Business Strategies using connected Products: Rethinking Product Information Management

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Aarhus University - online & in-person
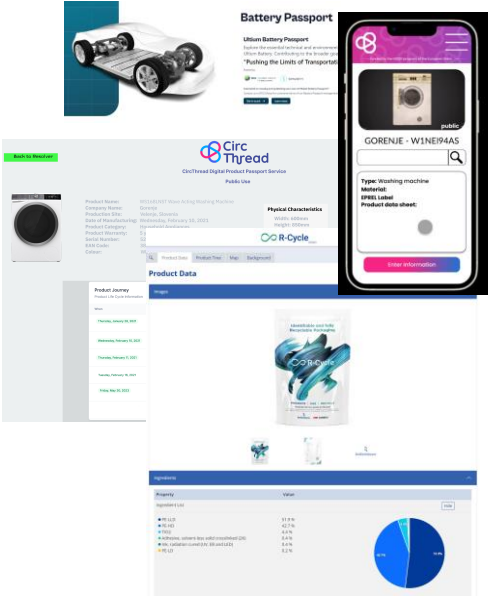
01/03/2024

Digital Product Passports
A new information ecosystem for Connected Products
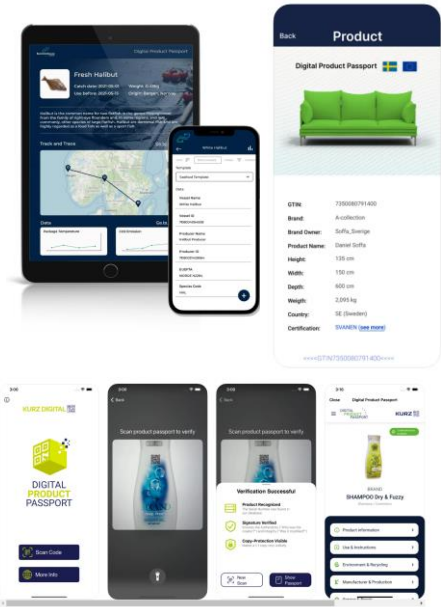
1. Data carriers

At model, batch, item level

2. Product info portal

With public info & access rights controlled info

3. App services

To exchange, create and use info

Market conformity & claims verification

Product identifier for customs authorities

Access point of certificate(s) for EU declaration of market conformity

Info for individuals to check counterfeits

Background evidence for green claims

We expect most products to use QR-codes for DPP's, with some needing automation through RFIDs

	Text code	Barcode	QR-Code (Quick response)	Data Matrix Code	Radio Frequence ID (RFID) / Near Field Communication (NFC)
Cost	€	€	€	€	€€
Scanner					
Pros	+ Cheap to apply at scale + Low barriers for printing	+ Small size + Interoperable standards	+ Small size + High information storage + More resilient to damage + Interoperable standards + Widespread use	+ Small size + High information storage + Resilient to damage. + Interoperable standards + Used in industry	+ Does not require line-of-site → reduce cost, placement in product possible + Multiple tags can be scanned at a time + Widespread use
Cons	- Only useful for manual look up	- Small damage can destroy readability - Only one scan possible at a time	- Can have longer print times - Only one scan possible at a time	- Not easily scannable by end-user - Only one scan possible at a time	- Significantly more expensive per-unit than printed codes

Identifiers must persist and be useful throughout their lifetime from creation to disposal.

Driven by legislative requirements to deliver a single market of information about products in the EU

- A single market means the **same compliance with the rules** everywhere within the EU. Today there are **too many free-riders within the EU market, especially in case of on-line stores sellers,** as a **universal product information management system** is missing.

- In the future Digital Product Passports will be the means to **show compliance with all EU rules to sell on the EU market** through a common certificate of compliance, to be made available in each DPP's information portal, reachable via the future EU central registry.

- The **digital identifiers** in the QR-code or similar data carriers attached to the product will include **location of production, manufacturer ID, brand ID and (likely) a customs ID.**

- **The DPP itself will be integrated in the EU customs system.**

EU ESPR regulation text: "The role of customs should be to ensure that t**he reference of a product passport is made available in the customs declaration** and that the relevant information of the customs declaration corresponds to the information that is stored in the registry"... "Customs authorities may release a product for free circulation **only after having verified as a minimum that the unique registration identifier and the commodity code provided** or made available to them correspond to the information stored in the registry"**."**

Driven by legislative requirements to help make sure Made in Europe = Made sustainable

- DPPs are the information management component <u>to show in the future how sustainable products are</u>, or where there are still gaps.

- The twin part are **new performance requirements** that will be laid down for **environmental and circular performance** in delegated acts per product category.

- The EU ESPR regulation **includes budget for <u>30 product categories by 2030</u>** to have their own Ecodesign delegated act.

- These will for many products likely incl. **<u>durability and repairability requirements</u>** based on universal scoring calculation linked to universal labelling.

REPAIRABILITY SCORE

9,5 /10   7,5 /10   5,5 /10
1,0 /10   3,5 /10

TRANSFORMATION DE L'ÉCONOMIE

La France abandonne son indice de durabilité sur les smartphones et tablettes

Publié le 21 février 2024

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Zakia Khattabi

Minister of Climate, the Environment, Sustainable Development and Green Deal

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Press Release   2 June 2023

PR | Belgium becomes the second European country to introduce a reparability index

As a result DPPs will help to create the societal shift in solving the problem of free riders and green washers

Problem 1: few companies want to green wash or free ride but many companies do it to stay competitive (e.g. products with green claims have higher sales potential than without green claims).

Problem 2: Companies that spend several % of revenues on making their products greener are not rewarded today, as their competitors get away with NOT acting and can still put on a stamp 'Carbon Neutral'

Which of these products would you buy?

CLEAR PACKING TAPE vs COMPETITORS

CLEAR PACKING TAPE
✓ 2X THICKER THAN TRADITIONAL TAPE
✓ STAYS SEALED THROUGH TRANSIT
✓ FITS STANDARD DISPENSERS
✓ 8% MORE TAPE PER ROLL

COMPETITORS
✗ THIN AND FLIMSY TAPE THICKNESS
✗ EASILY BREAKS UNDER PRESSURE
✗ LOOSE TAPE GUN FIT
✗ LESS BANG FOR BUCK

Try our exclusive **Carbon Neutral Tape!**
Receive a **FREE Tape Dispenser** When you buy 1 case (36 rolls)
Offer ends Friday 1st December 2023
Ts & Cs apply. One per customer.

CARBON NEUTRAL TAPE MADE FROM RECYCLED MATERIAL

The EU ESPR regulation (agreed in January by the EU institutions) budgets 30 product groups by 2030 to be required to have a DPP

Product groups listed in ESPR legislation & mentioned in EU consultations

Product groups listed in other EU regulations
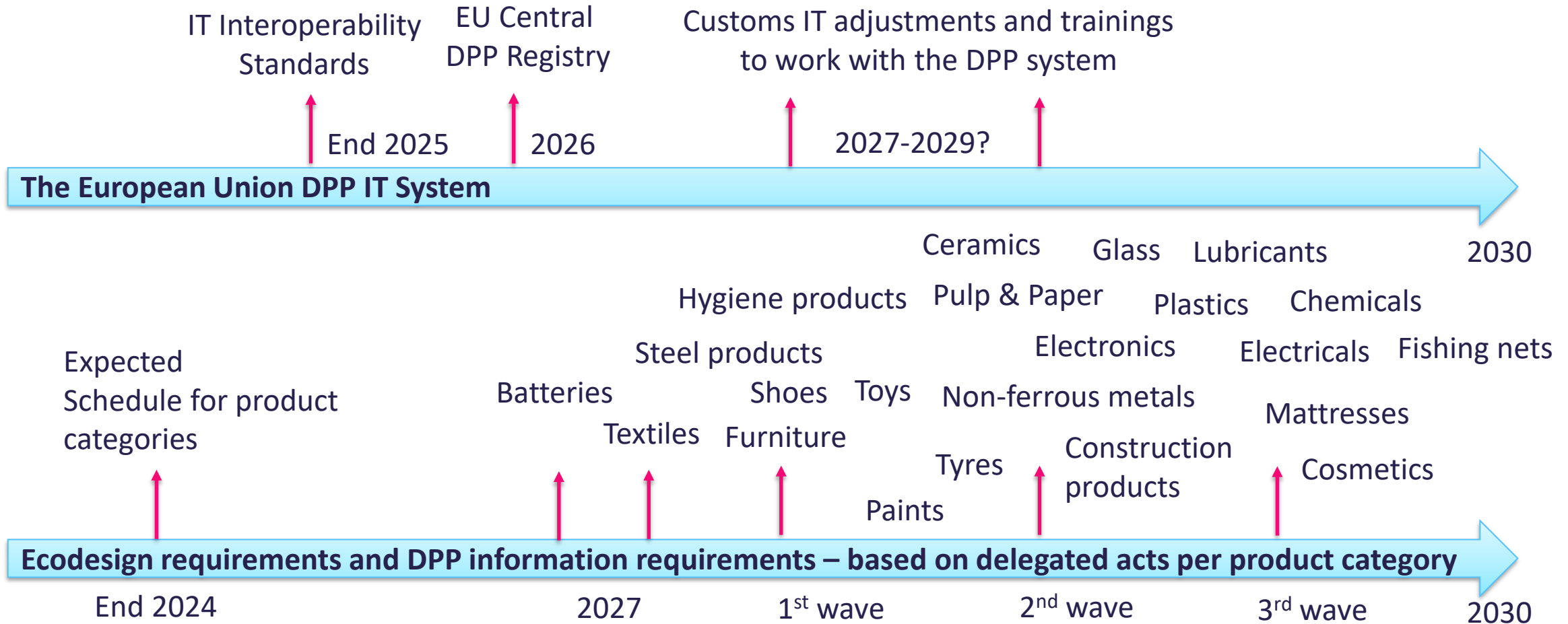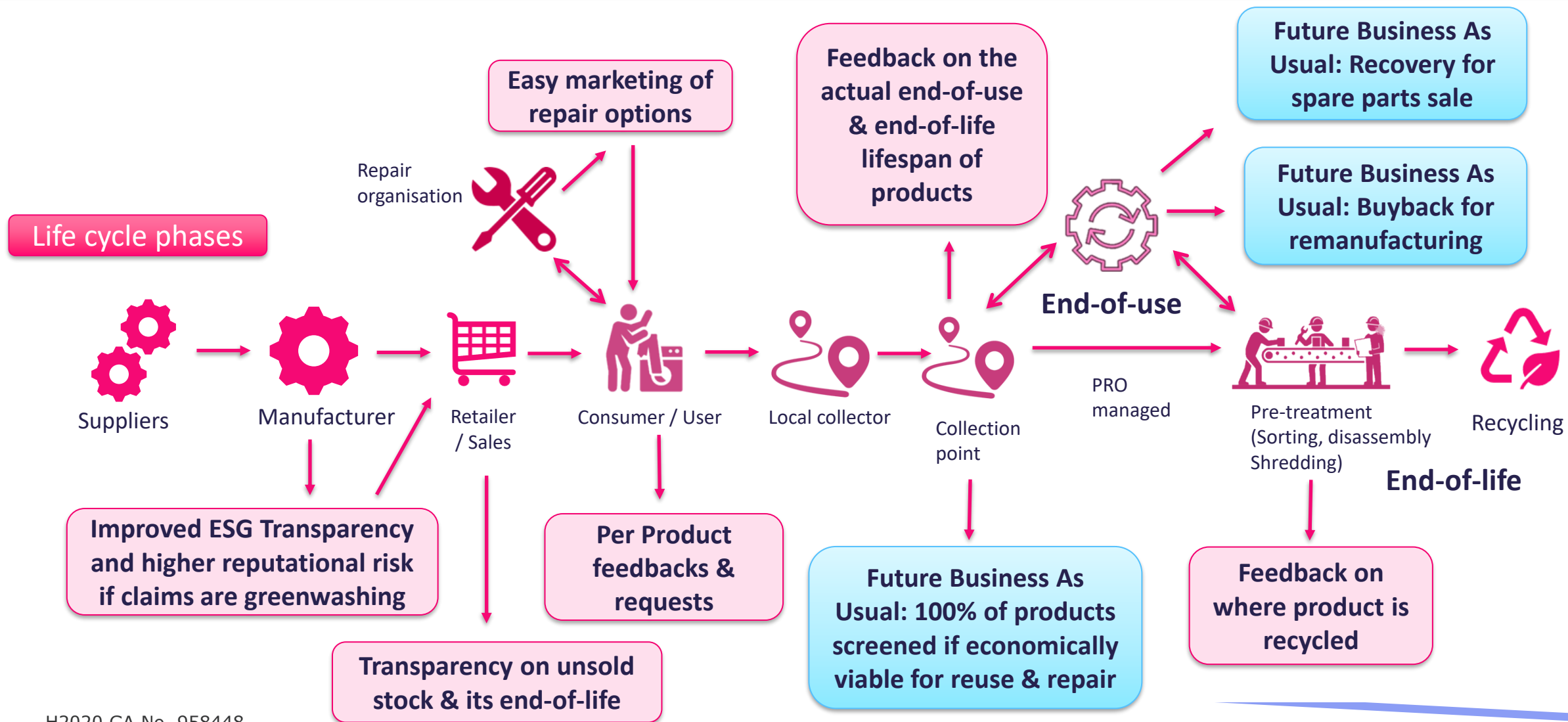
Batteries (2026)

Construction products

Textiles

EU ESPR regulation text: "This Regulation shall apply to any physical good that is placed on the [EU] market or put into service, including components and intermediate products...However, it shall not apply to: food, feed, medicinal products, veterinary medical products, living plants, animals and micro-organisms, products of human origin, products of plants and animals, vehicles."

The speed at which Digital Product Passports will be introduced until they are commonplace by 2030
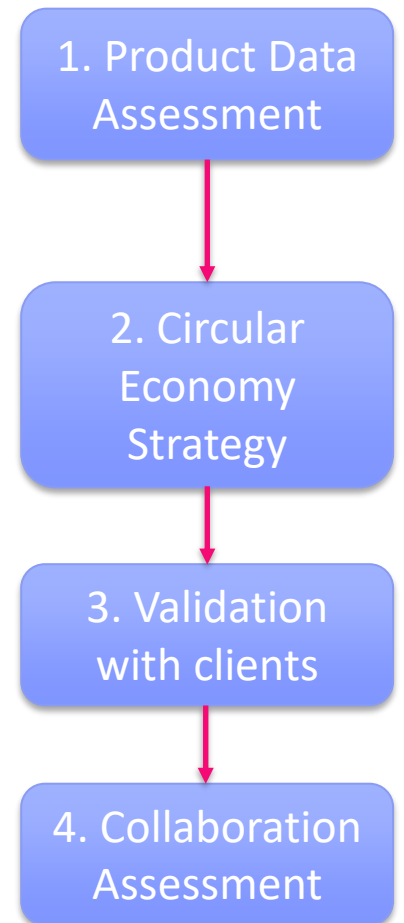
IT Interoperability Standards

EU Central DPP Registry

Customs IT adjustments and trainings to work with the DPP system

End 2025

2026

2027-2029?

The European Union DPP IT System

2030

Ceramics   Glass   Lubricants

Hygiene products   Pulp & Paper   Plastics   Chemicals

Steel products   Electronics   Electricals   Fishing nets

Expected Schedule for product categories

Batteries   Shoes   Toys   Non-ferrous metals   Mattresses

Textiles   Furniture   Tyres   Construction products   Cosmetics

Paints

Ecodesign requirements and DPP information requirements – based on delegated acts per product category

End 2024   2027   1st wave   2nd wave   3rd wave   2030

Business Strategy 1: rethink into who will connect with your products' DPP for circular life cycle management

Life cycle phases

Repair organisation

Easy marketing of repair options

Feedback on the actual end-of-use & end-of-life lifespan of products

Future Business As Usual: Recovery for spare parts sale

Future Business As Usual: Buyback for remanufacturing

End-of-use

Suppliers

Manufacturer

Retailer / Sales

Consumer / User

Local collector

Collection point

PRO managed

Pre-treatment (Sorting, disassembly Shredding)

Recycling

End-of-life

Improved ESG Transparency and higher reputational risk if claims are greenwashing

Per Product feedbacks & requests

Future Business As Usual: 100% of products screened if economically viable for reuse & repair

Feedback on where product is recycled

Transparency on unsold stock & its end-of-life

Business Strategy 2: Evaluate how you can further digitise with connected partners for circularity

1. Assess **currently available product data,** where it is kept, and how it is managed (incl. product identifiers, procurement, design data, supply chain, product characteristics)

2. Carry out **strategic workshops** to determine the **circular economy product information requirements** for your business (e.g. compliance needs such as % recycled content, cost savings or new business opportunities from spare parts recovery, improved sales expectations).

3. If needed, validate the **product information requirements** with B2B clients or B2C consumers.

4. Evaluate **which business partners** or **new collaborations are needed** to unlock the product information requirements

1. Product Data Assessment

2. Circular Economy Strategy

3. Validation with clients

4. Collaboration Assessment

Business Strategy 2: Evaluate how you can further digitise with connected partners for circularity

5. Survey **business partners** (e.g. suppliers, resellers) **and new collaborators on available data** in relation to needs within the circular economy use case

6. Determine based on the product information requirements what **additional data systems** are needed for product information management.

7. Create a procurement brief, **and evaluate different providers of these IT data systems** and their integration options for existing systems. Alongside internal new data management roles/processes.

8. Procure **new data capabilities** and implement the circular economy data system

5. Survey collaborators

↓

6. Evaluate IT data enhancement

↓

7. Create a procurement brief

↓

8. Implement new data capabilities
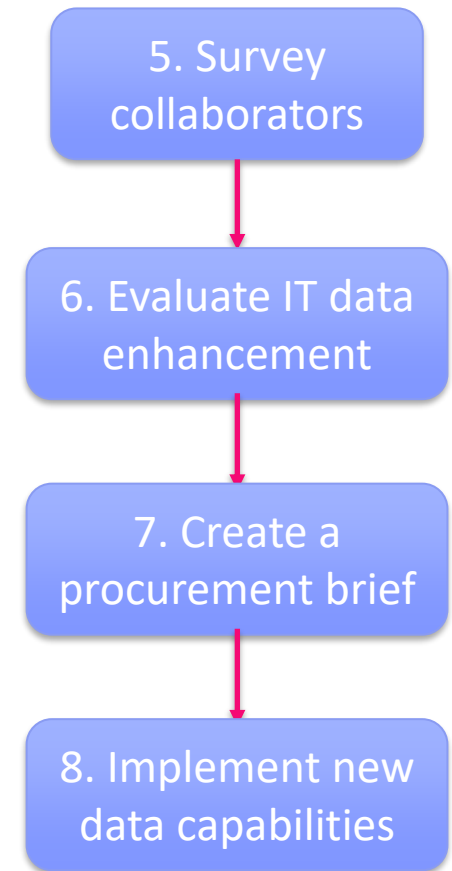
Business Strategy 3: actively watch standardisation efforts in your sector OR be involved in shaping relevant standards

Specific product category standards for circularity will interlink with DPP in delegated acts

Example: Standardisation committee CEN TC 207 (Furniture) and its Work Group 10 (Requirements and tools for furniture circularity). **Standard to be published this year: FprEN 17902 on evaluation method for dis/reassembly capability (2024).**

Likely to be linked to the Delegated Act for Furniture
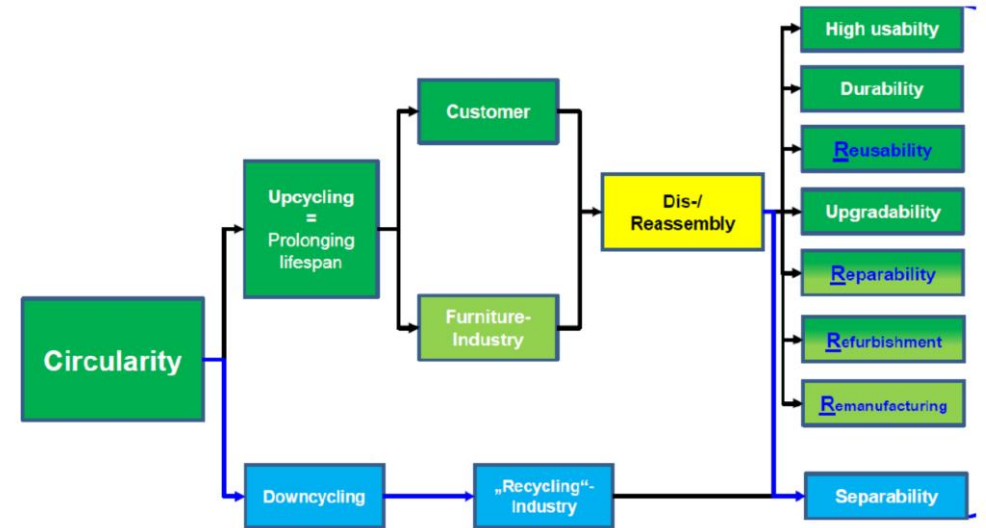
Note: This is driven largely by pro-active furniture industry & research sectors – not by the legislator

Example CircThread Project
showcase of Digital Product Passports

eco wise

Circ Thread

CircThread Digital Product Passport Service

Public Use

Product Name:	WS168LNST Wave Acting Washing Machine
Company Name:	Gorenje
Production Site:	Velenje, Slovenia
Date of Manufacturing:	Wednesday, February 10, 2021
Product Category:	Household Appliances
Product Warranty:	5 years
Serial Number:	52890001
EAN Code:	3838782079399
Colour:	White

Physical Characteristics

Width: 600mm
Height: 850mm
Depth: 610mm
Gross Weight: 86.2 kg
Net Weight: 84.7 kg

Efficiency/Performance Characteristics

Energy Efficiency Class: A+++
Spinning Performance Class: A
Noise Level Spanning dB(A): 77
Washing Capacity: 10 kg
Wave Active Drum: Yes
Drive: Inverter PowerDrive Motor

Back to Resolver

Product Journey

Product Journey
Product Life Cycle Information

When	What	Who	Where
Thursday, January 28, 2021	Raw materials arrived to facility. Required raw materials are brought together.	XYZ Co. Edward J.	Velenje, Slovenia
Wednesday, February 10, 2021	Manufactured Final product is ready.	Gorenje Mejda Meza	Velenje, Slovenia
Thursday, February 11, 2021	Shipped Final Product is delivered to Retailer	CMD Cargo Yigit Yayalar	Maribor, Slovenia
Tuesday, February 16, 2021	In-Use Product is sold to the End-user	Jorge Jesus	Kranj, Slovenia
Friday, May 30, 2023	Repaired General Maintenance of the machine.	Lys Technical Service Smith Brown	Kranj, Slovenia

Circularity/Sustainability

Environmental Responsibility

Carbon Footprint
Tier 3
2.4 kg/ cycle

Water Consumption
In Manufacturing Facility
15 L/ product

%Renewable Energy
In Manufacturing Facility
%30

Hazardous Substances
Weight: 0.14 kg
R290

Circularity

Recycling Rate
The percentage of recyclable materials actually recycled from waste
%45

Recycled Content
The total percentage of recovered material in a product.
%25

Minimum Life Span
The duration of time for which products continue to work and can be used
13 years

Design Considerations
Achieving an effective design for product by considering life cycle issues
13 years

Social Responsibility

Average Working Hour / Week
40 hours

Gender Distribution
Men (%50) — Women (%50)

Working Conditions
Health and Safety at work Work Balance

H2020 GA No. 958448

Circ Thread

Thank you

If you are interested in testing CircThread Services and Digital Product Passports with us please reach out to:

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circthread-project/