍃 Recyclability

- 🗨️ Durability
- ⬆️ Upgradeability
- 🔧 Repairability
- 🔄 Reusability

Product



Pre-processing

(Raw)
Material Suppliers

TIER 1,2,3...

🏠 tietoevy



Manufacturing

Procurement

R&D

Supply chain



Distribution



Use



Maintenance



End of life

Recycling

Disposal

Reuse

An overview of our DPP Data Assessment



DPP

Specification

Identifiers

Compliance

Sustainability

Recyclability

Durability

Upgradeability

Repairability

Reusability

TWO TYPES OF DATA

DYNAMIC (Changing Processes & Materials)

STATIC (Repetitive Processes & Materials)

PRE-PROCESSING

MANUFACTURING

DISTRIBUTION

USE

END-OF-LIFE

Primary production

Produced goods and services

Types of Transport

Customers and end-users

Disposal

First tier supply

Including product details such as materials, components & environmental impact.

Maintenance

Recycling

2..n tier supply

Reuse

DPP Data map

Category	Attribute	Is Specific	Operational Level	Source System	Data Maturity/Level	Processing System	Priority	Relevance	Criticality	Comments
Identifiers	Unique Product Identifier	FALSE	Model	Not available	High	Not available	High	TRAC	5	
	Unique Part Identifier (Assembly/Component or parts)	FALSE	Model	Not available	High	Not available	High	TRAC	5	
	Unique Operator Identifier - Origin	TRUE	Batch	Ready to use	High	TRAC	High	TRAC	10	
	Unique Operator Identifier - EU	TRUE	Batch	Ready to use	High	TRAC	High	TRAC	10	
	Unique Facility Identifier	FALSE	Batch	Ready to use	High	TRAC	High	TRAC	10	
Compliance	UNSC Code	FALSE	Model	Not available	High	Not available	High	TRAC	5	
	ICDN Number	FALSE	Model	Not available	High	Not available	High	TRAC	5	
	Declaration of Conformity	FALSE	Model	Not available	High	Not available	High	TRAC	5	
	Technical Documentation	FALSE	Model	Not available	High	Not available	High	TRAC	5	
	Certification	FALSE	Model	Not available	High	Not available	High	TRAC	5	
Durability	Guaranteed Lifetime	FALSE	Model	Ready to use	High	TRAC	High	TRAC	5	
	Technical Lifetime	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
	Mean Time Between Failures	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
	Resistance to Stressors or Aging	FALSE	Model	Not available	High	TRAC	High	TRAC	10	
	Custom Footprint	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
Sustainability	High quality Resource	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Dimensions (L, W, H, S, etc)	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Waste generated	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Commodities for Use and Maintenance	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Incorporation of used Components	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
Reusability	Use of recycled Materials	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
	Consumption of Energy	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Consumption of Water	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Consumption of other Resources	TRUE	Batch	Not available	High	TRAC	High	TRAC	5	
	Access to product data	TRUE	Batch	Not available	High	TRAC	High	TRAC	5	
Specification	Availability of Capabilities in the Manufacturing	TRUE	Batch	Not available	High	TRAC	High	TRAC	5	
	Right to use Intellectual Properties	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Weight and Volume (Product)	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Weight and Volume (Packaging)	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Product Footprint/GeoID	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
Responsibility	User case Materials	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
	Availability of Spare Parts	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Modularity	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Compatibility with commonly available Spare Parts	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Repair and Maintenance Instructions	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
Recyclability	Compliance with commonly available Spare Parts	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Tools needed for Repair Process	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Non-destructive Disassembly and the assembly	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Design of Refurbish Substances	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
	Low off-gassing of VOCs	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
Upgradeability	Percentage of recyclable Materials used	TRUE	Batch	Not available	High	TRAC	High	TRAC	10	
	Compatibility with established Repair Processes	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Availability of Repair Instructions	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Recycling codes	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
	Design of HV and SW Standards	FALSE	Model	Not available	High	TRAC	High	TRAC	5	
Compliance with relevant HW and SW Standards	FALSE	Model	Not available	High	TRAC	High	TRAC	5		

- Identifies product's data needs (categories & attributes)
- Assessment on data character, input, maturity & priority to enable gap analysis
- Helps with calculating criticality of each data attribute to prioritize further development items
- Assesses "full" picture on product's DPP data readiness



Execution of the DPP Data Assessment

Needs

TARGET

Establish DPP data mapping, high-level architecture & roadmap. Create a base for PoC's and further design of the solution.

ACTIONS

- Selection of relevant chapters and attributes
- Analysis of connected business goals
- Identification of related source systems and stakeholders
- Design of data model and data flows
- Investigation of risks and potential challenges

Sprint

MAIN GOAL: Conduct data assessment and high-level next steps to enable decision making and solutioning of further DPP landscape.



PRESTUDY

- Relevant topics & business goals
- Current situation



DATA ASSESSMENT

- Data accessibility & maturity
- Systems & IT landscape
- Filling gaps & draft architecture
- Draft roadmap
- Next steps & business potentials



VERIFICATION & FINALIZATION

- Results evaluation & changes
- Final presentation to key stakeholders
- High-level roadmap with identified next steps, decisions, development items & risks

Deliverables

DPP Data Map

Mapping DPP data from different perspectives (e.g. data quality, priority, risks etc.)

Stakeholder Map

Owners of data, solution etc. for further development & governance work

High Level Architecture

Solution architecture in high-level to understand related systems

High Level Roadmap

High level understanding on next steps & timeline

Business Potentials

Connections to business strategy and goals (can be linked to other development areas such as Smart Factory, ESG etc.)

Attribution	Role	Priority	Risk	Quality
...

Role	System	Ownership
...

OUTCOME

- Initial understanding of development needs based on DPP Data Map & architecture
- Next steps to move forward with DPP journey & decisions to be made

CUSTOMER'S TEAM



Project Manager – SPOC for Tietoevry delivery team



Enterprise architect – Counterparty for customer's IT landscape



Different business owners – Counterparty for different data topics



DPP Data Advisor



Data Architect

DPP Solution: top-down view

1 DATA SOURCES

Information is gathered from various resources (internal & external) through supply chain.

2 DPP SYSTEM

DPP system includes data, API & integration and needed applications & portals.

3 API MANAGEMENT

Customer's preferred API Management solution is utilized to retrieve & share data from/to different systems & data sources.

4 DATA PLATFORM

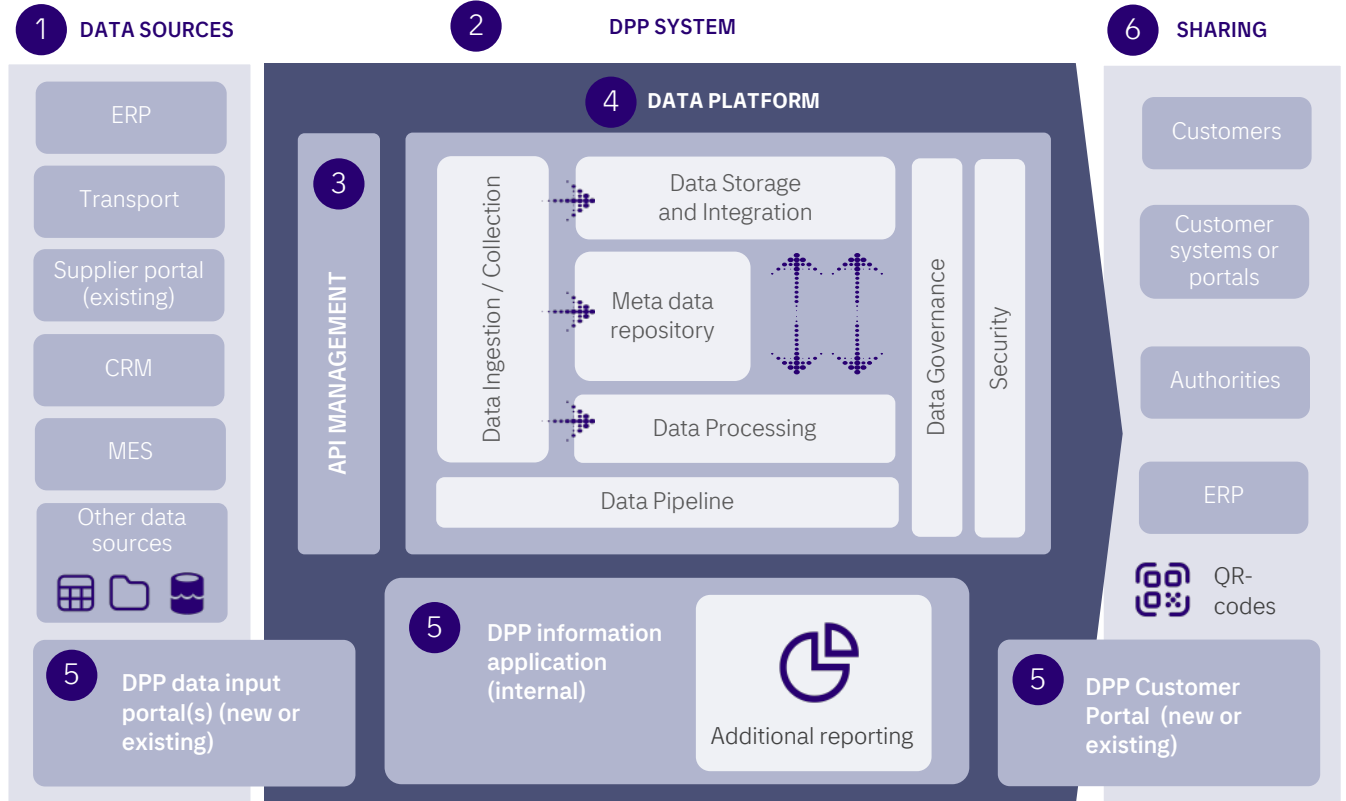
Data Platform is built on customer's preferred solution, and it covers all data needs for DPP data requirements.

5 APPLICATIONS & PORTALS

Internal & external solutions for data gathering screening & sharing can be built as part of solution.

6 SHARING

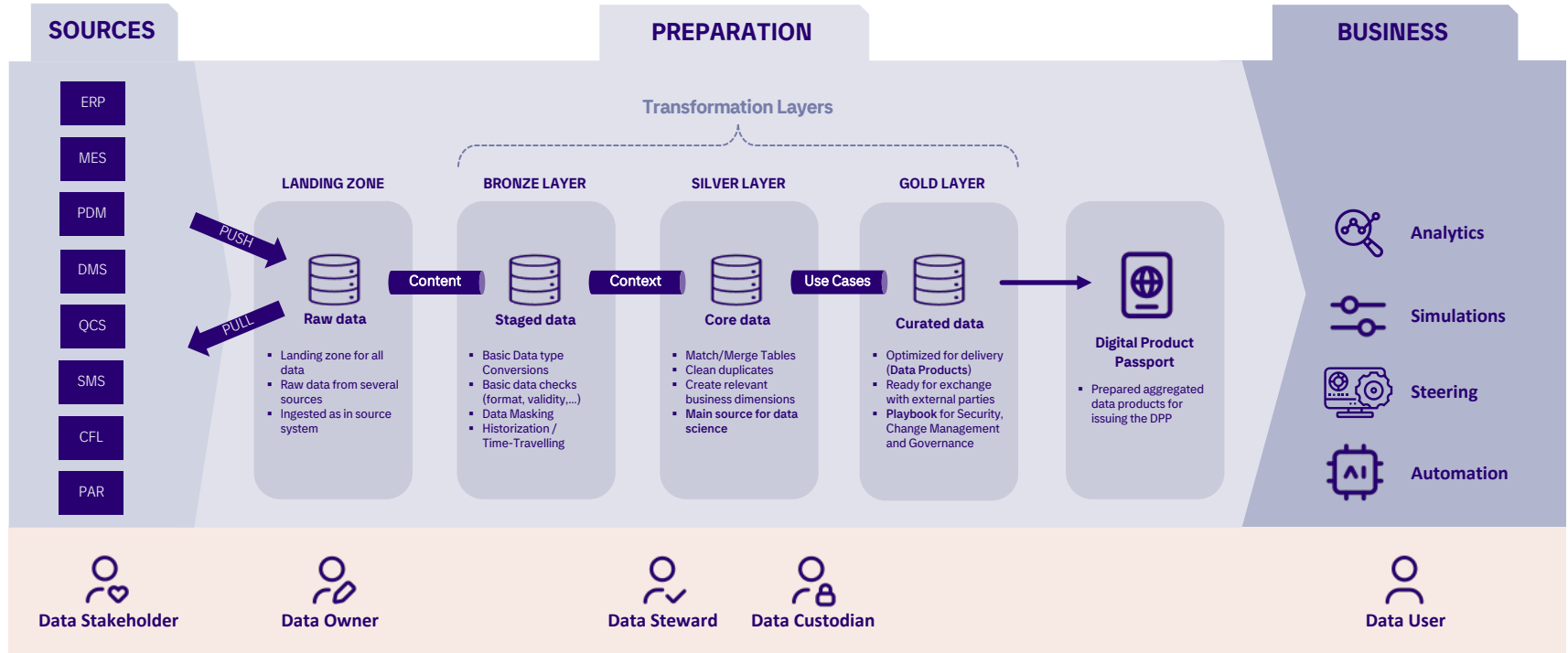
Data sharing is done through QR-codes in products to show in DPP portal or through APIs & integrations.



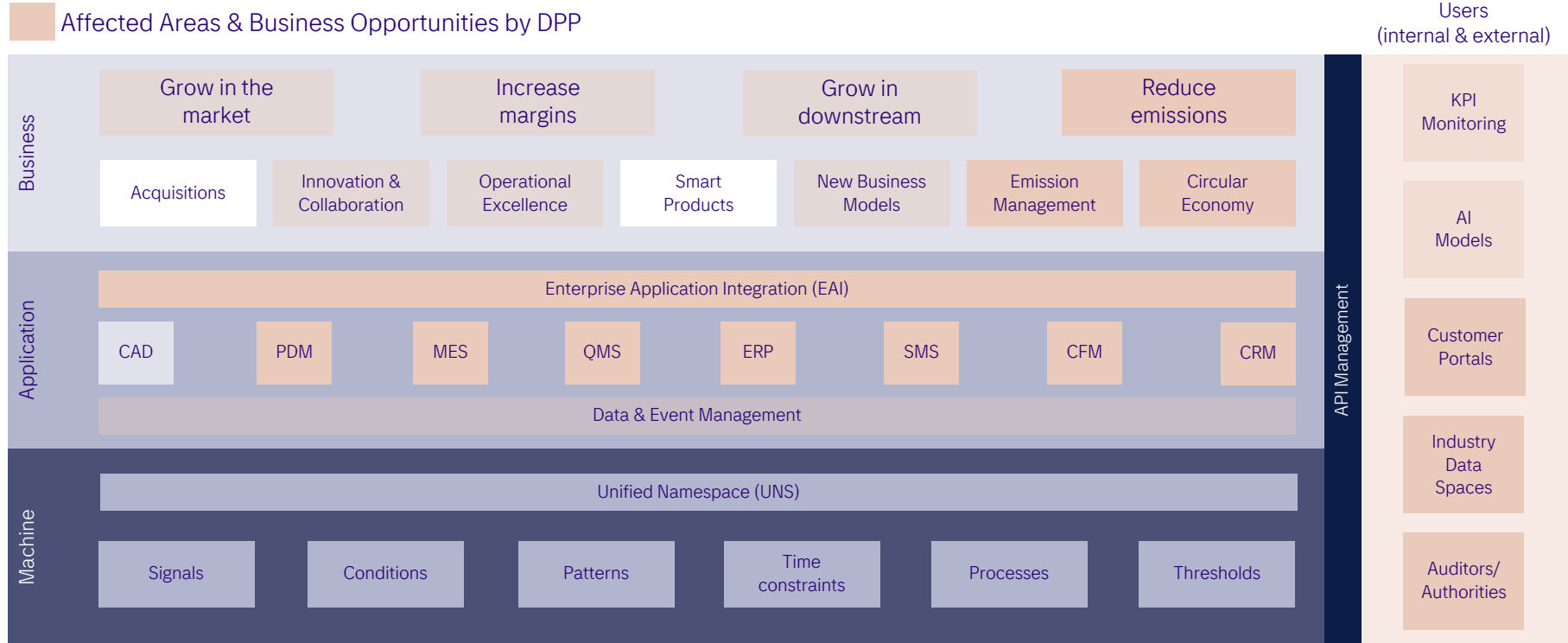
DPP Solution: buttom-up view

ERP = Enterprise Resource Planning
 MES = Manufacturing Execution System
 PDM = Product Data Management
 DMS = Document Management System

QCS = Quality Control System
 SMS = Service Management System
 CFL = Carbon Factor Library
 PAR = Public Authorities Register



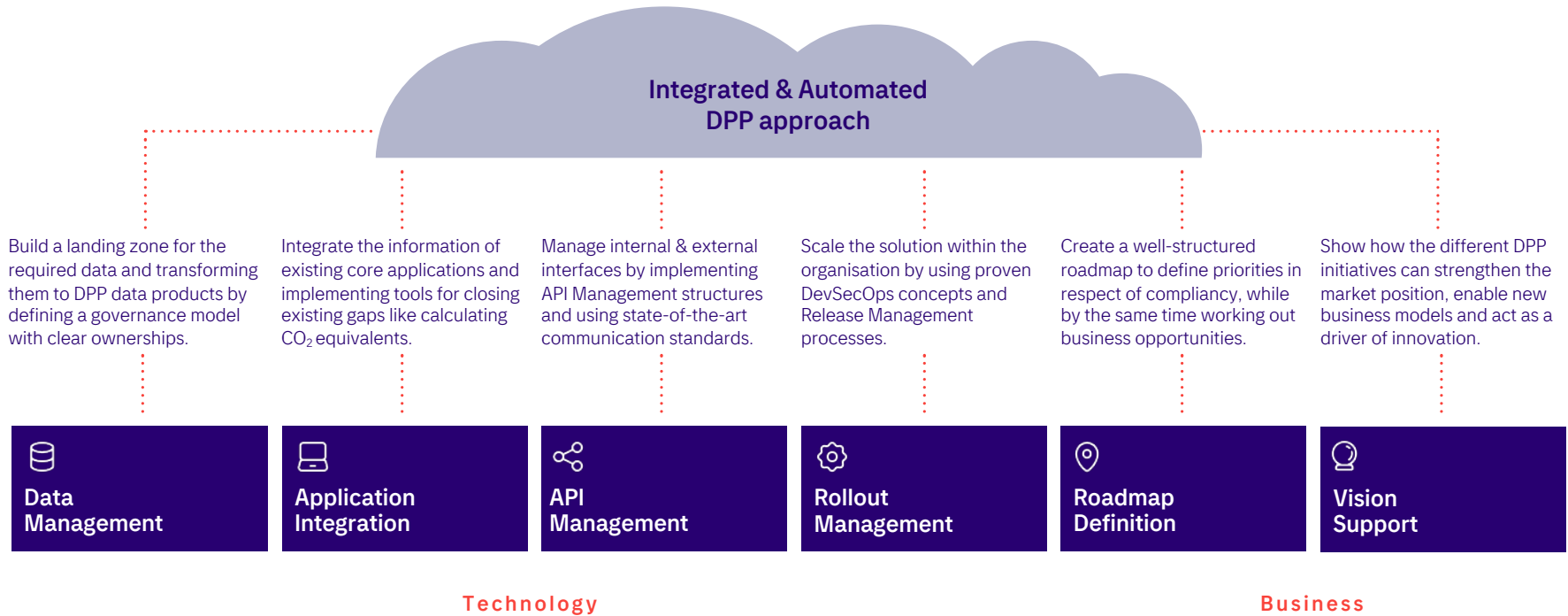
Digital business map for Automotive & Manufacturing



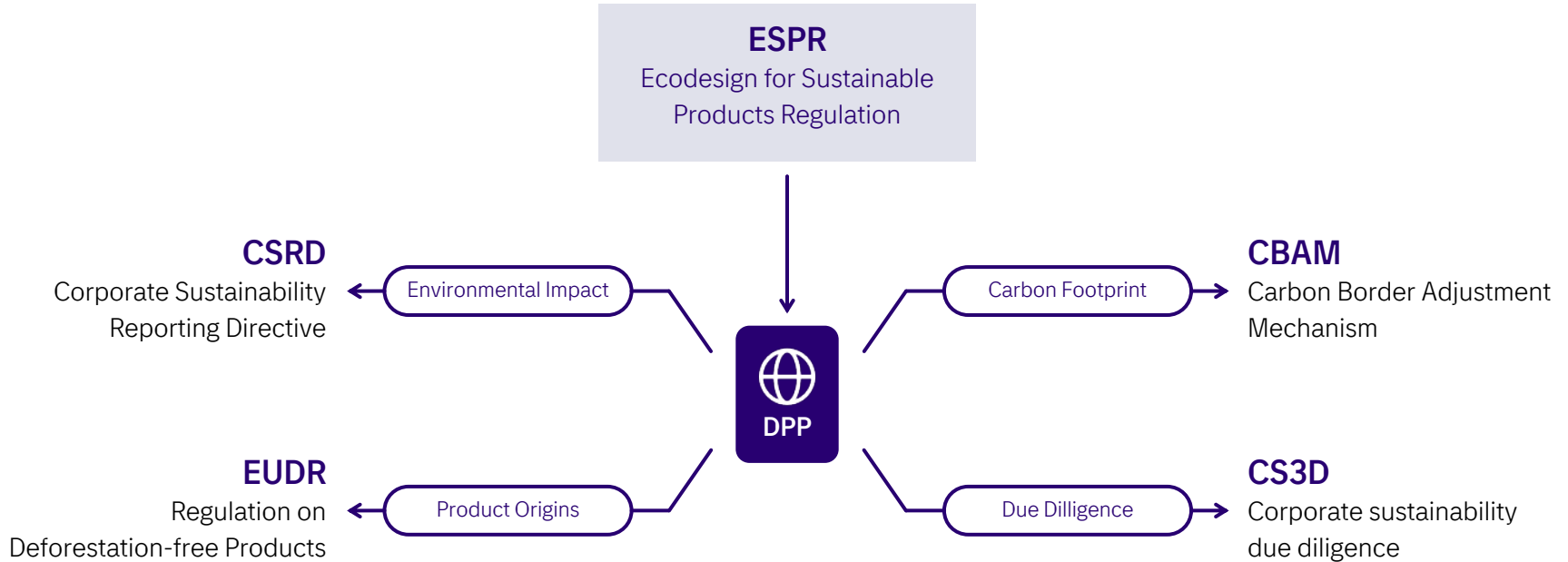
CAD = Computer Aided Design
 PDM = Product Data Management
 MES = Manufacturing Execution System
 QMS = Quality Management System

ERP = Enterprise Resource Planning
 SMS = Service Management System
 CMA = Carbon Management & Accounting
 CRM = Customer Relationship Management

Why choose Tietoenvy?



Reusability of DPP



Selected References



Airport operations and sustainability analytics

Airport operations analytics to improve sustainability and optimize maintenance processes, real-time analytics, self-service analytics

Reduction of the chemical use in runway de-icing, unexpected weather condition prediction, real-time data supporting planning and field work

- Data platforms
- Analytics and AI
- Sustainability analytics



ESG Proof-of-Concept for global furniture retailer

Microsoft Sustainability Manager PoC on historical environmental and social data incl. data preparation and aggregation, CO2 calculation and trainings.

Flexible and user-friendly solution, identification of key data issues that need to be solved

- Data platforms
- Data collection automation
- ESG technology implementation
- Sustainability reporting

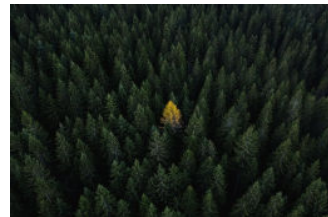


ESG reporting platform implementation for circular economy company

Microsoft Sustainability Manager implementation, data identification and availability

Unified CO2 calculation; cross-functional platform for sustainability reporting, decision-supporting analytics and value chain collaboration, building CSRD readiness

- ESG technology implementation
- Sustainability reporting
- Data sharing



Life-cycle assessment digitalization pre-study for forest industry company

Data requirements assessment for LCA and traceability, roadmap for data quality and reporting automation

Insight into LCA data quality in source systems, identified possibilities to data integration and source scope expansion, data quality rules

- Sustainability data assessment
- ESG data architecture
- Data standards and quality



Environmental calculation solution for event industry

Material and carbon footprint calculation and budgeting tool for festivals and large events

Holistic insight into carbon footprint, emissions and material footprint, enabling to consider the environmental effects already in the planning phase of events

- Sustainability data assessment
- ESG data architecture
- Data standards and quality

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Thank you

 tietoevry

