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# TOWARDS CIRCULAR CONSUMPTION

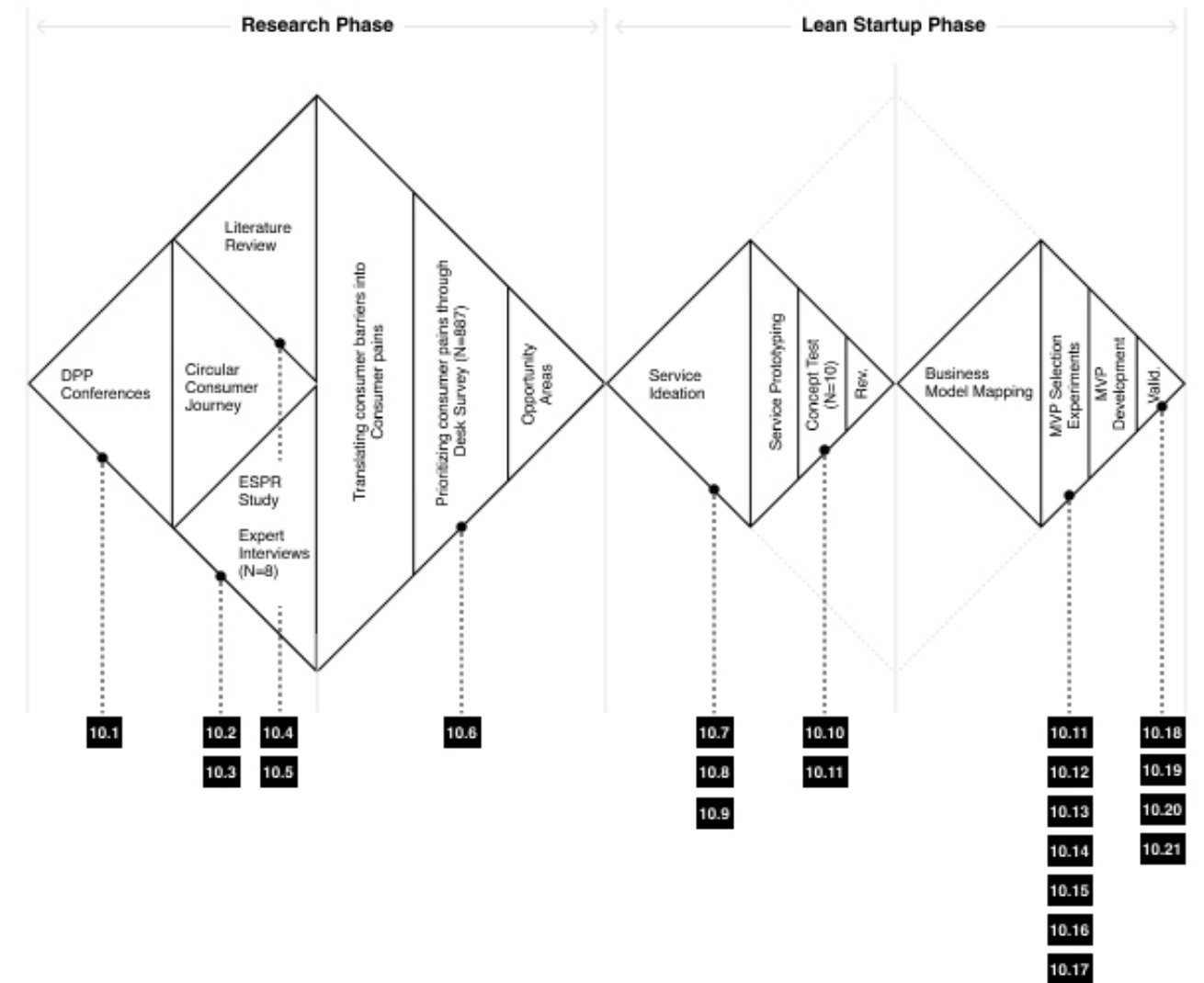
Facilitating circular consumer actions  
through a Digital Product Passport-enabled  
service platform

**Appendices**



# Appendices

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## 10.1 DPP conference memos

### Summarized field notes - Circular Tech Forum 2025

Cologne, 22.09.2025

#### 1. The underdeveloped picture of the consumer

- The consumer is missing in most of the discussions because they are naturally focussing on the actors that seem to be able to harness most of the value of the DPP. If we are talking about materials, batteries, chemicals etc. then the end-consumer is not of relevance. Focussing on consumer goods, such as textile, apparel and electronics allows more focussed discussion about the consumers role.
  - Where consumers are considered, trust, usability, and clear value-added services (maintenance, repair, resale, certifications) are crucial.
  - A “successful” DPP implementation is defined by R-strategies that start at the consumer.
  - Circulation of products increases the lifetime value (that can be monetized). Obsolescence is forcing brands to monetize once. Selling a new one is better than repairing an old one (linear economy). Obsolescence is happening at the consumer.

#### 2. Policy developments

- The DPP will come, one way or the other - it is too entangled within ESPR and other legislation.
- EU sets up infrastructure of DPP registry and DPP Web. Brands have to host their data.
- Blockchain is not mandatory.

#### 3. From Compliance Tool to Value-Enabling Services

- The DPP as compliance data in itself does not have a lot of value. Industry voices stress – value is created when data enables **services** for actors on the supply chain (e.g. resale, predictive maintenance, automated repair instructions, value analytics)
  - **Consumer-facing propositions** suggested:
    - Pre purchase chat bot trained on products DPP to counter purchase doubts/recommend other products
    - One-click resale and repair services via QR/NFC
    - Trust marks for product quality or verified repairs, potential connection to location
    - Insurance-like reassurance for safety gear and critical products
    - Value tracker that monitors resale value of your product based on its condition/repairs
    - AI generated repair instructions to empower the consumer to troubleshoot themselves
    - digitalized paperwork (e.g. manuals)
  - **Repair/Refurb/Recycle-facing** propositions:
    - Product assessment software that estimates based on DPP if Repair/Refurb is viable
    - Product composition analytics that can suggest the best recycle technique

#### 4. Differentiation Across Product Categories

- Higher-value, “smart” products (e.g. batteries, electronics) show clearer consumer-facing value than “dumb” or low-value products (e.g. textiles, small appliances), as in services of e.g. predictive maintenance.
- For consumer products like clothing or furniture, the promise is more about **brand interaction, storytelling, and sustainability proof**



## Summarized field notes – DPP Festival

The Hague, 09.10.2025

The DPP discussion is **shifting from compliance to value creation**. Policymakers and industries now recognize that consumer acceptance depends not on the existence of the passport, but on the *meaning and services* it enables. The consumer must *feel a benefit* from interacting with the DPP. The gap identified — *consumers not clicking the QR code* — is precisely where design-led value creation can make a difference.

### 1. Consumer Value

- Experts repeatedly noted that **consumers rarely open DPPs** or understand the QR code's purpose.
- **Environmental data (e.g., LCAs)** are meaningless to most of them
- Value may lie in **trust in authenticity, ownership visibility, or after-sales services**, not in compliance data itself.

### 2. Dual-Purpose Architecture Emerging

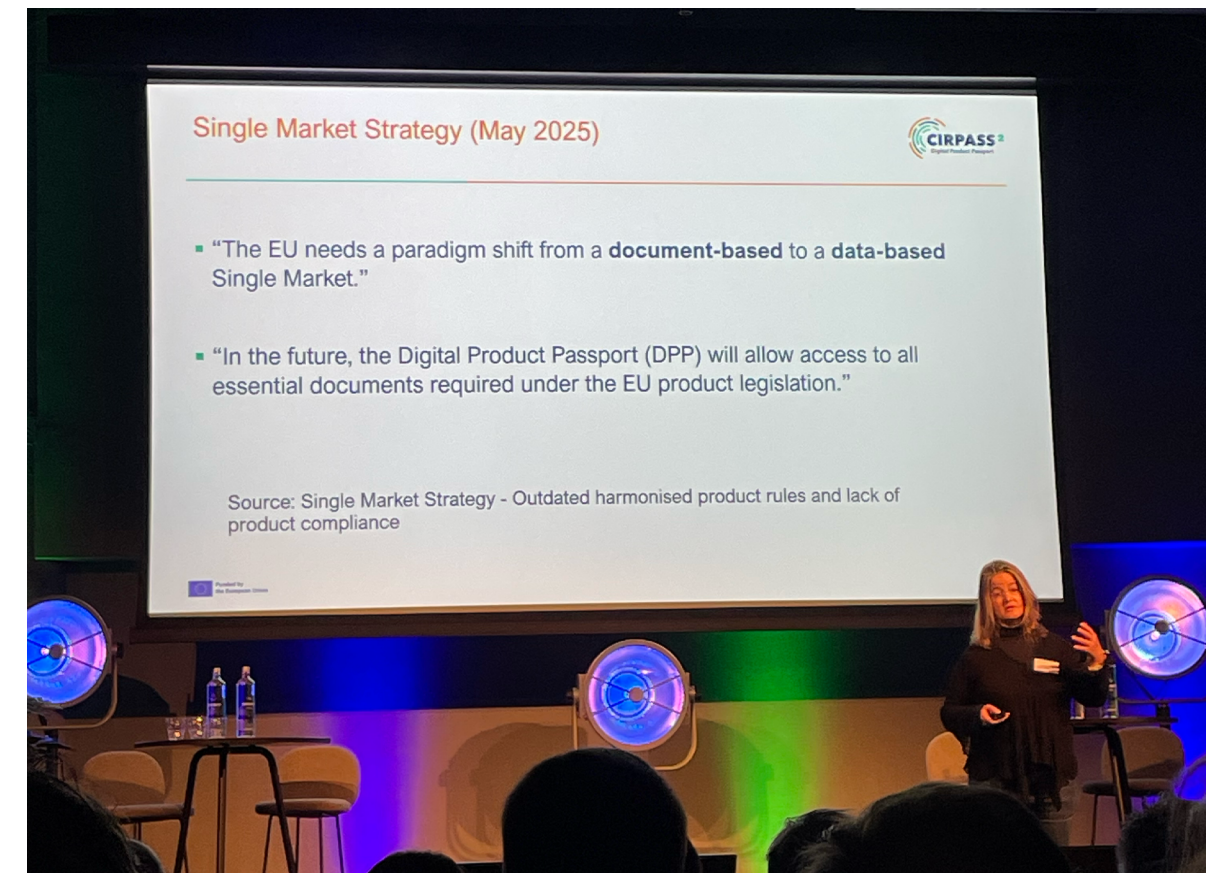
- LVMH's perspective introduced a **two-tier DPP model**:
  - A *compliance passport* for B2B and regulation.
  - A *consumer passport* emphasizing *ownership, authenticity, and storytelling*.
- This echoes your thesis argument that DPPs can enable *new consumer-facing value propositions*, distinct from technical reporting functions.

### 3. DPPs as Enablers of Service Ecosystems

- Speakers highlighted how DPP data can power **repair, resale, verification, or recall services**.
- The next step for circularity is **turning product data into usable consumer tools**—bridging the intention–action gap through convenience.

### 4. Economic Sustainability Over Pure Circularity

- Multiple panelists stressed: “It started with sustainability, now we talk about economy.”
- For consumer adoption, *functional and financial value* (ease, guarantees, resale potential) outweigh abstract environmental gains.



## 10.2 Interview guide - Expert interviews

### Semi-structured Interview Guide

Expert Interview: The Value of DPPs for Consumers – How to boost adoption.

#### 1. Introduction (5 min)

I'm researching how Digital Product Passports can create value for consumers and support circular practices. I'd love to learn from your experience about how you see this space evolving.

#### 2. Role & DPP Framing (5 min)

- Could you briefly introduce yourself and your role in your organization?
- From your perspective, how would you define a DPP?
- How relevant do you think the DPP is for consumers?

#### 3. Consumer Role & Barriers (10 min)

- In your view, what role does the consumer play in the circular economy?
- From your experience, what are the biggest challenges or barriers consumers face when engaging in circular behaviours — buying, using, repairing, reselling, or recycling products?
  - Probe: Are these mainly practical (e.g., time, effort, access), informational, motivational, or systemic?
- Which of these barriers do you think companies or product designers can realistically influence?

#### 4. DPP Leverage (10 min)

- Early DPP pilots haven't seen strong consumer engagement. Why do you think that is?
  - Optional: What might happen if consumers don't adopt or use DPPs?
- What value do you believe a DPP could deliver to consumers to change that?
- How could DPPs help overcome the barriers you mentioned earlier?
  - Probe: Through transparency, convenience, trust, incentives, etc.?
- Do you think consumers will interact directly with DPPs, or mainly through services and apps that use DPP data?

#### 5. Wrap up (5 min)

- What do you think needs to happen for consumers to actively participate in the circular economy?
- Are there any companies or initiatives that you think are setting a good example?
- Is there anything else you'd like to add or emphasize?

## 10.3 Expert interview - Researcher memos

### Expert Interview 1

Interviewee: Bas van der Pol

Organization: Tapppr

Position: CEO, Founder

Type of Actor: DPP Provider, Software Entrepreneur

#### Consumer role in DPP Ecosystem and relevance of the DPP

- Vision of the DPP: Conceptualized as a "tailored, personalized landing page" for products, moving beyond mere traceability to offer integrated services.
- Argues that the average consumer is not interested in traceability data or supply chain transparency. He notes that "consumers... don't really care about it" and asserts that "nobody's going to scan products in the store" to make sustainable choices.
- Defines the consumer's role not as a sustainability auditor, but as a value-driven user. He found that specific, sustainability-focused call-to-actions (CTAs) fail, whereas "marketing statements" (e.g., "Want to learn something?") or personal value promises (e.g., "Style this piece") perform way better and increase scan rates.
- Through features like "Lost & Found," the consumer's role shifts to data entry (registering ownership), which he views as "almost taking the customer hostage" because the value (finding a lost item) compels them to act.
- The consumer has an essential role in the CE. If all consumers would purchase durable goods, more can be reused, better repaired and recycled.

#### Consumer Barriers and value through DPP-enabled Services

- Compliance vs. Marketing: Currently, 85% of DPP activity is compliance-driven, but long-term value lies in marketing and brand-consumer relationship building.
- The strongest value case he currently sees, is asset recovery. By registering a product (e.g., a bag or kiteboard), the consumer gains "safety" against loss. This solves the barrier of financial and emotional damage from losing expensive gear.
- Acknowledges that the DPP exposes the "financial barrier" to sustainability. Buying durable goods is cheaper long-term, but many consumers lack the starting capital (e.g., the "Primark vs. durability" dilemma). This is something the DPP cannot solve.
- A kite school uses DPPs as way to track their equipment. That way they can keep an overview over how old the gear is (safety relevant) or if something is missing (economical)
- AI-Service Integration: The future of the DPP is an interface for AI to interpret technical errors (e.g., E5 error on a washing machine) for the user.

#### Other

- Product Service Systems will hardly work for products that are usually owned for longer (e.g. Furniture). Fundamentally is also strengthens the wrong behavior of fast consumption, instead of caring and consciously choosing.

## Expert Interview 2

Interviewee: Elise Vermeersch

Organization: Unitar

Position: Associate Programme Officer

Type of Actor: CE-RISE Project funded by Horizon (EU)

### Consumer role in DPP Ecosystem and relevance of the DPP

- DPP Definition: Viewed as an online tool that follows a product's entire lifecycle, allowing multiple actors to update data.
- Distinguishes between two groups: "those who just purchase because they want a product" and "conscious consumer[s]... who want to do good". The DPP, how it currently set up is relevant primarily to the latter. She hopes that once it gains traction within that group it will spread to the mainstream.
- The consumer's critical role is executing the "circular or non-circular decision" in purchase, use and end of use. Without the consumer deciding to repair or dispose properly, "it doesn't enter this loop".
- The consumer is a recipient of information, not an editor. Otherwise, consumers start having concerns again due to lacking "trustability".

### Consumer Barriers and value through DPP-enabled Services

- Friction Points: The primary barriers to circular behavior are price, lack of convenience in repair, and the established habit of frequent buying. Circular options take hours/days, while buying new takes 5 minutes, making it a difficult choice for average consumers.
- DPP-enabled Services can solve the friction of "scattered" information. Instead of searching online for hours, the DPP puts "all the information in one place", and Services could simplify it.
- DPP-enabled Services can also give advice what to do with a product. It can act as a decision tree: "considering that your product is... in this condition... it is bit better that you repair it or you simply dispose it off".
- Currently, repair is "too cumbersome." Services could help solves this by listing specific, local repairers or disposal points.
- High price discourages the purchase of more circular products. The DPP can help explain why this price is adequate.
- While B2C is the goal, initial viability depends on making the data useful for professional recyclers. Dependence on specialized service providers (like Circularise) to manage the technical and material data layers.

### Other

- Within the CE-Rise project they have conducted two surveys
  - o expectations and needs of consumers regarding DPPs
  - o Motivations and barriers to refurbished products focused on how they are communicated

## Expert Interview 3

Interviewee: Sjoerd Rogen

Organization: TNO, CoE DPP

Position: Consultant, Coordinator DPP

Type of Actor: CE-RISE Project funded by Horizon (EU)

### Consumer role in DPP Ecosystem and relevance of the DPP

- He is skeptical of consumer-driven adoption. He argues that "consumers will see it happen... go, 'Oh, that's neat.' And just be happy in 10 or 20 years when our economy is able to withstand external impacts".
- He warns that over-focusing on consumers is risky because if they perceive sustainability legislation as merely increasing prices, it could threaten the democratic support for such laws.
- While consumers help over the "initial innovation bump," they are not the mechanism for mass circularity. He states, "If you rely on the consumer value... to drive the change, then we're never going to get past, let's say, 10% adoption". Their actions are steered too much by what manufacturers supply. The consumer demand can only get us so far.
- Right now, for him it's most important to get the manufacturers to organize their supply chains and adopt the DPP. Without them doing it, the consumer would never get a DPP in their hand.

### Consumer Barriers and value through DPP-enabled Services

- Once established in the industry he sees a whole portfolio of new services that can emerge from the data publicly available.
- Envisions DPP data turning into "public infrastructure" that enables powerful meta-search engines (e.g., "search for all tires ever put on the market"), breaking the monopoly of single-store inventories. He says that this is the main asset of big marketplaces like bol.com, amazon and Zalando. The DPP data could help find products not per marketplace but over the whole web.
- He Suggests value in apps that manage personal inventory, offering wardrobe recommendations ("Have you considered this?") without relying on a single store.
- Solves the "greenwashing" trust barrier (e.g., the Shell carbon-neutral case) by providing verifiable data rather than marketing claims

### Other

- How can we balance the current investments that companies have to make to establish a DPP and the future profits that other companies make based on the data that is out there?
- Doesn't it feel unfair?
  - o My own take? In a linear economy maybe. But in a circular one? No! If we reflect how the DPP can straighten the disbalance of information that, to a certain extent, is intentional to make consumers buy a new product, it is rather recovering a disbalance that has been engrained for a long time.

## Expert Interview 4

Interviewee: Rik Holvoet

Organization: TrippleR

Position: CEO, Founder

Type of Actor: DPP Provider in the Mattress Industry

### Consumer role in DPP Ecosystem and relevance of the DPP

- To be relevant for the consumer, the DPP must reveal clear value for the consumer. The DPP is relevant only if it simplifies choice: like the energy label where a consumer buys an 'A' over a 'G' to save money, not necessarily to save the planet.
- Notes that for high-price items (e.g., mattresses), consumers buy based on brand trust. The DPP serves as a background verification of quality rather than the primary purchase driver.
- Industry-Specific Ecosystem: Tailoring DPP tools specifically for the mattress industry to solve unique material challenges. Up to 70% of mattress waste could be upcycled if recyclers knew the exact foam and textile compositions.
- Adoption fails if it adds a €20 premium that the consumer isn't willing to pay.

### Consumer Barriers and value through DPP-enabled Services

- Specific to mattresses, the DPP can offer services like "sanitizing" or ordering replacement covers, extending product life. This solves the barrier of assuming a dirty product must be discarded.
- Enables scanning a product in-store to compare specs and prices online instantly.
- Helps justify higher prices for sustainable goods by proving quality (e.g., A vs. G rating), addressing the barrier where "consumer is not willing to pay extra for sustainability" unless the value is clear.
- Using DPPs to trigger rejuvenation services (e.g., new covers, sanitization) to extend the "as new" experience

### Other

- He looks at the entire lifecycle of a mattress. He makes DPPs for brands but also works on software that the downstream actors can use to make use of the DPP. That way, he looks at the value of the entire system instead of only decreasing a compliance pain for the manufacturer. This way, he can also offer feedback loops to the manufacturer increasing the value they see in the DPP.
- Consumer Motivations: Consumers buy for "quality" and "brand trust" (e.g., Auping), with sustainability acting only as a "bonus".
- Regulatory Uncertainty: Industry is "playing football while drawing the lines," making it hard to commit to unfinalized standards.

## Expert Interview 5

Interviewee: Andres Alcayaga

Organization: ex-Wuppertal Institute

Position: Self-employed

Type of Actor: DPP Consultant

### Consumer role in DPP Ecosystem and relevance of the DPP

- DPP is a "digital container" bridging physical products to the virtual world.
- The DPP is a rare "one-to-one" communication channel between a brand and a specific customer.
- A major barrier to adoption; consumers will not install unique apps for every brand they own.
- He sees the consumer's role as a participant in a direct feedback loop with brands, allowing for "purchase analysis or use analysis". The value for manufacturers is more data about their consumers.
- Highlights the irrelevance of the DPP if usability is poor. Consumers "don't want to have a DPP for your or... an Android or iPhone app for the different products that you have at home".

### Consumer Barriers and value through DPP-enabled Services

- Cites "Jelly Bean" as an example where DPPs offer "collector cards, discounts, digital lookbook," moving beyond boring data to creating an "exclusive engaging experience".
- Scrolling through detailed data is too high a "transaction cost" for average shoppers.
  - o Proposes using LLMs to convert technical data into user-friendly "Do It Yourself" repair guidance
  - o Recommends "collector cards," gamification, and reward systems to keep consumers interacting with the DPP
- Proposes a "DPP wallet" for receipts and warranties, solving the hassle of keeping paper records and filling out long return forms and for organizing DPP in a world where they are abundant.
- Service can connect consumers directly to second-hand shops or neighbors to sell items, lowering the friction of resale.

### Other

- Technical basis is vital, but user-friendly, "circular-first" design is currently under-addressed
- In textiles, the desire for "newness" and fashion status competes directly with circular longevity
- Existing factories are so optimized for linear production that circularity currently feels like an efficiency loss

## Expert Interview 6

Interviewee: Laura Koedijk

Organization: Studio Anneloes,

Position: Sustainability Manager

Type of Actor: Textile Manufacturer

### Consumer role in DPP Ecosystem and relevance of the DPP

- Sustainability information limit engagement. A CTA regarding "how to wear this" (styling) was scanned significantly more than sustainability info.
  - o Current scan rates are ~2.4% without a specific call to action.
  - o Adding a "styling tips" hang-tag can increase scan rates from 2.4% to 5-7%
- Believes the consumer's role will eventually be mandated by the removal of physical labels. To ensure success, the industry must "almost force it upon consumers... [so] there will only be a QR code in the product".
- Acknowledges that for consumers, "does it look good on me?" and price are the top priorities, with responsible production ranking "third or maybe even fourth".

### Consumer Barriers and value through DPP-enabled Services

- Services could "link to resale platforms" so consumers can easily upload garments for sale, solving the barrier of effort required to list items on platforms like Vinted.
- Acknowledges that comparing "apples to apples" is difficult but hopes DPPs will eventually solve the barrier of confusing/misleading product comparisons.

### Other

- Launched textiles pilots in 2023 to gain experience ahead of 2027 mandates
- Moved from woven QR codes (too low-res) to printed unique QR codes in care labels
- Essential for tracking the specific history of a garment and allowing owner registration
- Successfully launching a DPP requires deep alignment between IT, Marketing, and Sustainability teams

## Expert Interview 7

Interviewee: Franziska Ziebold

Organization: European Commission

Position: Policy advisor, DG Grow

Type of Actor: Regulation introducer

### Consumer role in DPP Ecosystem and relevance of the DPP

- Envisions the consumer using the DPP to establish a "level playing field" for products, acting as an "orientation point" similar to a Nutri-score.
  - o Expects summary presentations (circles, grades, or "Nutri-score" styles) to make data digestible.
- The DPP changes the consumer's role from a passive owner to a steward. Knowing a product contains specific ingredients (e.g., batteries) might make them "more careful with it because to know that this battery may run out... it can create some physical harm".
  - o DPPs can be updated post-purchase with safety warnings if materials are discovered to be harmful

### Consumer Barriers and value through DPP-enabled Services

- DPPs can act like an "ISBN number" for all products (similar to Momox/Medimops for books), giving instant resale estimates and solving the friction of assessing value.
- Allows consumers to scan for specific concerns, such as allergens or "cancerous ingredients," enabling highly personalized safety checks for cosmetics.
- Solves the issue of physical manuals that are "10 pages that you have to roll up and you are hardly able to read," replacing them with searchable, digital instructions.
- Services can make the DPP information easy to understand instead of overloading.
- Recyclers become "more than charities" when high-quality ingredient data makes their business profitable.

### Other

- DG Grow Role: Responsible for the implementation of the DPP system (registry, identifiers, and economic operators).
  - o DG Grow works weekly with DG Environment and DG Connect to prevent siloed regulation.
  - o The DPP's core regulatory goal is to make Product A comparable to Product B using formalized data.
  - o The DPP helps track valuable raw materials (e.g., in electronics) to keep them within European recycling loops.
  - o Standardized data helps authorities identify and block cheap, harmful, or non-compliant imports

## Expert Interview 8

Interviewee: René Reich  
 Organization: TU Leuven  
 Position: Post-Doc Researcher  
 Type of Actor: Research

### Consumer role in DPP Ecosystem and relevance of the DPP

- Takes a paternalistic view, arguing consumers shouldn't necessarily have the choice to buy unsustainable goods.
- Argues the raw DPP is too complex for consumers ("consumer would spend I don't know half an hour just reading one product passport"). Therefore, the consumer's role is to interact with intermediaries or simplified scores, not the DPP itself.

### Consumer Barriers and value through DPP-enabled Services

- Moving from static data to dynamic services, such as a car or phone showing "where's the closest charging station" or repair shop when the battery is low.
- A "wallet" of digital twins could help with insurance claims solving the barrier of untracked household inventory.
- Proposes the DPP as a dynamic tool for managing the entire service life of a product .
- Critiques current DPPs for being static. A static passport fails to solve the barrier of "degrading information quality" (e.g., a phone's battery health changes over 7 years).

### Other

- The DPP is fundamentally a Business-to-Government reporting tool, despite being marketed to consumers.
- Consumers will likely never see the "real" DPP, only a simplified interpretation layer or score.
- Low-income consumers cannot be expected to choose "greener" products that cost more; standards must be mandatory
- Skepticism regarding whether the digital infrastructure for DPPs consumes more carbon than it saves
- The explicit mandate for a "Digital Product Passport" may be less effective than simply raising environmental standards and letting industry innovate solutions

## 10.4 NotebookLM prompt for barrier extraction

### Notebook LM Prompt:

Read, analyse and extract out of each of the 9 paper the data listed below.

1. Descriptive name of consumer barriers to circular consumption
2. Phase of barrier (Purchase, Use, post-use)
3. Specific product category of barrier (e.g. electronics, textile, durable goods, general)
4. Literature source of barrier
5. 1-3 referenced empirical cases for barrier

add a new row for each barrier. Even though new barriers might overlap with previous ones, do not merge them.

Collect the data one paper at the time

If there is no specific Consumer Barrier included, make sure to include the systemic barrier Organizational/producer Barrier, policy/regulatory, other observation that results from the source.

Make sure to review all nine papers.

## 10.5 Literature review - Barrier cluster table

NO	Descriptive name of Consumer Barriers to circular consumption	Consumption Phase	Product category	Review Paper Reference	Backward snowballing: Empirical Cases	Barrier Cluster
1	The user lacks confidence in his or her ability to perform the care activity	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	Lack of information about caring and repairing a product
2	User's concerns about the irreversibility of the care method	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	Lack of information about caring and repairing a product
3	User's concerns about the outcome endurance and future damages	Use	General (Shopping products)	Ali2018.pdf	Ackemann's; Ackemann et al.'s	Inferior Quality and Performance concerns
4	User's assumption that the product cannot be cared of	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	Lack of information about caring and repairing a product
5	The user does not have the time required to care properly	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	High time demand and physical/mental effort
6	The user does not have the required knowledge for the care activity	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	Lack of information about caring and repairing a product
7	The required to effort to care and repair is high	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	High time demand and physical/mental effort
8	The upgrade process is difficult to execute	Use	General	Ali2018.pdf	Ükü et al.'s	High time demand and physical/mental effort
9	Inaccessibility to original spare parts, materials, and methods required to exhibit care behavior	Use	General	Ali2018.pdf	Ackemann's; Ackemann et al.'s	Lack of repair infrastructure
10	Identity discrepancy (One does not identify as a second-hand shopper, often associated with clothing)	Purchase	Textile	Frahm2024.pdf	Frahm2024.pdf	Uncategorized
11	Hygiene concerns (Specifically components in contact with food or worn on certain body areas, e.g. kitchenware or sportswear/underwear)	Purchase	General	Frahm2024.pdf	Frahm2024.pdf	Authenticity and hygiene concerns
12	Consumers imagine how the previous owner used the product when deciding on their attitude towards buying a second-hand product	Purchase	General	Frahm2024.pdf	Frahm2024.pdf	Authenticity and hygiene concerns
13	Consumers often do not prefer products made from recycled materials (despite positive attitudes)	Purchase	General	Polyports2022.pdf	Park & Lin (2020)	Limited offer of circular products
14	High up-front costs associated with circular offers compared to linear equivalents (Customer perspective)	Purchase	Durable goods	RodriguesdaSilva2024.pdf	Grafström and Aasma (2021)	High initial cost
15	Service affordability gap (Procuring repair/refurbishing is more expensive than buying new)	Use/Post-use	General	RodriguesdaSilva2024.pdf	Jaeger-Erben et al. (2021)	High cost of Repairs
16	Lack of offer and information availability in the repair market	Use	General	RodriguesdaSilva2024.pdf	Güsser-Fachbach et al. (2023); Reimann (2024)	Lack of information about caring and repairing a product
17	Insufficient trust in the repair service efficacy	Use	General	RodriguesdaSilva2024.pdf	Güsser-Fachbach et al. (2023); Reimann (2024)	Lack of information about caring and repairing a product
18	High costs (in the repair market)	Use	General	RodriguesdaSilva2024.pdf	Güsser-Fachbach et al. (2023); Reimann (2024)	High cost of Repairs
19	Non-existing cost transparency (in the repair market)	Use	General	RodriguesdaSilva2024.pdf	Güsser-Fachbach et al. (2023); Reimann (2024)	High cost of Repairs
20	Hygiene concerns hinder sustainable fashion product transition	Purchase/Use	Textile	RodriguesdaSilva2024.pdf	de Aguiar Hugo et al. (2023)	Authenticity and hygiene concerns
21	Low acceptance for circular economy-based models, such as second-hand markets, and sharing systems	Purchase/Use	General	RodriguesdaSilva2024.pdf	Ackemann et al. (2018); Grafström and Aasma (2021)	Limited offer of circular products
22	Lack of consumer enthusiasm	General	General	RodriguesdaSilva2024.pdf	Ackemann et al. (2018); Grafström and Aasma (2021)	Lack of awareness
23	Insufficient accessibility to spare parts and tools	Use	General	RodriguesdaSilva2024.pdf	Laitala et al. (2021)	Lack of repair infrastructure
24	Rapid technological advance (constantly launching products, forcing buying newer products)	Use/Purchase	Electronics	RodriguesdaSilva2024.pdf	Maitre-Ekem and Dalhammar (2019)	Perceived product obsolescence
25	Poor product assortment (in reuse markets)	Purchase	General	RodriguesdaSilva2024.pdf	Bocken et al. (2022)	Limited offer of circular products
26	Risk aversion (to second-hand consumption)	Purchase	General	RodriguesdaSilva2024.pdf	Gullstrand Edbring et al. (2016); Grafström and Aasma (2021)	Inferior Quality and Performance concerns
27	Unfamiliarity with the concept (of second-hand consumption)	Purchase	General	RodriguesdaSilva2024.pdf	Gullstrand Edbring et al. (2016); Grafström and Aasma (2021)	Lack of awareness
28	Greenwashing undermines trust in sustainable claims	Purchase	General	RodriguesdaSilva2024.pdf	Clougherty et al. (2023)	Lack of trustworthy information
29	Lack of information about longevity and reparability of a product	Purchase	General	RodriguesdaSilva2024.pdf	Jensen et al. (2021)	Lack of trustworthy information
30	Trustworthy information about condition/performance of second-hand products	Purchase	General	Frahm2024.pdf	Slevfors (2019)	Lack of trustworthy information
31	Lack of information about how the product was produced	Purchase	General	RodriguesdaSilva2024.pdf	Jensen et al. (2021)	Lack of trustworthy information
32	Shortage of skilled workers providing repair services (Organizational/Systemic Barrier)	Use	General	RodriguesdaSilva2024.pdf	Güsser-Fachbach et al. (2023)	Lack of repair infrastructure
33	High travel times to reach a repair provider	Use	General	RodriguesdaSilva2024.pdf	Güsser-Fachbach et al. (2023)	High time demand and physical/mental effort
34	Lack of information about how to recycle certain products or access other waste collection points (EoL product holder perspective)	Post-use	General	RodriguesdaSilva2024.pdf	Kharola et al. (2022)	Lack of information how dispose of a product correctly
35	Inconsistency and lack in waste collection infrastructure and technology (Policy/Systemic Barrier)	Post-use	General	RodriguesdaSilva2024.pdf	Kharola et al. (2022)	Limited waste-collection infrastructure
36	Lack of feedback mechanism (regarding products put in for recycling)	Post-use	General	RodriguesdaSilva2024.pdf	Kharola et al. (2022)	Lack of clear personal benefit
37	Low quality (Perceived quality of the circular offer)	General	General	RodriguesdaSilva2024.pdf	Gomes et al. (2022); Colasante and D'Adamo (2021)	Inferior Quality and Performance concerns
38	Inconvenience (Derived from certain products and services e.g. long repair times)	Use	General	RodriguesdaSilva2024.pdf	Chamley et al. (2022); Güsser-Fachbach et al. (2023)	High time demand and physical/mental effort
39	Inadequate infrastructure (E.g. lack of good containers for waste collection) (Systemic/Organizational Barrier)	Post-use	General	RodriguesdaSilva2024.pdf	Kharola et al. (2022)	Limited waste-collection infrastructure
40	Forced upgrades/Obsolescence (Software becomes too heavy, feeling obliged to buy new)	Use/Purchase	Electronics	RodriguesdaSilva2024.pdf	Gomes et al. (2022)	Perceived product obsolescence
41	Rooted habits (Linear consumption habits)	General	General	RodriguesdaSilva2024.pdf	RodriguesdaSilva2024.pdf	Uncategorized
42	Lack of awareness of circular practices and their benefits	General	General	RodriguesdaSilva2024.pdf	Colasante and D'Adamo (2021)	Lack of awareness
43	Limited discourse/Social norms amongst consumers	General	General	RodriguesdaSilva2024.pdf	do Couto et al. (2021); Colasante and D'Adamo (2021)	Lack of awareness
44	Deficiencies in information	General	General	Salazar Serra2025.pdf	Salazar Serra2025.pdf	Lack of trustworthy information
45	Financial perceptions	General	General	Salazar Serra2025.pdf	Salazar Serra2025.pdf	High initial cost
46	Financial considerations	General	General	Salazar Serra2025.pdf	Salazar Serra2025.pdf	High initial cost
47	Absence of subsidies for circular business models	General	General	Salazar Serra2025.pdf	Munaro and Tavares	Limited offer of circular products
48	Conceptual misunderstandings (regarding CE practices)	General	General	Salazar Serra2025.pdf	Gonella et al. (2024)	Lack of awareness
49	Educational disparities (regarding CE practices)	General	General	Salazar Serra2025.pdf	Gonella et al. (2024)	Lack of awareness
50	Misperceptions of costs and benefits (regarding CE practices)	General	General	Salazar Serra2025.pdf	Gonella et al. (2024)	Lack of clear personal benefit
51	Financial trade-offs (Significantly affect the acceptance of remanufactured and reusable products)	Purchase	General	Salazar Serra2025.pdf	Salazar Serra2025.pdf	Lack of clear personal benefit
52	Perceived performance risk (Significantly affect the acceptance of remanufactured and reusable products)	Purchase	General	Salazar Serra2025.pdf	Salazar Serra2025.pdf	Inferior Quality and Performance concerns
53	Perceived product quality (Significantly affect the acceptance of remanufactured and reusable products)	Purchase	General	Salazar Serra2025.pdf	Salazar Serra2025.pdf	Inferior Quality and Performance concerns
54	High prices (Perceived as an important barrier)	Purchase	Textile	Schiariol2024.pdf	Pereira et al. (2021); Kusá and Umlínová (2020)	High initial cost
55	Skepticism about used goods	General	Textile	Schiariol2024.pdf	Schiariol2024.pdf	Inferior Quality and Performance concerns
56	Lack of knowledge of circular practices	General	Textile	Schiariol2024.pdf	Schiariol2024.pdf	Lack of awareness
57	Lack of availability of circular solutions	Purchase/General	Textile	Schiariol2024.pdf	Schiariol2024.pdf	Limited offer of circular products
58	Efforts to access circular products/service (Main barrier to sustainable consumption)	Purchase/Use	Textile	Schiariol2024.pdf	Schiariol2024.pdf	High time demand and physical/mental effort
59	Sustainable garments are commonly associated with higher prices compared to traditional garments	Purchase	Textile	Schiariol2024.pdf	Cairns et al. (2022); Harris et al. (2016)	High initial cost
60	Perceived deficiencies in cost benefits	Purchase	Textile	Schiariol2024.pdf	Perry and Chung (2016)	Lack of clear personal benefit
61	Perceived financial risks associated with sustainable fashion purchases	Purchase	Textile	Schiariol2024.pdf	Han and Chung (2014)	High initial cost

NO	Descriptive name of Consumer Barriers to circular consumption	Consumption Phase	Product category	Review Paper Reference	Backward snowballing: Empirical Cases	Barrier Cluster
62	Sustainable fashion choices and lifestyles are perceived as expensive	General	Textile	Schiariol2024.pdf	Puspita and Chae (2021); Alghani and Al-Dabbagh (2020)	High initial cost
63	Social pressure leads consumers to regularly update and vary their wardrobe (wearing the same items multiple times is not socially accepted)	Use	Textile	Schiariol2024.pdf	Harris et al. (2016)	Perceived product obsolescence
64	Availability barriers at a physical level (actual availability of services)	Post-use	General	Schiariol2024.pdf	Schiariol2024.pdf	Limited offer of circular products
65	Availability barriers on a cognitive level (knowledge of sustainable disposal alternatives and where to find them)	Post-use	General	Schiariol2024.pdf	Schiariol2024.pdf	Lack of awareness
66	Reverse logistics systems are often hampered by hibernation	Storage/Post-use	Electronics	Tasbirul Islam2021.pdf	Singh et al. (2018)	Product Hibernation
67	Keeping household items can be divided into two main categories: disused/broken and abandoned (Over time, value dissipates, more troublesome than recycling)	Storage/Post-use	General	Tasbirul Islam2021.pdf	Casey et al. (2019)	Product Hibernation
68	Information leakage (Critical barrier to recycling)	Post-use	Electronics	Tasbirul Islam2021.pdf	Liu et al. (2019); Bai et al. (2018)	Privacy concerns
69	Incentive issues (Must be considered for recycling system)	Post-use	Electronics	Tasbirul Islam2021.pdf	Liu et al. (2019); Bai et al. (2018)	Lack of clear personal benefit
70	Convenience issues (Must be considered for recycling system)	Post-use	Electronics	Tasbirul Islam2021.pdf	Liu et al. (2019); Bai et al. (2018)	High time demand and physical/mental effort
71	Inconvenience of recycling (Negatively correlated to recycling behavioral intention)	Post-use	General	Tasbirul Islam2021.pdf	Thi Thu Nguyen et al. (2018)	High time demand and physical/mental effort
72	Lack of formal collection channels (Systemic/Organizational Barrier for Mobile Phones (MPs))	Post-use	Electronics	Tasbirul Islam2021.pdf	Sartha et al. (2015)	Limited waste-collection infrastructure
73	Price of returned product (Main reason for not recycling waste MPs)	Post-use	Electronics	Tasbirul Islam2021.pdf	Sartha et al. (2015)	Lack of information how dispose of a product correctly
74	Low public awareness of collection responsibility	Post-use	General	Tasbirul Islam2021.pdf	Tan et al. (2018)	Lack of awareness
75	Insufficient promotion of formal collection (Organizational/Systemic Barrier)	Post-use	General	Tasbirul Islam2021.pdf	Tan et al. (2018)	Lack of information how dispose of a product correctly
76	Cost of recycling (The most critical reason for failure of efficient recycling system)	Post-use	General	Tasbirul Islam2021.pdf	Fraige et al. (2012)	Lack of clear personal benefit
77	Lack of recycling plants (Organizational/Systemic Barrier)	Post-use	General	Tasbirul Islam2021.pdf	Fraige et al. (2012)	Limited waste-collection infrastructure
78	Lack of awareness (Main barrier to recycling system)	Post-use	General	Tasbirul Islam2021.pdf	Fraige et al. (2012)	Lack of awareness
79	Lack of public trust regarding recycled equipment	Purchase/Post-use	Electronics	Tasbirul Islam2021.pdf	Fraige et al. (2012)	Inferior Quality and Performance concerns
80	Consumers' lack of awareness regarding the appropriate destination of e-waste ("do not know where to send waste")	Post-use	Electronics	Tasbirul Islam2021.pdf	Gu et al. (2017)	Lack of awareness
81	Unexpected privacy disclosure (Critical barrier to recycling)	Post-use	Electronics	Tasbirul Islam2021.pdf	Gu et al. (2017)	Privacy concerns
82	Troublesome procedure (Critical barrier to recycling)	Post-use	Electronics	Tasbirul Islam2021.pdf	Gu et al. (2017)	High time demand and physical/mental effort
83	Need for locale-specific studies to understand the dynamic behavior of e-waste disposal and awareness across nations (Research Gap Observation)	General	Electronics	Tasbirul Islam2021.pdf	Borthakur and Govind (2019)	Lack of awareness
84	Consumers' eco-friendly behavior remains until the product purchase, but is diminished in the use-phase, and at the EoL phase (Attitude-Behavior Gap)	Use/Post-use	General	Tasbirul Islam2021.pdf	Echegaray and Hansstein (2017)	Lack of awareness
85	E-waste is not seen as a recyclable item compared to other items (paper, plastics)	Post-use	Electronics	Tasbirul Islam2021.pdf	Echegaray and Hansstein (2017)	Lack of information how dispose of a product correctly
86	Consumers feel reluctant to dispose of e-waste through formal collection and recycling channels due to the considerable amount of time involved	Post-use	Electronics	Tasbirul Islam2021.pdf	Wang et al. (2011)	High time demand and physical/mental effort
87	Lack of environmental beliefs/awareness	General	General	Zimmermann2024.pdf	Ali and Choe (2022); Ta et al. (2022)	Lack of awareness
88	Lack of information on circularity benefits	General	General	Zimmermann2024.pdf	Aredondo-Soto et al. (2022); Sjösen et al. (2019)	Lack of clear personal benefit
89	Lack of environmental literacy (encompasses knowledge and awareness)	General	General	Zimmermann2024.pdf	Allison et al. (2022); Boesen et al. (2019)	Lack of awareness
90	Lack of clear financial benefits	General/Purchase	General	Zimmermann2024.pdf	Aredondo-Soto et al. (2022); Uriarte-Ruiz (2022)	Lack of clear personal benefit
91	High costs for battery replacement (a challenge that has to be faced to reduce environmental impact)	Use	Electronics	Zimmermann2024.pdf	Guo and Huang (2023)	High cost of Repairs
92	Skepticism or distrust towards the performance and durability of repaired, reused, or refurbished products	Purchase	General	Zimmermann2024.pdf	Boyer et al. (2021a,b); Cole et al. (2019)	Inferior Quality and Performance concerns
93	Hibernation (tendency of people to keep old products at home)	Post-use	Electronics	Zimmermann2024.pdf	Kursu et al. (2020); Sabbaghi and Behdad (2018)	Product Hibernation
94	Lack of knowledge about correct disposal	Post-use	General	Zimmermann2024.pdf	Kursu et al. (2020); Shevchenko et al. (2019)	Lack of information how dispose of a product correctly
95	Desire to have a spare product (causes hibernation)	Storage	General	Zimmermann2024.pdf	Wibowo et al. (2022)	Product Hibernation
96	Ease of storing small products at home (causes hibernation)	Storage	General	Zimmermann2024.pdf	Wibowo et al. (2022)	Product Hibernation
97	Premature replace of smartphones that are still in working conditions	Purchase/Use	Electronics	Zimmermann2024.pdf	Uriarte-Ruiz (2022)	Perceived product obsolescence
98	Feeling of exclusion for not having a "new" model (hinders purchase of second-hand products)	Purchase	General	Zimmermann2024.pdf	Uriarte-Ruiz (2022)	Thrill of Newness
99	Unavailability or lack of information on the appropriate disposal methods	Post-use	General	Zimmermann2024.pdf	Atlasan et al. (2017); Botelho et al. (2016)	Lack of information how dispose of a product correctly
100	Low service level or long time to the service (e.g. repair)	Use	General	Zimmermann2024.pdf	Amend et al. (2022); Chamley et al. (2022)	Lack of repair infrastructure
101	Lack of competence and skills (to repair, refurbish, repurpose)	Use/Post-use	General	Zimmermann2024.pdf	McQueen et al. (2022); Nazil (2021)	Lack of information about caring and repairing a product
102	Lack of knowledge of consumers in actions such as decisions to extend the life of a product (Research Gap/Barrier)	Use	General	vidal 2023.pdf	vidal 2023.pdf	Lack of information about caring and repairing a product
103	Technological obsolescence means consumers feel compelled to buy new products	Purchase	Electronics	Zimmermann2024.pdf	Echegaray (2016)	Perceived product obsolescence
104	A persistent desire for new products, preferring to be the first owner, acts as a barrier	Purchase	General	RodriguesdaSilva2024.pdf	Jaeger-Erben et al. (2021)	Thrill of Newness
105	Risk of non-authentic second hand product purchase	Purchase	Textile	Frahm2024.pdf		Authenticity and hygiene concerns
106	High price for new, repairable products	Purchase	General	Zimmermann2024.pdf		High initial cost

## 10.6 Consumer survey questionnaire

### SECRID Customer Survey

<b>Goal</b>	1. Recruitment of 30 min Interviews
	2. Identify which consumer barriers matter most to SECRID customers, to focus on when developing after-sale service propositions.
<b>Platform</b>	Qualtrics
<b>Target completions</b>	150
<b>Completion time</b>	4 mins

#### Section 0 - Introduction

At Secrid, we're improving how information is connected to every product.

Together with the TU Delft, we're exploring how we can better support customers to make conscious choices, care for, repair, resell, and recycle their wallets.

This short 4-minute survey helps us understand what matters most to you. Your answers are anonymous, however if you'd like to help us even more, you can join a follow-up conversation.

Thanks for your help!

#### Section 1 - Context & segmentation

Q1. What is your Year of Birth?

*Question type: free text field*

*Reasoning: Provides simple segmentation by consumer age.*

Q2. How would you describe yourself?

*Question type: single choice.*

- Female
- Male
- Prefer to self-describe
- Prefer not to say

*Reasoning: Provides simple segmentation by consumer gender.*

Q3. In which country to you live?

*Question type: Country selection*

*Reasoning: Provides simple segmentation by consumer residency.*

Q4. How long have you owned a Secrid Product?

*Question type: single choice.*

- A. Less than 1 year
- B. 1–3 years

C. 3–5 years

D. More than 5 years

*Reasoning: Provides simple segmentation by Product ownership.*

#### Section 2 – Purchase Motivation

Q5. To what extent do you agree with the statements below

*Question type: 5-point Likert scale*

1 Strongly disagree 2 Disagree 3 Neither Agree nor Disagree 4 Agree 5 Strongly agree

- a. I chose Secrid because it feels like a more sustainable or responsible product
- b. I chose Secrid because it's well-made, repairable, and built to last.
- c. I chose Secrid because it's compact and practical for everyday use.
- d. I chose Secrid because I like its design and style.

*Reasoning: Segments SECRID's customer base in environmentally and functionally motivated consumers. Important to understand potential skew of people included and which barriers matter most to who.*

#### Section 3 - Barrier resonance

Choosing a product that fits your needs AND is good for the planet can be tricky. Let's talk about why it's hard to buy, use, or discard products sustainably.

Q6. Which of the following statements resonates most with you?

*Question type: Multiple choice (Select up to three)*

- A. It takes too much time or effort to find sustainable products.
- B. I don't believe that my own action has impact on the planet.
- C. I doubt the quality, cleanliness, or originality of secondhand products.
- D. I don't know how to repair a broken product myself.
- E. Repair services are hard to find.
- F. I don't see clear financial benefits of more sustainable products.
- G. I don't know the right way to care for my products.
- H. I don't know where to recycle used products.
- I. I don't know the value of a product when selling it secondhand.
- J. Selling used products feels like too much effort.

*K. I don't trust the information about how sustainable the product is*

Reasoning: Respondents choose which barriers are most relevant to them. Data identifies the top 2–3 pain points among existing customers across all consumer roles. This allows prioritization on which barriers to focus on and categorization of which barriers matter to which segment.

#### Section 4 - Motivation & value triggers

Q7. What would make you more likely to repair your wallet?

*Question type: Multiple choice (Select up to three)*

- A. If I knew where to repair it.
- B. If I knew how much warranty I have left.
- C. If I saw the financial benefits of repairs.
- D. If SECRID instructed me how to do it myself.
- E. If I knew it had a real environmental impact.
- F. If I would not have to fill out a long repair form.
- G. Because I lost the proof of purchase (receipt).

Reasoning: Reveals what incentives or value propositions could overcome the identified barriers — direct design input for future services.

Q8. What would make you more likely to resell your wallet?

*Question type: Multiple choice (Select up to three)*

- A. If I knew the resale value of my product.
- B. If I had a Certificate of Authenticity.
- C. If it would take less effort to list it on a secondhand platform.
- D. If SECRID would offer a take-back program.
- E. If others around me did it too.

Reasoning: Reveals what incentives or value propositions could overcome the identified barriers — direct design input for future services.

Q9. What would make you more likely to recycle your wallet?

*Question type: Multiple choice (Select up to three)*

- A. If SECRID would instruct me how to do it.
- B. If SECRID would take care of it themselves.
- C. If I knew a place where to bring it.

D. If I got something in return (e.g. discount).

E. If I knew it had a real environmental impact.

Reasoning: Reveals what incentives or value propositions could overcome the identified barriers — direct design input for future services.

#### Section 5 – Information Requirements

*We also want to make it easier to find the right information when choosing a Secrid wallet. Imagine you're looking at this product on our website*

Q10. What information do you need when purchasing a SECRID wallet to make an informed decision?

*Question type: Multiple choice*

- A. Basic Product Description (Size, Weight, Functional Features).
- B. Materials the product is made of.
- C. Locations the materials come from.
- D. How the people that produce the product are treated.
- E. Care instructions for the product.
- F. How well repairable a product is.
- G. The environmental impact of the product (CO2 Emissions, Water Usage).
- H. The product warranty.

Reasoning: Basic demographics allows to explore variation (e.g., younger vs. older consumers valuing resale differently) and ensure diversity in interview sampling. Mean Customer age at SECRID is known to be around 40.

#### Section 6 - Interview recruitment

Q11. Would you be open to a short 30-minute conversation about your experiences and ideas?

*Question type: Single choice + conditional field*

- Yes, I'm interested → [Email field and preferred time question appears]
- No, thank you.

#### Section 7 - Closing screen

Text: Thank you for sharing your perspective! Your input helps Secrid and TU Delft make caring, repairing, and reusing products easier. We'll contact a few participants soon for short follow-up conversations.

## 10.7 Ideation workshop agenda and expert feedback

### Workshop Agenda

#### 05' | Warm-Up

The future is circular. Draw 8 circles on a piece of paper. Within **2 minutes** come up scribbles that incorporate the circle.

*Tip: things that include a circle are ideal for that*

#### 10' | Good to know: **Consumer & Barriers to Circular Consumption**

#### 15' | Silent Brain Dumping + Quick Pitches

You have learned about Barriers that consumers face to purchase, use and get rid of products in a circular manner.

1. Make use of your DPP Knowledge and dump your ideas how it could solve the barriers. You get **7 Minutes** to come up with as many Ideas as possible.
2. Pitch your Idea in **one sentence** and hang it at the board.

#### 05' | Good to know: **DPP Features according to the ESPR**

#### 25' | Group Ideation: Barrier and DPP Feature Card

1. Take 2-3 Barrier Cards.
2. Ideate how these barriers can be solved through specific features of the DPP
3. After 7 minutes, stick your ideas to the corresponding Barrier and pass it along.
4. Add-on, modify or detail out the idea that you receive on the Barrier Cards
5. Use the remaining time to present and hang the ideas on the board.

#### 15' | Prioritization

1. you get 5 Stickers, mark the Concepts that you are most excited about.
- OR
1. Evaluate Consumer Value x Feasibility (now)
  2. DONE! Thaaanks 🎉

Meeting Ludwig Maul

Ex Senior Innovation Coach from Bosch Power Tools

Professor for Innovation and Change Management

20.10.2025

General Feedback:

- Related problem: how do we nudge people into not ordering paper instructions? (value and experience)
- If you focus on convenience barriers and financial motivators, you increase the chances to consume circular for everyone, and not only for consumers that are environmentally aware.

Feedback Barrier Cards:

- Good method to dissect the problem. By supplying smaller chunks of the problem, you make it actionable and reduce the mental barrier to ideate solutions to it.
- Barriers are too concrete and too formally written for ideation workshops. If you want to facilitate idea generation with the barriers, translate them into relatable POV-statements; this makes the participant create empathy with the barrier.
- There are too many barriers; participants get lost. Cluster them after action and phase to make them less specific and less complicated.
- If you want to look at products in general, discard the barriers that are specific to a product category.
- The Job to be Done can be inspiring but also directive. Sketch a situation that is desirable but not too concrete.

Feedback DPP Feature Cards:

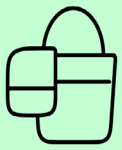
- Uncertain Technology looking for an uncertain problem... This is a good way of how you can reduce uncertainty about what the DPP aims to be. Remember to state that you don't want to redesign the DPP but whatever builds upon it.

Feedback Workshop agenda:

- 1.5 hours is very tight. You need to timebox well.
- Make use of both silent as well as group ideation methods. Silent braindumping is good to start and width. Group ideation with cards is good to increase depth.
- Maybe you can ask them to prioritize the barriers they feel are most relevant.
- A few dots help you understand which direction you want to go and what people feel is most feasible.

## 10.8 Consumer pain and DPP-feature cards

Use




**Extra effort to take care products.**  
*I struggle to care about my product, because...*

- ...I don't know how to do it the correct way.
- ...I fear to break the product.
- ...I lost the instructions on how to do it.
- ...I don't feel like doing extra work, if I change the product frequently anyway.

Care the right way so that products last

Use




**Low confidence in self-repair**  
*I struggle to self-repair a broken product, because...*

- ...I don't know how to do it.
- ...I don't have the right tools.
- ...I fear to loose my warranty.
- ...I fear to break the product even more.

Fix broken products myself safely

Use




**Repair service are hard to access**  
*I struggle to repair broken products, because...*

- ...I often don't know that repairs are possible.
- ...I can not find the right repair service.
- ...I often think that repairs are too expensive.
- ...I feel like repairs take too long.
- ...I do not know if I still have warranty.

Choose repair services confidently

Purchase

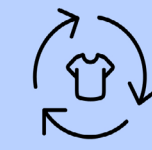


**Effort in buying new (circular) product**  
*I struggle to find and compare circular products, because...*

- ... I don't have information on how circular it is.
- ... I don't trust claims because of greenwashing.
- ... I do not know where to buy them.
- ... It takes too much time.
- ... I don't understand what circular means to me.

Compare products easily & confidently

Purchase




**Doubt in not-new products**  
*I struggle to purchase a not-new product, because...*

- ...it is less reliable/durable because its used.
- ...it takes extensive negotiation/communication.
- ...it has hidden defects or is not clean.
- ...I don't trust the seller and the information.
- ...I don't know about the originality of the product.

Purchase used products confidently

Post-use

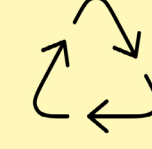


**Effort reselling a product**  
*I struggle to sell a product, because...*

- ...I do not know what the remaining value is.
- ...have to prepare and clean the product before.
- ...monitor and maintain the selling process.
- ...have to negotiate prices with buyers.

Recover value easily

Post-use




**Unclear product disposal**  
*I struggle to get rid of my product correctly, because...*

- ...I don't know how much value it still has.
- ...I don't know where I can sell/donate/discard it.
- ...I don't know the correct way to dispose it.
- ...I think recyclers are too far away.

Choose the correct disposal confidently

Purchase, use, post-use




**Unclear financial benefit to be circular**  
*I struggle to see clear financial benefit to purchase a circular product, because...*

- ... they are often more expensive.
- ... I don't have information how long they last.
- ... I don't know about its lifetime savings.
- ... I don't understand the resale value.
- ... I can not compare the the value easily.

Know that a circular product is worth it

Purchase, use, post-use




**Unclear environmental benefits**

I struggle to see environmental benefits from circular choices, because...

- ...I don't know about the products impact.
- ...I don't know about the impact of circular action.
- ...I don't know what the impact means in context.
- ...environmental impact feels irrelevant small.

See and state my environmental impact

DPP FEATURE



**Performance Information**


Provides verified performance data like efficiency, durability, or functional metrics beyond marketing claims.

Product Benchmarking Performance Trust

Product Comparison

ESPR Annex III

DPP FEATURE



**Product Scores**


The DPP shows reparability, durability, and environmental scores, visualizing a product's sustainability performance.

Consumer Awareness Product Benchmarking

Product Comparison

ESPR Article 7

DPP FEATURE




**Pre-Purchase Accessibility**

Consumers can easily access essential product information before buying, supporting informed and sustainable choices.

Informed Purchase Product Comparison

ESPR Article 9 (2e)

DPP FEATURE



**Personal Data with Consent**


Consumers can opt to store personal data (e.g., ownership) within the DPP for tailored services.

Warranty Tracking Ownership History

Personal Product Inventory Personalization

ESPR Article 10(1e)

DPP FEATURE



**Controlled Edit Rights**


Only authorized actors can update data, ensuring integrity while allowing lifecycle collaboration between stakeholders.

Chain of Custody Verified Repairs

Trust in Product Condition

ESPR Article 9 (2g-h)

DPP FEATURE



**Digital Use & Repair Guides**

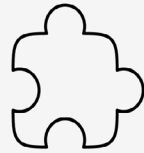
Contains manuals, repair instructions, and safe disposal guidelines for responsible product use and circularity.

Self-Repair AI-Manuals Nearby Repair

Nearby disposal recommendations

ESPR Annex III

DPP FEATURE



**Interoperable**


The DPP aims to be interoperable on technical, semantic, and organizational levels, allowing data sharing and comparisons across product groups.

3rd Party Service Data Ecosystem

Product Comparison

ESPR Article 11

DPP FEATURE



**Data Carrier Access**


A scannable code or chip on the product, packaging or accompanied documents connects users directly to the product's digital passport.

Smart-Packaging Connected-Product

Informed Purchase

ESPR Article 10 (1b)

DPP FEATURE



**Lifecycle Linking**


The DPP stays attached to a product's unique identifier through resale, refurbishment, and remanufacturing, recording its entire journey.

Resale Value Tracking Ownership History

Circular Traceability Product Authenticity

ESPR Article 10 (1a, 3)

DPP FEATURE



**Lifetime Availability**

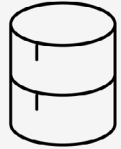
The DPP remains active and accessible for the full lifespan of the product, regardless of ownership or manufacturer changes.

After-Sales Support Long-Term Trust

Lifecycle Traceability

ESPR Article 9 (1), 11

DPP FEATURE



**Structured & Open Data**


DPP data follows open standards and machine-readable formats that make it searchable and compatible across systems.

3rd Party Services Data Transparency

Automation

ESPR Article 10 (1d)

DPP FEATURE



**Verified & Up-to-date Information**

Data is decentralized, continuously updated, and verified by a market authority to ensure reliability and authenticity across the value chain.

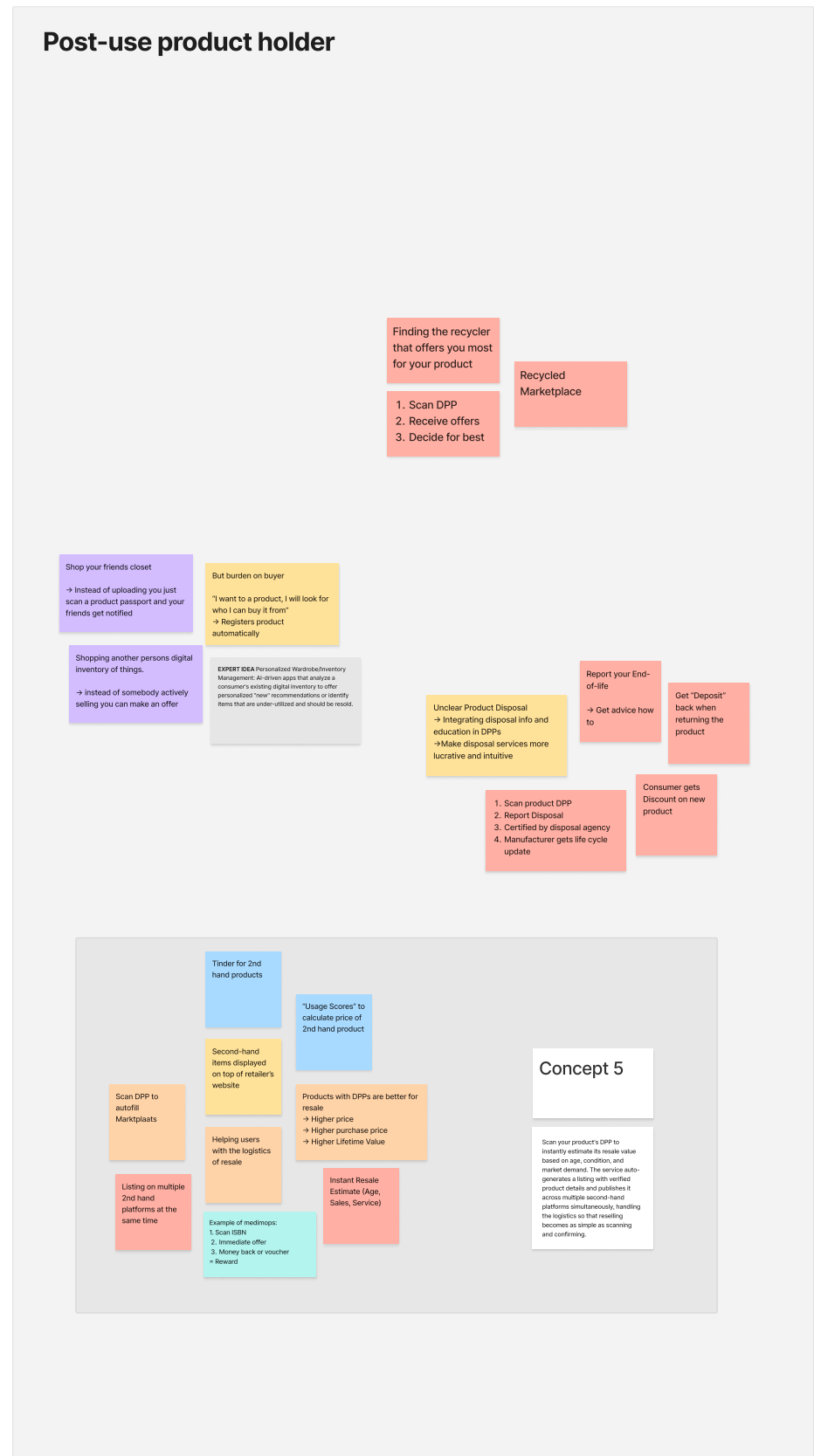
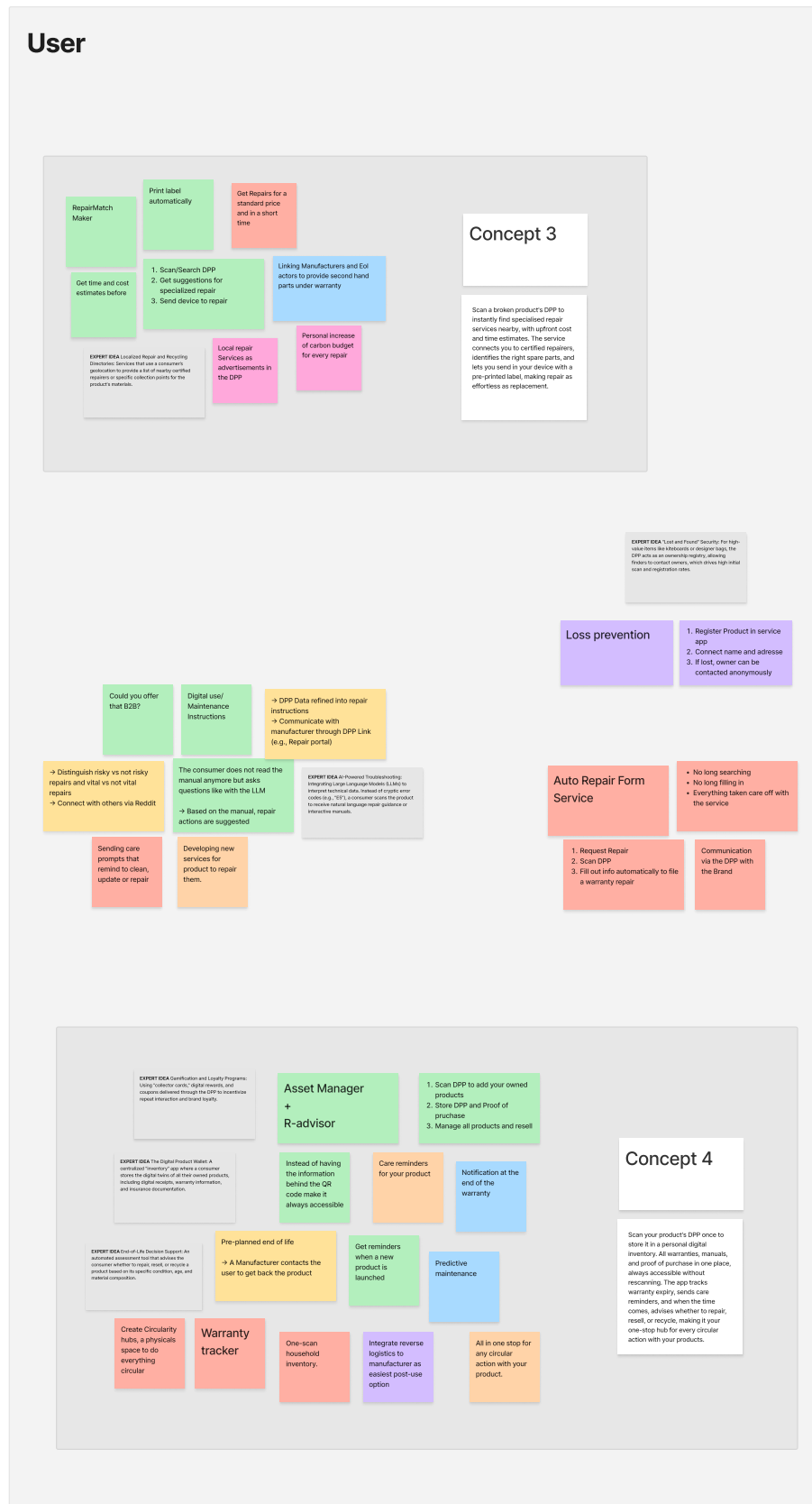
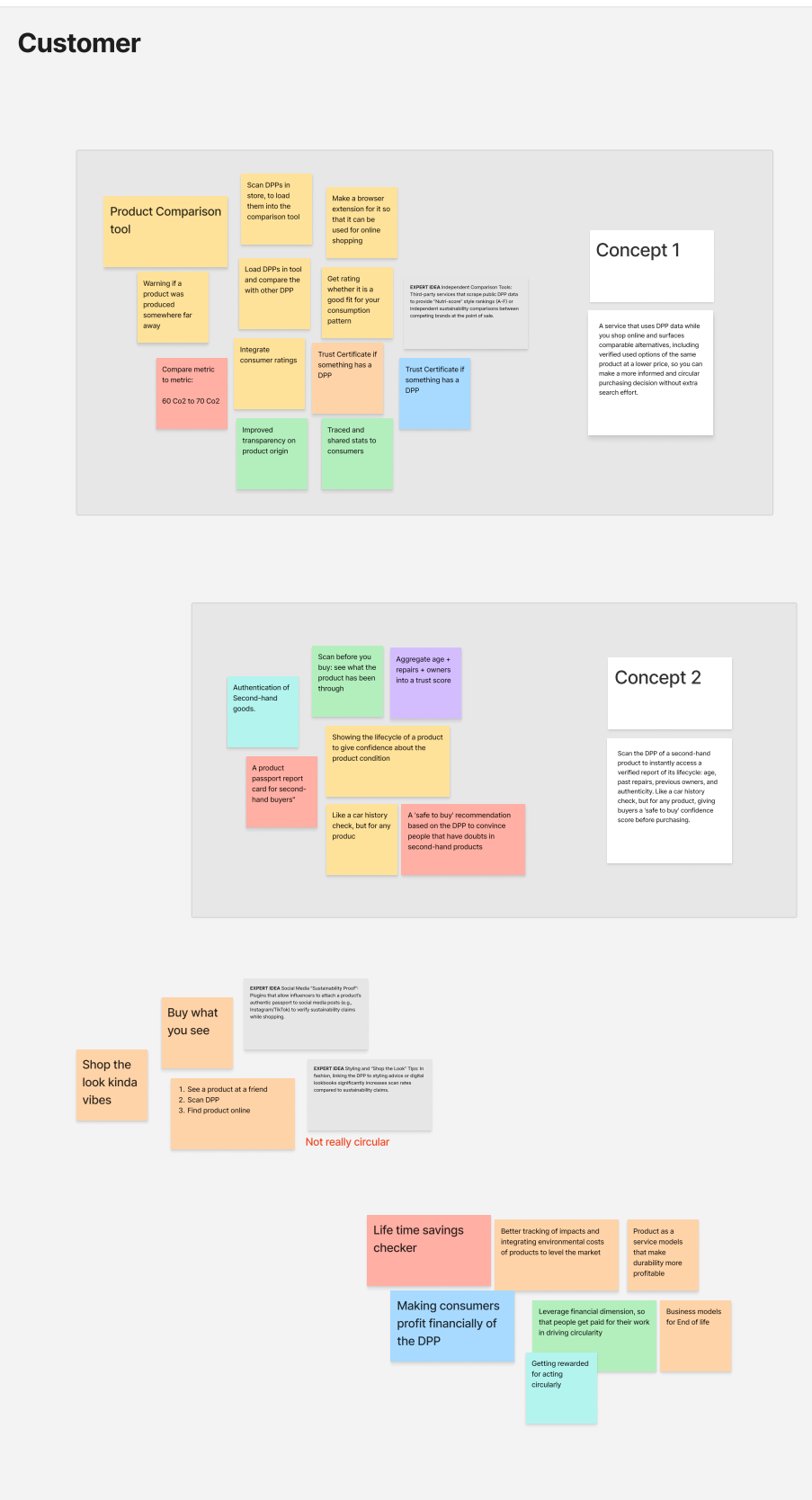
Trust Building Traceability Safety Recall

Quality Assurance Anti-Greenwashing

ESPR Article 9 (1)



Clustered ideation results with expert ideas (digitalised)



## 10.10 Interview guide - Concept test

### Semi-structured Interview Guide

Expert Interview: The Value of DPPs for Consumers – How to boost adoption.

#### 1. Introduction (3 min)

My name is Tim. I am doing research at the TU together with SECRID as industry partner. Thank you already for taking the Survey and for this call! Remember that you can at any time say that you want to stop this interview, without providing a reason. Anything you say is valid, today I want to listen to you and your thoughts. Consent form?

I will show you a set of service concepts. These service concepts are built around SECRID and its wallet but are not exclusive to them. I will ask you to react on them, share your thoughts and doubts. These are very early-stage concepts, sometimes also a bit rough, but therefore your opinion can shape in what direction we go.

#### 2. Scenario Context (3 min)

The EU is currently working on a new legislation for products. In the future every product you own - your bike, phone, and wallet - has a 'Digital Record' attached. That record holds data about the product's materials, carbon footprint, and use and repair manuals or spare part list. You can register your ownership in the record, repairs notes or the manufacturer can inform product recalls. This digital record is verified by market authorities. Today, we want to look at 5 services that use this data.

- A. Do you have any questions so far?
- B. What is your initial reaction to this concept?
  - a. Could this be useful for you? Or do you have doubts?

#### 3. Scenario 1: Pre-Loved

You are shopping for a brand-new wallet online, but it feels expensive. This service pops up and shows you the exact same model, available second-hand, for a cheaper price.

- a. Do you ever check for used versions before buying something brand new?
- b. Do you honestly switch, or do you stick with the new one because it feels fresher?
- c. Is the main value here the price difference or the time saved searching?

#### 4. Scenario 2: Certify

You are buying a second-hand wallet. You aren't sure if it's fake or damaged. You take the product code and copy it into certify to see a report on its history, previous repairs, and authenticity."

- a. Think of the last time you considered buying something used but decided not to. What stopped you?
- b. If you had this report guaranteeing the authenticity and condition, would that have been enough for you to buy that item?
- c. Would you pay 5% more for a second-hand item if it came with this digital certificate, or would you rather take the risk and pay less?

#### 5. Scenario 3: ProductWallet

You own many products that have the digital record. ProductWallet app centralizes all your receipts, warranties, and manuals in one place so you don't lose them.

- a. How do you currently keep track of warranties, receipts or manuals for things like your bike or phone? Did you ever thought about a repair but did not find the receipt?
- b. This screen notifies you when a warranty is 'almost over'. Is that useful to you? What would you do with that info?
- c. If you had a digital inventory of all your products, how else would you use it?

#### 6. Scenario 4: RepairPoint

Your wallet breaks. Instead of Googling or emailing support and filling in a long repair form you scan the product. It instantly shows local shops that can fix this specific issue, along with prices.

- a. Think about the last time something broke. Was finding a repair shop the hard part, or was it the cost/effort?
- b. This service gives you an instant price and location. Does that convenience make you repair it, or would you still probably buy a new one to get that 'new product feeling'?

#### 7. Scenario 5: SimpleSell

You want to get rid of an old item. SimpleSell estimates the value of your product and presents you the most valuable resale options. With one click and two photos your item instantly listed on Vinted or eBay for you.

- a. Do you have items in a drawer right now? Why are they there?
- b. Would you use this App if you got 10% less money than if you did it yourself?
- c. What is more valuable to you: estimating the residual value on different platforms or the one-click listing?

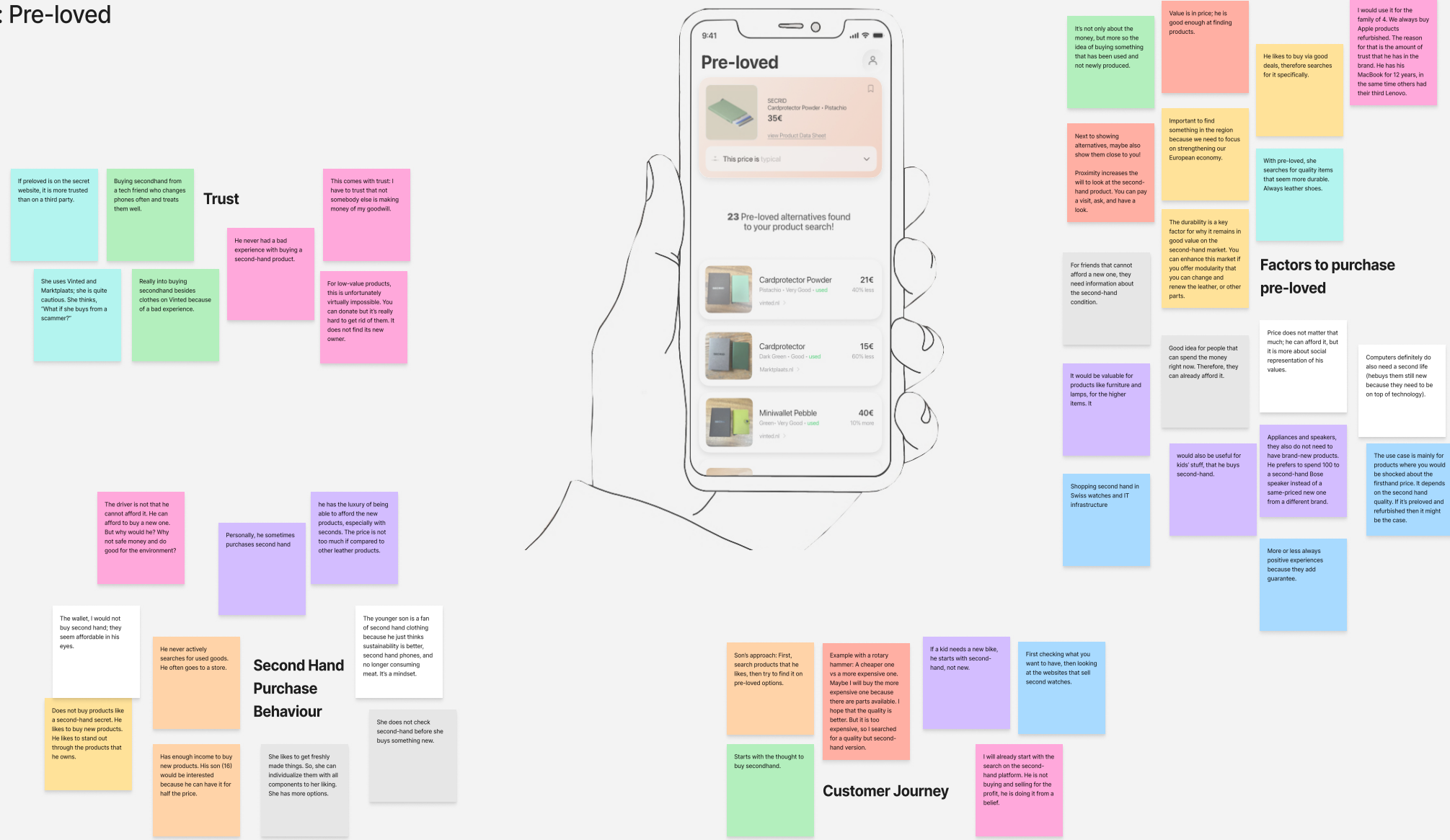
#### 8. Wrap up

- a. If you could only have one of these apps on your phone today, which one would it be and why?
- b. Which one of these seems the least useful to you? Why?
- c. If you could combine two of these services into one 'Super App', which two fit best together?

# 10.11 Concept test - Insight clustering

UCI: Pre-loved

## 1. Clustering: Pre-loved



## Summarized Insights

- Profit is a niche Use Case**  
 1. If you want a product but you realize too expensive.  
 2. Most people mentioned that the price matters but it is rather the idea of buying the same product but used that makes it appealing. That something does not need to be newly produced.
- User Journey**  
 1. Most people start with the thought of wanting to buy something second hand or new. The flow of shopping new, and then deciding for second hand does not match the usual thought process. You have to intervene earlier.  
 2. Similar apps are used a "better deal for this product"
- What matters**  
 1. When a second hand option is smart to surface, it also matters whether it is close to you and you can actually buy it.  
 2. Materials and durability is also important.
- New vs Used**  
 1. Most interviewees say that they are happy to afford a new product.  
 2. For some the usecase is: to buy a cheaper new product or a repairable, good quality used product?

UC2: Certify

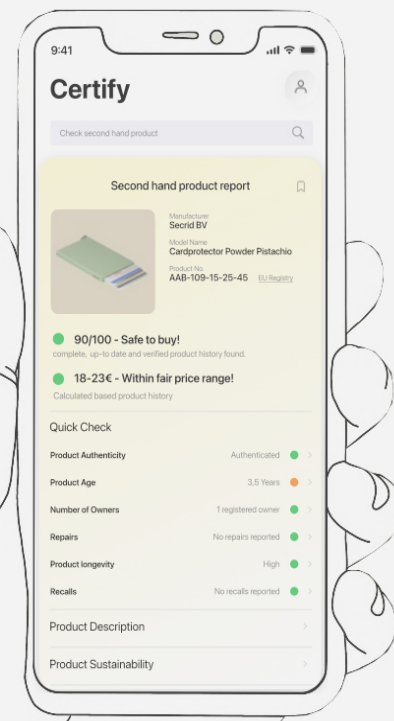
# 1. Clustering: Certify

**Factors to use Certify**

- In the watch industry it is important to see when the last service was and what changed. That gives you a good idea on how long it lasts.
- He wouldn't trust the picture in this concept. It looks like a product page photo. He wants to see the exact product that is sold.
- My son would probably not care about the clothes' history
- If a seller had a lot of reviews, then you can trust the seller better, whether they are trustworthy.
- If you can certify that it is a secret, the trust is already covered.
- In cars you can count the owners, but in products that is very hard.
- This sounds cool! You can use the history of a product to tell a story of a product. It
- The question arises: who is judging these evaluations?
- Buying it on the Leica second-hand platform. Sellers on the Leica platform are professional: they refuse private because they cannot guarantee that the condition report is accurate.
- The price range is less important. That it is safe to buy is more important!
- Specifically, information about the material is important to get an understanding of if it is durable.
- Needs explanation, because age can also mean positive.
- Explanation for why a verdict has a certain color necessary to make it feel confident.

**Trust**

- In a trusted shop there I would buy from a manufacturer, the trust towards personal people is low.
- This will really make her buy products on third-party platforms because she trusts the reported condition more.
- Certify could restore the trust in second-hand purchases.
- History gives confidence and buy for a product. It is just cost (emotional value and trust gained)
- Would help to buy watches because the segment is full of fakes.
- Helps for lacking confidence when buying second-hand.
- Never really had the doubt in second-hand purchases.
- Right now I base my trust on the reviews. But this trust is limited (e.g. for new sellers). This scales with price and money involvement.
- Therefore refurbished or backmarked is more trusted because you can choose the condition. It gives you control. Other markets have less confidence.
- Buys watches on specialized watch sellers. Trust about condition and authenticity depends on the picture.



**Analogue Services**

- It's not necessarily trust: He owns a Leica camera, and there you can see the previous owner of the product. That is handy for understanding if the asked value of the product matches the condition.
- He needs to log into the Leica platform. Type in the product number, see if it was stolen or not.
- Leica data: When it was purchased, ownership history, if repairs are logged, if it was refurbished, and the condition of the lens (minor scratches).
- Very similar to buying a car! If you buy a car, you can see the whole service history.
- It's factual rather than based on trust.
- VIN number for cars does exactly that, and I use it if someone had incidents with the car and hinders their safety.
- She would like to have this information for any product. If she wants to buy something online, then she wants to know a lot about the products before.
- Bad experience on Vinted: it's promoting you to buy. Clothes had stains and holes that were not described. Condition was reported falsely.
- Maybe not for a wallet because the value is little. But the serial number can be used to verify ownership of the product if lost.
- Or people pretending that it's a used cloth while it is a new cloth.

**Example Stories, Cases**

**Products**

- depends a bit on the product. It depends a bit on how long it lasts. For example, Swiss mechanical watches (which he collects): What materials were used, durability, what has been fixed.
- for valuables like electronics or history, it can help to buy a product more confidently.

## Summarized Insights

**History as Emotional Value**

1. The history of a product does not only increase trust but also offers the opportunity to tell a story, where the product came from.

**Purchase Risk vs Effort**

1. For low value items a history/condition check is less important than for high value items. The risk is bigger as they are more expensive. Interviewees mentioned, watches jewelry and cameras as products where this seems useful.

**Lacking trust**

1. Bad experiences of receiving a second hand product in a different condition than described by the seller. A verification of the condition would help to trust.

2. Indication has to be explained and can vary per product, (some increase when they are older)

3. Reported repairs, callbacks etc. create trust

UC3: Product Wallet

# 1. Clustering: Product Wallet

## Central Repository: Peace of Mind

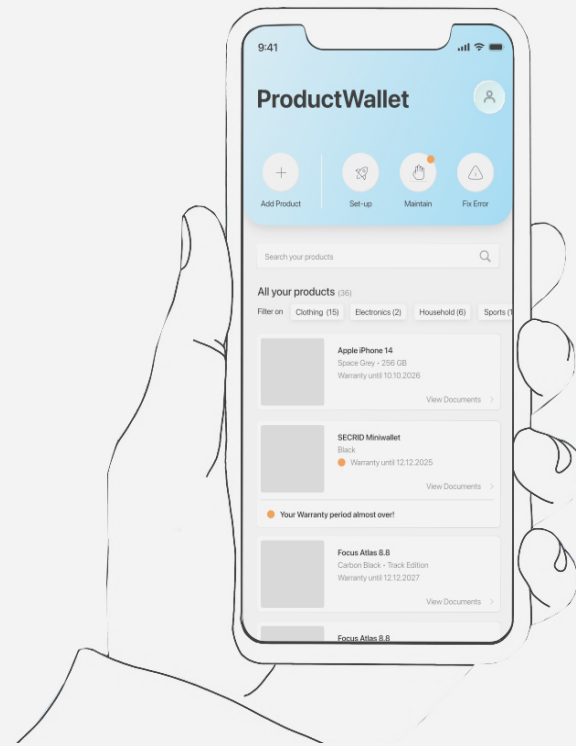
- I have lost the warranty of an electrical toothbrush. It just broke after 1.5 years, and I did not find anything back. Annoyed, I bought another one.
- He has a physical folder with receipts. At one point, they are not needed anymore.
- The receipts are not readable after some time.
- Router example that broke. It was already breaking down, but he did not know about the warranty period. He could have returned it if he remembered that he still had a warranty. Therefore, he only looked at it when it was over.
- Certification of extended warranties. He is building that himself in Dropbox where he puts the warranties. But he does not get a notification. Then he misses the warranties.
- Paper manual of a washing machine got lost during moving. Found the manual through many online researches. Was saved somewhere on the phone. Could not find it back when he needed it.
- A folder that keeps the warranties. Physical, not scanning them and storing them because it's too much hassle.
- They own a lot of Bosch households and therefore he already has this from that brand. For tools he looks at Makita. You can be sure, because it comes from the manufacturer.
- Similar exists in their family. Wife goes home, and she needs to know how to switch on the hot water in NL. We created QR codes to get to a document that explains how it works.
- Two-way communication, not having to think about the warranties.
- Always has in mind that for the most products, it is a two-year warranty and stores the copy SOMEWHERE.
- She can find it in her email but loses these emails or does not track the email.
- Wife is not technical, she can scan the QR code, opens the file, and steps are written down how to do it (came out from frustration).
- He has a physical folder of manuals at home. It's driving him crazy because there are so many. Would be helpful to have all information in a digital footprint instead of scattered.
- No use in your daily life, but it looks extremely handy to have everything in one place.
- If every company does it, there is no value, across brands more valuable.
- It is sometimes hard to find back the receipt and to repair it. You cannot create peace of mind.

## inventorising and Insurance of Stuff

- They renovated a house and needed to register their item for their insurance. It was a lot of work. A whole list of her inventory with high value clothes and jewelry can be added too to be insured. Fixed assets, like your bike and other products in your house
- If you can register it to a user, then you are the official owner.
- Really nice to have something for clothes and jewelry to understand the value of it.
- Another idea: if you split a household because people are divorcing or dead. Would help to know what is there.

## Easing Maintenance of products

- Example of old PowerBooks of a MacBook. His brother had to hint him after he read a computer journal. Then he could return it.
- Maybe go beyond notification towards a CRM system: Contact support, file a complaint, recalls are also cool!
- Electric bike: reminders that it has been a year or that you should change the filter.
- Example: Digitally tracked, if it gets stolen. App for storing pictures; you can show to the police and contact details (some they manage to find the bike, but they cannot make clear that it is theirs) and to track maintenance.
- Manuals are needed from time to time; could not find it anywhere. Hindering you to extend the utility life of your product.



## User experience.

- Highly depends on how much work you have to do yourself to add a product.
- I would be a bit lazy filling this in. It all comes with the ease of use.

## Products

Mainly for Hightech-related products that are in a household.

## Digital wallet for all important copies

- Useful for Warranties, health certificates, insurance, driver's license, all documents as long as it is protected with a password.
- Having that in an app would be helpful, maybe also with relevant manuals and documents (copy of IDs, flight tickets, more like a family wallet)
- Polution of applications that we live in; differentiation is if we converge in one place.

Who would run this service? You can learn a lot about the buying behaviour. If Amazon operates this, I would fear that they use the data to increase my purchases. As soon as you connect users to their products, that is where the money lies.

He would pay for it. That way, you trust that the service does not sell their personal data. It becomes part of the business model (e.g. Yuka).

This service cannot be run by one of the product builders, if it is across different products. But by third-party. Public organization or third-party. If this was a startup, he would use it besides if there is an investor that brings in a lot of money.

Second hand: if you understand the current resale value in the moment to resell it at the right moment.

## Easing trustworthy Second Hand Sale

If you are selling you have to find the receipt or the warranty card back. Repository would be useful if the marketplace could integrate there.

For him selling things online: the repository can be a source of information to create a listing. Also can make the listing more validated.

Third-party platform that validates technical data and condition (e.g. by integrating with the data of the manufacturer) to make purchase more secure.

To make a trustworthy ad on eBay, he goes the extra mile: makes a photo of the invoice, warranty, and added details about charging. Instead of adding that data manually, it would be helpful if a second-hand platform could draw from this automatically.

## Summarized Insights

**ProductWallet**

### Receipt, Manual, Warranty, Recalls Repository

- Multiple people mentioned that they have lost their receipt or lost track that their warranty was ending and therefore could not repair or replace a product and had to buy a new one.
- Others mentioned that losing the manual or placing it somewhere where they did not find it kept them of fixing an error themselves quickly in the moment it occurred.
- Multiple mentioned that they have either a small folder or physical folder, to know its somewhere but struggle to use it if needed.
- One app for all brands could simplify the clutter of apps on the phone.
- Feeding manuals and receipts can be useful for one whole household (shared)
- Recalls from EU keeps usage safe.
- Its giving piece of mind and overview when you need it.

**ProductWallet**

### Value your household

- Especially for valuable items interviewees mention that they would like to insure what they have. There is not a good way to keep track of what you own and what value it has. This is relevant in case of fire, flood, theft or loss when moving.
- Valuing your household can also be handy in case of divorce and death. How to split the stuff?
- Tracking the value of your stuff can also be handy to identify when it is the right moment to resell.

**ProductWallet**

### Easing Use

- Caring for the products the right way gets easier. You get reminders for maintenance checks and can log what was changed, by who and when.
- If lost you can show that this is actually your product.

**ProductWallet**

### UX & Design

- Similar apps exist. You have to differentiate through:
  - Incredibly easy adding of products (DIP-as-categories)
  - A brand that evokes trust and does not sell out
  - Maybe therefore directly charges consumers.

UC4: Repair Match

# 1. Clustering: Repair Match

### Scheduling and Finding repair

Booking a repair really increases the certainty that a product can be repaired. If you know you have a slot, somebody is there that has time for you also to go.

Collecting watches: Booking a slot to service watches. Knowing that it will be done then, knowing the time when it will be back.

I wasn't aware that you can repair the product that easily.

Could even go further and make it print out a label to return the box. Logistics is taken care of.

Useful to connect the wallet to repair places so you immediately see where to bring it.

Repairing products in Qatar is hard because there is no service there.

Scheduling a repair makes it more likely that he actually goes to a repair place (if a repair can be done in the time being there), otherwise it's more worth sending it in.

Take the router: I have no idea who repairs these kinds of products.

Would generally find a repair shop, then have confidence in booking some stuff through scheduling a booking.

Remova, wherever you go, you can find a repair point. Five or six repairs did not pay any of them and it was fixed. But you also pay for it with the price of the product.

On my account you can find a repair location that is close by.

In their app, they can see the location of the authorized dealer.

Like to book a repair slot before you go there. Then it gives certainty about that my case will be dealt with.

I can easily find the information on Google Maps. However, not the certified repairs.

booking would not matter so much. His agenda is quite flexible. He assumes it to be a quick fix.

If I knew that there was a local shop, it does not matter if it was professional.

Nice to have stuff: is to offer a scheduling. It does not matter too much finding is a bigger problem.

### Finding spare parts

Nespresso machine was leaking. Checked online for a second-hand part. Price of all parts was almost as expensive as buying a new one.

Even after the serial number, one part was not compatible with the machine.

Send back, never heard back. Coffee machine is still in the box in pieces since two years.

Getting an exact spare part is difficult.

Spare parts I would not buy from the manufacturer. But for bikes, I would not buy it from the OEM.

You just don't find the leather case without the aluminium. If you could repair the leather itself, that would be great.

Why do we not have public service manuals? You have to find the matching service manual on a shady website.

This ties well to the app before. If you have all your products in one place and you can click to find a repair for it, that would be great.

Although it is a small value item, this can really induce creating a habit.

I would use it and I would pay a small fee. Maybe I would even invest in the company.

### Accessing help for repairs from OEM

Would have been useful for their Dyson. Bad experience. They did not take care of the repair. They went directly to Dyson for support and analyzed the problem. It took ages to get a new Dyson and return the broken one.

Saving the hassle of recording and communicating the issue with a product that is the main issue he has, not finding a repair point.

For watches, there are professional repair places where you can book a slot. How much it costs and how long it takes only happens after experts have a look at it. (more trustworthy)

If you can select a cause (multiple choice) and see how long it usually takes, this would help a lot to make me more confident to go there.

## Summarized Insights

Repair Match.

### Finding Spare Part

Some interviewees mention that finding the right repair part for the product that needs repair is the biggest challenge. They have failed to self-repair a product and therefore now have a broken product standing at home. Because products are produced in different batches, and although they seem alike, the internals do not always match.

With that also skills and tools are limited and stop a repair mid way, that is caused by the manufacturers design choices.

Repair Match.

### Locating and Scheduling

Finding certified repair places in their neighbourhood hinders some interviewees to proceed with a repair. Especially for specific products or unique repairs this is difficult. Specialized repair places like bikes and electronics consumers can easily find via google.

The lack of knowing how long a repair take, how much it costs and the logistics of getting there is an equal of a problem. The uncertainty keeps interviewees from even considering to repair it, although it might take only a minute.

Booking a slot ensures them that someone has time for them. Pre-diagnostic could give confidence in what they have to expect time and price wise, increased likelihood

Repair Match.

### Pre-Diagnostics

Filing a repair at a OEM was mentioned as hassle too. Getting them to understand what the problem is takes time and effort in communicating, bad consumer service. A DPP can well connect and make it easier to communicate to the brand!

UCS: Simple Sell

# 1. Clustering: SimpleSell

## Estimating Value

You never know what the actual value is. So estimating it is very useful.

Seeing the value of watches and handbags, luxury items.

Value estimation would help to take one barrier out of reselling.

I use eBay to check the value. Then I can check whether it is worth it. But this tells you nothing about how likely it is to sell. Either I then underprice or really make a lot of photos and good descriptions.

For watches, you have to get a valuation from experts, which is a lot of work.

Large insecurity about the value: what is fair to charge for a second-hand phone?

## All end of life-options

In a way, it would solve it. If I would not know what to do with it.

But I would always donate it. Not monetary value but doing good.

Maybe this app could also inform you what to do? Sell, recycle, or donate.

## Product value

Our laptops or phones, I give to somebody who is refurbishing it and donating it.

I am not starting for low-value items. Besides, I can donate it, that would be cool to find where and how to donate it.

They have the "graveyard" in the family. It's full of USB chargers, for example. It's too much hassle to sell that, and they have too little value. People have to write and list it.

For little price items, either give back or donate.

## Providing others trust in buying

Rebuy will give you less than you could get on eBay.

Rebuy bad experience: they list a failure which is non-existent. Therefore, you get less money for your phone than is promised to you at first. You have to trust them that they do not come up with something.

How can you show the condition of an object if you cannot see, feel, or try it?

This could also give you some credibility: you can add the link of the product data to justify a price through condition.

Price estimation is sometimes difficult to achieve if it is rarely traded. Normally, looking at a few eBay listings to identify a value.

No AI descriptions and pictures. They seem not trustworthy at all.

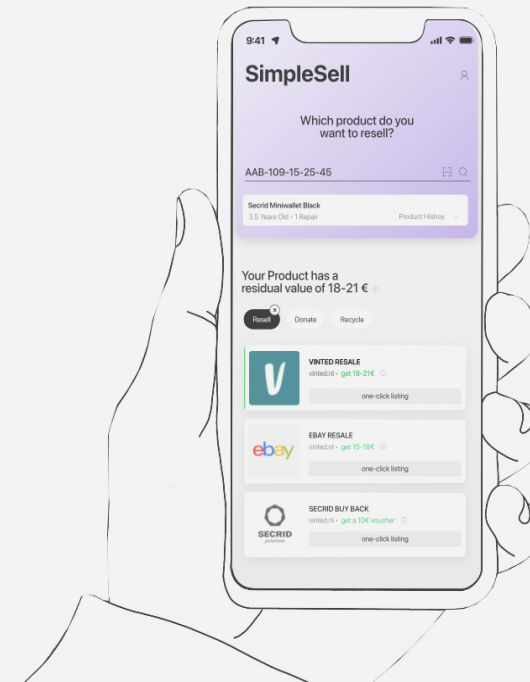
## Place to have it sold

Not where is the best price but where it is best sold: What is the most convenient place to sell it?

Listing it to two platforms to have more reach and a higher chance to sell it.

One-click listing is similar to eBay: I have the same things to sell and take some data.

Would also be handy to know which platform it sells best: 25% chance to sell it on Vinted, 50% chance on eBay; potential money is not as good as real money.



## Time saved

I do not sell second-hand because I do not have time. Even though I could because I have a lot of products lying around (describing, listing, photos).

One-click listing is one thing, but the communication is also a lot of effort.

It feels like a side job selling something. It depends on how much time and energy you have after work.

I buy and sell a lot of board games. Very much effort. The information is usually not good, so I have to put in the data manually.

There are already big marketplaces, which are followed. This would be another channel. Not a direct benefit.

It has to add something different that the others don't have.

## Summarized Insights

**Trust Badge**

The lacking trust in second hand products is also a problem for sellers: How do you differentiate yourself in the sea of fakes? How can you give trust to the buyer? How can you justify a higher price because your product is actually in a better condition?

- This problem led to the idea that you can provide a "background check" or "verified condition" report to product you are selling to bump up trust.
- This "recorded, verified condition" also appears to solve the problem that some refurbishers promise more money that they pay out later. Saying that they have found a failure or defect (which might not be there).
- Right now consumers extensively describe, photograph and provide receipts to increase the trust on the buyer side.
- AI descriptions and photos decrease trust.

In a way this plays into the theme of increasing the chance to resell rather than the profit.

**Probability over Profit**

The chance and speed in which a product is resold is equally important. Consumers start listing products on multiple platforms to increase the chance or invest time and effort in product descriptions and photos to differentiate from the rest.

Interviewees mention it would also be interesting to see the likelihood on that a certain product type is sold on a specific platform.

The desire to quickly get rid of things rather than maximizing profit also reflects in the wish for donation as an option. Multiple interviewees struggle to find places to donate their products or to get rid of them the correct manner.

This effective altruism can also be caused by the fact that the interviewees are potentially part of better earning citizens.

**Valuation as Barrier**

Some consumers mention that they struggle to price second hand products correctly. Especially for high-value and rarely traded items this is a problem others simply scan similar products on second-hand platforms to get an idea what they can sell it for.

**Time Saved**

Most interviewees mention the amount of effort and time that it takes to resell items. Some mention it feels like an extra job. Preparation, communication and sending would occupy too much time and headspace.

However most people have products at home they wanna get rid off, but find it too much effort.

Roundoff

## Roundoff

### Products

Most useful for high-value items.

Helpful for any products to have additional service and information (e.g. for electronics if it is easily disassembled).

Services for products: products that are bought as some sort of an investment.

Products for these services are probably electronics: they are more complex. They are harder to repair. Therefore, the feeling of not being able to do that is higher.

### Most favorite:

Certify and wallet are the most useful because they can really minimize stress.

It is so difficult to document the high-value items in your house for insurance and yourself.

Pre-loved is cool because they are used in the car industry.

Repair-point might be either most desired. You want to do it, but you just cannot because it is so much of a pain.

The wallet is very useful. Especially that you do not have only a single brand but you can also use it across brands (there is no common layer).

The wallet app is best but not really because of that; it is not out there but because of the trust in the brand.

Best would be the inventory one: He had this problem before, so he can relate to it best.

The preloved one is offering the least nice one: He can do it himself.

Product wallet because I would like to keep everything in one place.

Certify I would love because I am interested in the details about a product.

Most use on the Repair concept. He has found his own way to sell and buy on secondhand. But he cannot repair. The builders make it hard, and it takes a lot of effort. This is his biggest problem.

Product wallet can be a central hub for the product and other services.

He would first focus on a second hand wallet market.

If you simply sell and connect it to stores where you can buy new.

Simple sell with a duration option.

Repair use without a second thought. I would even use it if it cannot take back directly, and they send it back in time.

The wallet does not really create a need; he has his apps in place.

### Other ideas:

You can use who made the wallet and who owned a wallet to tell a more emotional story.

Implementation Technical Info:

Second-hand platforms have bad APIs. It's hard to integrate with them.

Listing on multiple platforms is hard because they don't have common layers. APIs are not sufficient.

The wallet is easiest to build yourself. You can consolidate the (online, offline) data easier. It needs to be secure.

Repairability and second-hand concept are complex implementations and go-to-market perspectives: You need the shops, the network, and where to launch it (e.g. uber eats, Uber Eats, but not available for me). The marketplace has a lot of brands failing, maybe not the right timing yet.

misses the information about where materials are coming from. He wants to support the European Union. Information on where it is coming from and how it was made (the story behind it).

Technical Implementation:

I think the challenge is not a technical one. It lies in the business model: how can you finance this beyond the pilot?

Repair product is difficult because the infrastructure is not there; or start in a segment that has a lot of repair places: e.g. bikes.

Go to bol.com. 80 Euros or refurbished for 50. Scan the QR code and buy within a 3km radius. Add a margin for the store.

## Summarized Insights

### PRODUCT CATEGORIES

Interviewees find presented services predominantly useful for products that are:

1. higher in value (Electronics, Furniture, Paintings, Watches, Bikes, Jewelry). As the perceived value offsets the higher effort in maintaining/caring about them. Also the risk of loss is bigger. And the chance to earn a decent amount when reselling.
- Appear more complex. Which makes consumers more dependent on outside (repair) services.

### SERVICE RANKING

1. 7 out of 10 participants mention that the Product wallet is their favorite concept because they can relate to the problem most. They would use the app if:
  - It had super easy product adding features
  - works across all brands.
  - tracks value of owned stuff
  - Insures household appliances for moving, burning or theft.
  - For the others it does not resonate as they have branded solutions that do similar (bosch, apple)
3. Repair match resonates with consumers that have experienced the struggle of repairing something themselves and failing. Finding exact spare parts is a problem and repair places that can do more complex repairs.
4. Certify resonates mostly with consumers that are into collecting rare items like cameras or swiss watches. For them a whole background check of the product is very interesting as it minimizes the risk with a big investment. This concept also enjoys awareness as it is similarly used in the second hand car selling. Getting the history of watches also can be used to tell a story about a product one interview participant mentioned.
5. Simple Sell resonates beyond profit. Finding places to donate is similarly a problem. Finding the platform where it is most likely to sell is as important (real money is better than potential money)
6. Pre-loved is ranking last. Interestingly, it's not necessarily about a better price but more about the idea to not buy something new. This may be because of a target group mismatch (most of them say they have enough money to buy new)

### Feasibility & Viability

1. All concepts are technically possible to implement. However some are easier than the other.
- a. APIs from second-hand platforms are quite bad. If you have a service like SimpleSell or Pre-loved that reads/writes data this is a problem. First-hand data is better, cleaner. You can scrape but that can induce mistakes easily.
- b. RepairMatch Works in market where there is sufficient coverage of Repair Infrastructure. Otherwise searching via search engines is still easier. Solution could be to launch on a market with more repair places (electronics or bikes). It takes a lot of effort to contact repairers to join the platform. You can only launch it regionally before you can scale it.
- c. Wallet seems to be easiest to start with building.
- d. The Wallet has to make a super responsible, trustworthy appearance. Fear of fading data can inhibit adoption, like a Bank that keeps your secrets.
- e. The main challenge is how to build a business model.

# 10.12 Experiment 1: Market research

EXPERIMENT 1

## Experiment 1

**Riskiest Assumption**  
Consumers perceive missed warranty periods and lost product information as urgent enough pain to adopt and pay for a dedicated solution.

### Competitors

**Inventory: Private consumer**

- 4.7 stars, 800+ ratings, 10k items added, the "best-in-class" and not just any.
- Recently added QR codes, better + stores for professional engineers, pushing toward B2B use cases by experts.
- Insurance is the primary marketing angle / not product use or capacity.
- Users spend more time in the app than on the website.
- Most feature set of all 20 apps, with every maintenance schedule, insurance claims management.
- Price at \$10-\$15/mo subscription.

**Inventory: SMEs**

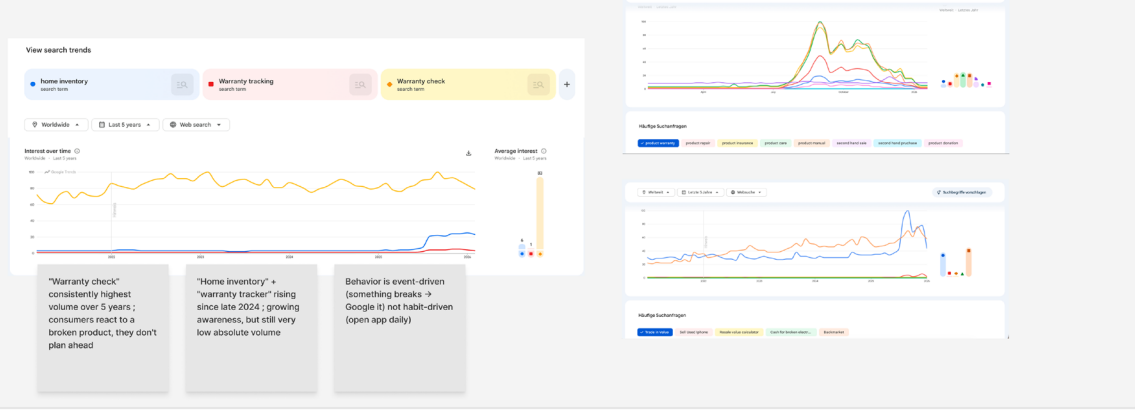
- Just launched AI "Tech Intelligence" (Dec 2023), rating 4.6 about your home value, maintenance, troubleshooting.
- Also offers Home + Business Pro version, says they couldn't sustain on B2C alone.
- Premium costs at 3,000 items for \$10/mo.
- Intelligent Inventory.
- One of the oldest in the space, iOS only, one-time \$4.99 purchase.
- AI SERVE.
- Priority insurance - because maintenance for discounting possessions are always.
- Also has a separate business version, B2C alone wasn't enough revenue.
- Started as B2C home inventory, a limited entry to small business and insurance.
- Now price at \$10-\$15/mo for business users, completely abandoned the consumer price point.

### Warranty Apps

**Warranty Apps**

- Simple, intuitive, easy to use.
- Latest content from a major brand, strong app post (Sep 2023), founder said \$100k on a revised warranty.
- AI-powered receipt scanning with auto-warranty extension, most modern tech approach.
- Simple, intuitive, easy to use.
- Subscription based pricing.
- 4.4 stars, only 10 reviews after 4+ years LOW growth.
- Minimal feature set, basic warranty tracking and reminders.
- Confirms the smallest viable version of this concept still can't attract users.
- Primary risk, all used emergency, good ideas, but lack network effects and clear features.
- \$2.99 one-time purchase, extremely low price point, high developer churn, almost no user engagement.

### Trend Analysis



# 10.13 Experiment 2: Market research

EXPERIMENT 2

## Experiment 2

**Riskiest Assumption**  
The unknown value of a product or a household is a problem that consumers seek to solve.

### Competitors

**Competitors**

- Luxury Second Hand selling -> needs Authentication**
- Authentication service**
- AI powered = Trust???**
- AI-Powered Authentication for Absolute Trust**
- SCALABLE AI-POWERED SOLUTIONS FOR PRODUCT AUTHENTICATION - ANYTIME, ANYWHERE.**
- WHEN TRUST & AUTHENTICITY ARE CRITICAL TO YOUR SUCCESS, WE'VE GOT YOU COVERED.**

### Investing into collectibles

**Investing into collectibles**

- StockX**
- Best moment to buy/sell**
- Have vs want**
- Make a collection of rare vinyls and value it**
- Understand the Value**
- Share Your Collection**

## 10.14 Experiment 3: Repair field research

**Experiment 3** | Riskiest Assumption: Both consumers and repair shops experience a pain that a digital platform can solve.

Visited repair shops

Only physical price lists. Repairs are usually not more expensive than 40 Euro...

Website what is offered, but no prices.

Online solutions for Clothing repair

**The Mender**: Founded 2020, UK-based; connects consumers with 2,000+ local "Makers" (tailors, cobblers, menders). 20% service fee on all bookings; platform takes a cut on every repair transaction. Key pivot: moved from pure B2C to B2B2C; brands offer repair as a post-purchase service, subsidize or incentivize through loyalty programs. Brand partnerships are the real growth lever: partnered with Adidas (loyalty points for repairs), Net-a-Porter, Joanie, Flax & Loom.

**tingit**: Zero-effort repairs for your shoes, bags & clothes. Founded 2023, launched Feb 2024 in Lithuania only; very early stage startup. 650+ completed repairs, 2,500+ repair requests; traction signals but still tiny. 70% of orders are shoe repairs; high-value items drive demand, not everyday textile fixes. How it works: 01. Subbed a quick video; 02. Got your quote & pay; 03. Drop off your items; 04. Founder's own story: took 6 weeks to organize a single Dyson repair; validates the hassle is real, but the solution requires heavy logistics orchestration.

**REPAIR**: Founded 2022 in Netherlands by Agnes Weber & Daan Maasson; won Newscaster of the Year 2025. Pivoted from D2C to brand-only; "Our direct-to-consumer repair portal is no longer available"; B2C alone wasn't sustainable. Now powers repair for Tom Tailor, MUD Jeans, Kings of Indigo, Arnedingale, Fabienne Chapot, G-Star. Recently added resale service for MUD Jeans; expanding from repair into full lifecycle platform.

## Field Research Report: Garment Repair Observations and Business Operations

### 1. Recording Entry 1: Customer Profile (Audio-2026-01-28-11-21-04)

- **Participant Profile:** The subject is a male consumer of high-end apparel, specifically citing the ownership of trousers valued at €400. Despite a family history of sewing - noting that both his mother and girlfriend possess the requisite skills - he represents a clear "Decline of Intergenerational Skill Transfer."
- **Key Findings (Repair Habits):** The primary driver for repair is a visceral annoyance when high-value investments fail. Notably, the customer journey begins with a pre-visit phone call to verify service feasibility and price points. His preference for professional services over family labor is categorized as a "labor-saving preference," where the convenience of a commercial transaction outweighs the social effort and obligation involved in requesting a favor from relatives.
- **Pricing and Timing:** The participant's value assessment reveals a nuanced threshold for repair costs. While he seeks a rapid turnaround, his perception of price is tied to the perceived complexity of the task rather than the value of the garment.
- **Social Observations:** There is a transition from communal, skill-based domestic labor to a commodified service model. The subject views the professional shop as a tool for efficiency, bypassing the "effort" of leveraging traditional family knowledge.

### 2. Recording Entry 2: Professional Services and Market Trends (Audio-2026-01-28-11-23-22)

- **Participant Profile:** This entry covers professional operators and their diverse clientele, which includes a significant demographic of price-sensitive younger consumers, such as students.
- **Business Operations:** The operational infrastructure is strictly manual. One operator utilizes a physical pegboard system to maintain a visual overview of the workflow. The fragility of these lean, two-person operations was observed when one worker's illness disrupted standard procedures. Furthermore, while "price lists" exist in theory, they are not always accessible or utilized during the intake process, illustrating a reliance on the operator's immediate presence.
- **Market Dynamics:** Demand is subject to seasonal fluctuations, with a higher volume of repairs recorded during the winter months. The fundamental market driver is economic; the escalating cost of new goods makes repair the more viable financial strategy for the "student" demographic.
- **Pricing and Timing:** Offers were consistent at €10 to €15, with an impressively high-velocity turnaround time of **within one day**.

### 3. Recording Entry 3: Generalist Service Model (Audio-2026-01-28-11-31-10)

- **Participant Profile:** A professional practitioner working within a two-person team.
- **Business Operations:** The shop adheres to a "Generalist Service Model," maintaining a "repair anything" policy rather than specializing. The operational environment is characterized by "Analog Persistence," relying on physical artifacts for organization.
- **Pricing and Quotation Logic:** While a standardized list is maintained for routine tasks, the practitioner emphasizes a preference for personal inspection for complex jobs. This allows for a bespoke quotation system, as costs for non-standard repairs cannot be accurately predicted without physical assessment.
- **Timing:** The service operates on a longer lead time than the high-velocity shops, with a cited maximum turnaround of **four to five days**.

### 4. Recording Entry 4: Specialized Solo Operation (Audio-2026-01-28-11-47-41)

- **Participant Profile:** A solo practitioner whose business model is defined by a commitment to technical quality and independent operation.
- **Business Operations:** This shop represents the extreme of the analog spectrum: there is no digitalization and a conspicuous absence of a formal price list. Communication with the operator is described as difficult, suggesting a focus on craft over customer service.
- **Key Findings (Philosophy):** The practitioner operates on a "Value-Based Pricing" model. He justifies higher-than-average costs by citing the use of "quality parts," positioning his service as a premium alternative to standard repairs.
- **Pricing and Timing:** Upfront cost estimation is refused without a physical inspection of the garment's condition. Despite the lack of formal intake structures, the actual labor is completed quickly, requiring "little time" once the work commences.

#### 5. Recording Entry 5: Individual Maker and Social Connector (Audio-2026-01-28-12-11-44)

- **Participant Profile:** An older woman who is a skilled maker of new garments.
- **Key Findings (Habits):** A significant ethnographic detail emerged: despite being a master of the craft who prefers the creative expression of making new clothes, she **outsources her own repairs** to professional shops. She views repair as a functional necessity for garment longevity but chooses to pay for the service rather than perform the labor herself.
- **Social and Organizational Observations:** The participant identified a "Trade-off Opportunity." She reacted positively to a system that would connect home-bound older sewers with younger people (students) in need of repairs, potentially bridging the intergenerational skill gap.
- **Community Context:** She highlighted the isolation of the craft, noting that she is one of the last active practitioners in her social circle; while she knows others who create new items, the culture of repair has largely vanished from her peer group.

#### 6. Consolidated Synthesis of Findings

Across the professional landscape, the research identified a consistent rejection of digital systems. Key traits include:

- **Manual Infrastructure:** Reliance on physical pegboards and handwritten lists.
- **Staffing Fragility:** Small-scale teams (1-2 people) where illness or absence significantly impacts service capacity.
- **Inspection-Driven Pricing:** A widespread reluctance to provide fixed digital quotes, favoring physical assessment to manage the risk of complex repairs.

#### Consumer Motivations

The research identifies a framework for current repair demand:

1. **Price Anchor Effect:** The high cost of new luxury goods (e.g., €400 pants) creates a psychological "anchor" that makes a €10 repair feel like a rational economic preservation of value.
2. **Labor-Saving Convenience:** Even customers with access to skilled "free" labor (family or personal skill) choose professional shops to avoid the social effort or time-cost of DIY repair.
3. **Sustainability vs. Creativity:** For older makers, repair is a functional necessity to be outsourced, while making is a creative hobby to be protected. This suggests a potential "trade-off" market for connecting latent home-based skills with the high demand from younger, price-conscious demographics.

## 10.15 Experiment 4: Interview guide - Insurance expert

### Experiment Allianz Insurance (10mins)

#### Hypothesis 1: Incomplete claims as a pain point (4 min)

1. What information do customers typically need to provide when reporting damage or theft?
2. How often are damage reports incomplete or delayed because customers cannot provide a purchase receipt, product details, or value?
3. What does that cost you; in terms of processing time, back-and-forth communication, or fraud risk?
4. If you had immediate, verified access to a customer's product details (model, purchase date, value, condition history), how would that change your process?

#### Hypothesis 2: Better data = better pricing (4 min)

1. How do you assess a person's possessions today when they take out a household or personal property insurance policy?
2. Are customers generally underinsured or overinsured because they do not really know what they own?
3. If a customer could provide a verified, always up-to-date inventory of their belongings, would that enable you to offer tailored or more competitive premiums?
4. Is there interest in such product data in the industry, or are there concerns (data protection, complexity)?

#### Closing (1 min)

1. In your view, where is the greatest inefficiency in the current process that could be resolved through better product data?

## 10.16 Experiment 4: Insurance expert insights

### Interview Insights

- Household insurance: Everything that can be taken along when moving.
- Either the customer can estimate the value of their household contents. In 80% of cases, a flat-rate solution is used depending on the living space and neighborhood (regional class). If normal furnishings are present, coverage is set at 850 euros per square meter.
- Exact product knowledge is especially useful for high-value items. Above all, it is not the insurance company's job to initiate this, but the customer's responsibility.
- To conclude an insurance policy, there is actually no interest in exactly what is in the apartment unless it is of high value.
- Only in the event of a claim is the insured party obliged to provide proof.
- Receipts, manuals, and certificates all serve as proof of an item. Valuables must otherwise be insured at a higher rate.
- Incomplete damage claims can rarely provide no proof. In cases of water or fire damage, the items are still there; only in theft cases are they gone.
- In the event of a claim, receipts for everyday items are often missing, or they were paid for in cash. That makes things difficult; each case is looked at individually. If the insured party has a total sum insured of 150,000, we simply assume that they had a TV worth 2,000.
- **The accusation that insurance companies try to cut payouts in the event of a claim is always present. But you always have to ensure credibility. If the customer wants 4,000 in the event of a claim but only has a receipt for 199 euros, it is hard to believe.**
- **It is rather an opportunity for the customer to be better prepared in the event of a claim than something that brings a significant advantage to insurers.**
- For normal household contents (80 sqm), the premium is rarely more **than 20 euros**. We are talking about marginal premium changes if insurance becomes even more individualized;

## 10.17 Experiment 5: Market research

**Experiment 5** Riskiest Assumption  
A data-sharing value exchange between consumers and brands can sustain a viable B2B revenue model.

**Experiment 5** Riskiest Assumption  
A data-sharing value exchange between consumers and brands can sustain a viable B2B revenue model.

Founded 2021, 1M+ users, 5,000+ restaurant partners across 53 cities in 4 countries; rapid growth

Consumer pays subscription: €4.99-6.99/month

Restaurants list for free; NeoTaste monetizes from consumer subscriptions, not merchant fees

Value is discovery + savings: "How many restaurants have you actually tried in your city?"

The verification itself IS the value exchange: students authenticate identity -> brands get verified audience -> students get exclusive deals

Completely free for students; brands pay for access, campaigns, and verification services (B2B revenue model)

Students willingly share personal data (university email, enrollment proof) because the reward (discounts) is immediate and tangible

Free to use, no registration required; lowest possible barrier to entry

Consumers track cycling kilometers -> redeem for rewards at local partners (coffee, pastries, museum entries)

In return, users donate anonymized route data -> cities use it to plan cycling infrastructure

**Loyalty Platforms**

8.5M+ active cards covering ~70% of Dutch households; near-universal adoption

Cardholders spend 25-30% more annually than non-members; loyalty directly drives revenue

Min Bonus Row: AI-driven personalized offers based on purchase history, updated weekly

Consumers share all purchase data -> AI uses it for pricing, inventory, supplier negotiation, and targeted marketing

Free to use, zero friction: scan at checkout, get lower prices instantly; the data exchange is invisible and effortless

## 10.18 Interview guide - Usability testing

### User Test Protocol – Wireframes

Duration: 25-30 min | Format: Moderated, think-aloud | Participants: 5–7

#### Introduction Script (3 min)

Thank you for joining. I'm a design researcher at TU Delft. I'll ask you to interact with an early app prototype - and I want to be clear: we're testing the design, not you. There are no wrong answers. If something is confusing, that's the most useful thing you can tell me.

As you go through it, please think out loud - tell me what you see, what you expect, and what surprises you. I may not answer your questions during tasks because I want to see how you'd navigate on your own. I'll answer everything at the end.

May I record this session for internal research only?

#### Warm-Up (2 min)

1. How many products do you own that came with a warranty or manual?
2. When something you own breaks, what's the first thing you typically do?

#### Task 1 - Onboarding (3 min)

Go through the start of the app as if you were setting it up for the first time. Tell me what you understand about what this app is for.

1. In your own words, what does this app do?
2. Was anything during setup unclear?
3. What do you expect to be able to do once you're in?

#### Task 2 - Home Tab Comprehension (3 min)

Take a moment to look at this screen - don't tap anything yet. Tell me what you see and what you think each section is for.

1. What would you expect if you tapped 'My Benefits'?
2. What kind of alert would you expect here?"
3. Is anything on this screen unexpected for an app like this?"

#### Task 3 - Add a Product (4 min)

You just bought new Anneloes Dress and want to add them to the app. Show me how you'd do that.

1. How long would you expect this to take in real life?
2. Was there a step where you'd likely give up or skip?
3. What would make adding a product feel worth the effort?
4. What would you like to see after adding the product?

#### Task 4 - Finding a Product Action (8 min)

##### Task 4A - Repair

Your Secrid wallet does not hold the cards anymore. You want to get it repaired. Show me how you'd do that with the app.

1. Stay on the product page and tell me what you see!
2. What did you expect to happen after tapping that?
3. What's missing that would make you more confident to proceed?

##### Task 4B - Resell

You've decided to get rid of your Atomic Boot. Show me how you'd use the app to do that.

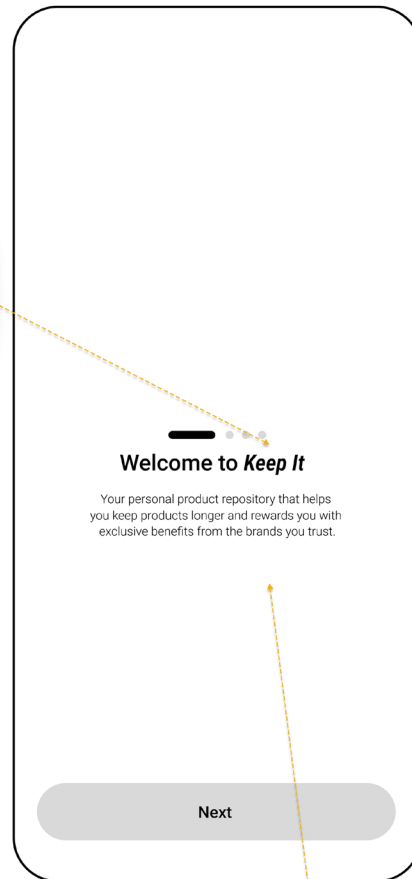
1. What did the app actually do for you there?
2. What would you still need to do yourself to complete the sale?
3. Would you trust this process? Why or why not?

#### Task 5 - My Brands Tab (4 min)

You notice a tab called 'My Brands'. What do you expect to find - then take a look and tell me if it matches.

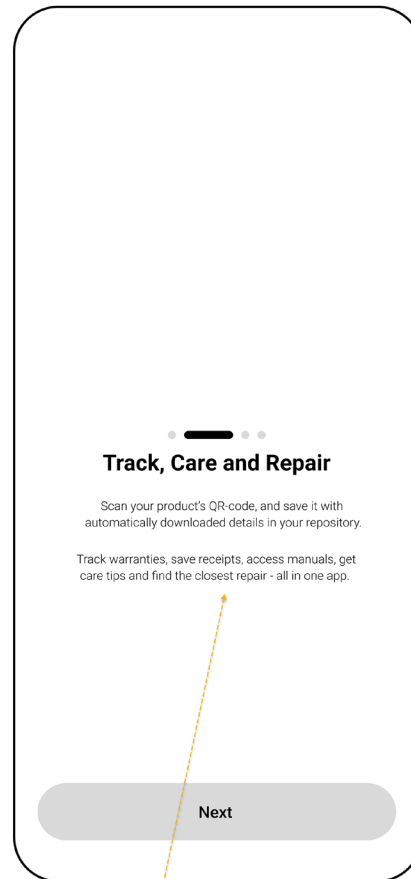
1. What's the difference between this tab and My Products, in your mind?
2. Would you visit this section regularly? What would make it more useful?
3. Does 'Upcoming Events' feel relevant to you as a product owner?

# 10.19 Usability test findings

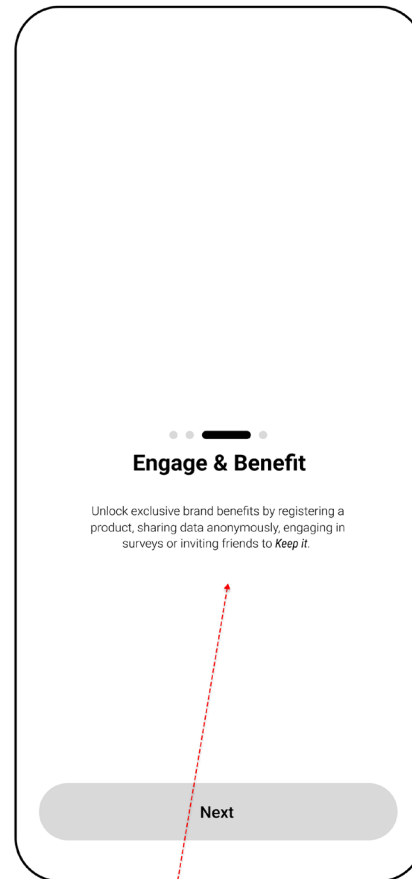


**SLIGHT UNCLARITY**  
 Name suggest that you are becoming a better person. Not really that you can access a brand space and get benefits ect.

**SLIGHT UNCLARITY**  
 What do I have to scan? Helps to store DPPs maybe add DPPs

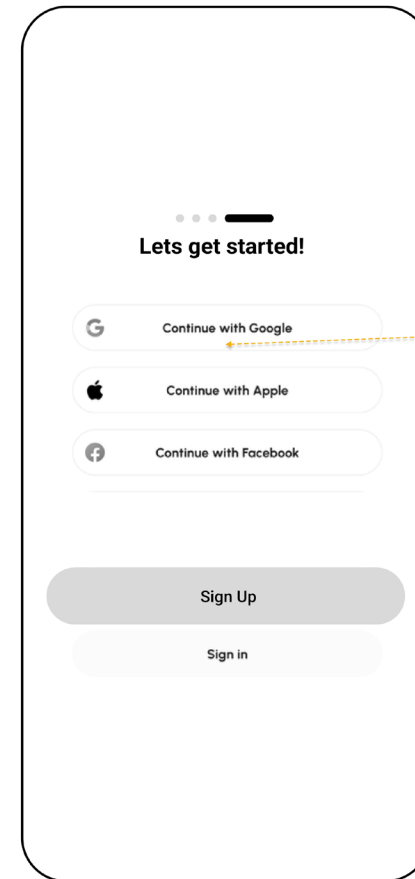


**SLIGHT UNCLARITY**  
 I wonder if I have to do all of these.



**Unrelevant?**  
 Usually the aspect of getting benefits for joining on the app is not mentioned as integral part of the first summary what the app can do.  
 Sounds like something most companies would do.  
 I haven't seen the need of it. But I tend to shop brands.  
 This seems a bit "silly" or "tacky". It shapes a bit mistrust.

**User Idea**  
 Brand benefits are nicer if they feel exclusive/ tailored to you. that they know what you like at one point.



**Expectations of app interface**  
 Expectations of the app:  
 1. Scan/Add product  
 2. My products  
 3. My Profile  
 4. Map where I can see the Repairs/ or where to dispose of products  
 5. Rewards and Benefits  
 6. Some sort of location identification to find things nearby  
 7. Stats or receipts

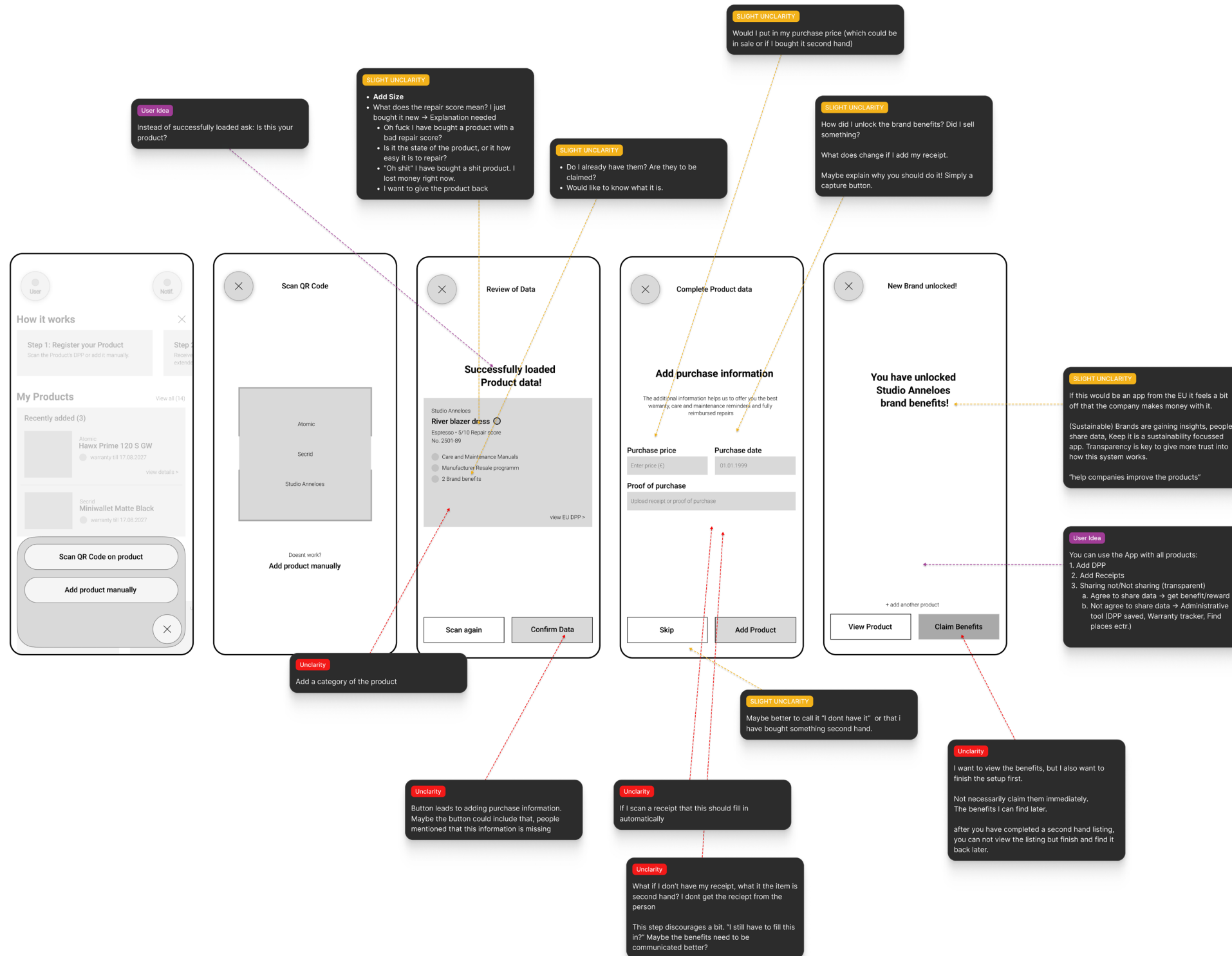
**Expectations of app interface**  
 My product and everything it surrounds to make me keep it longer.

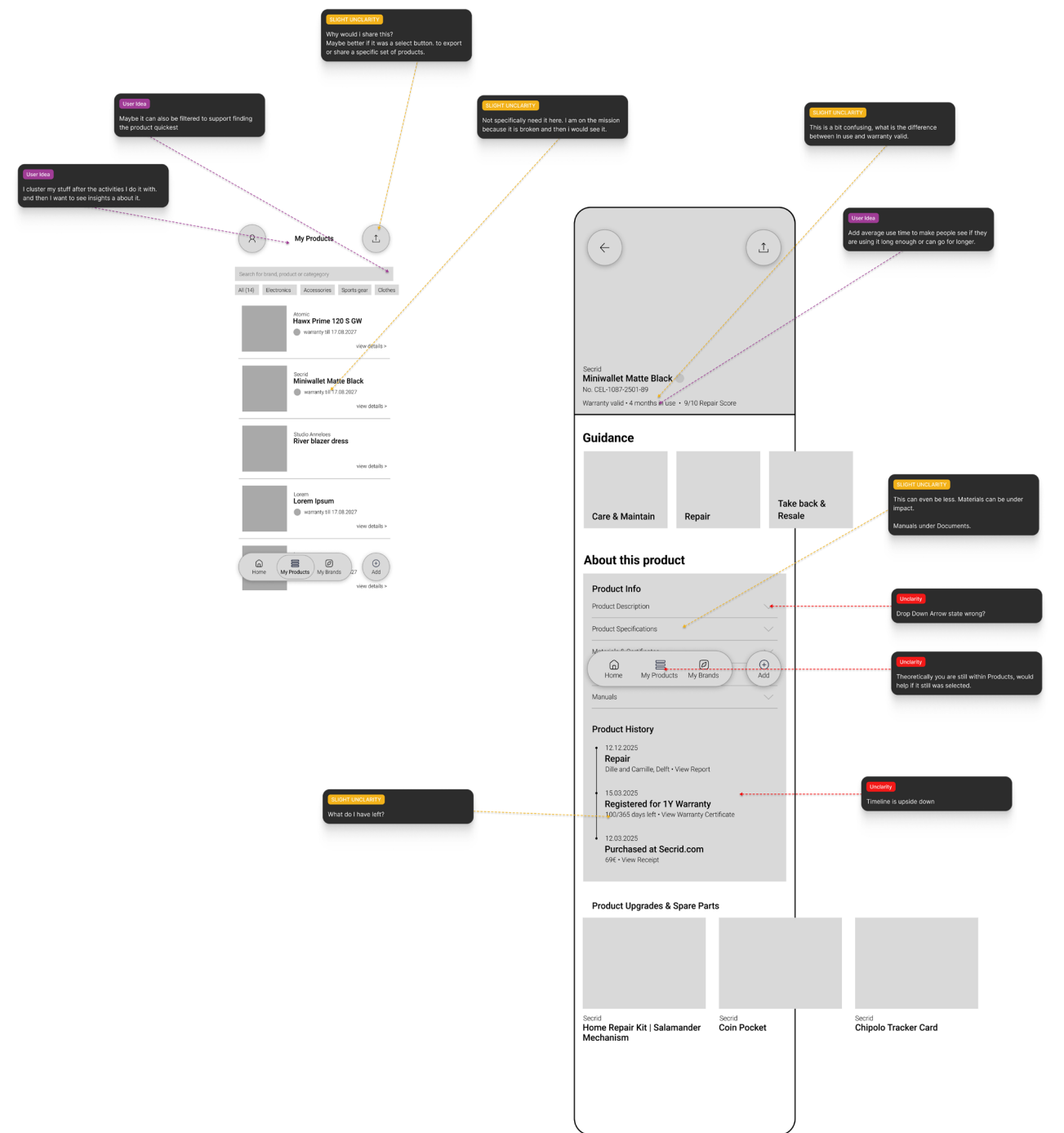
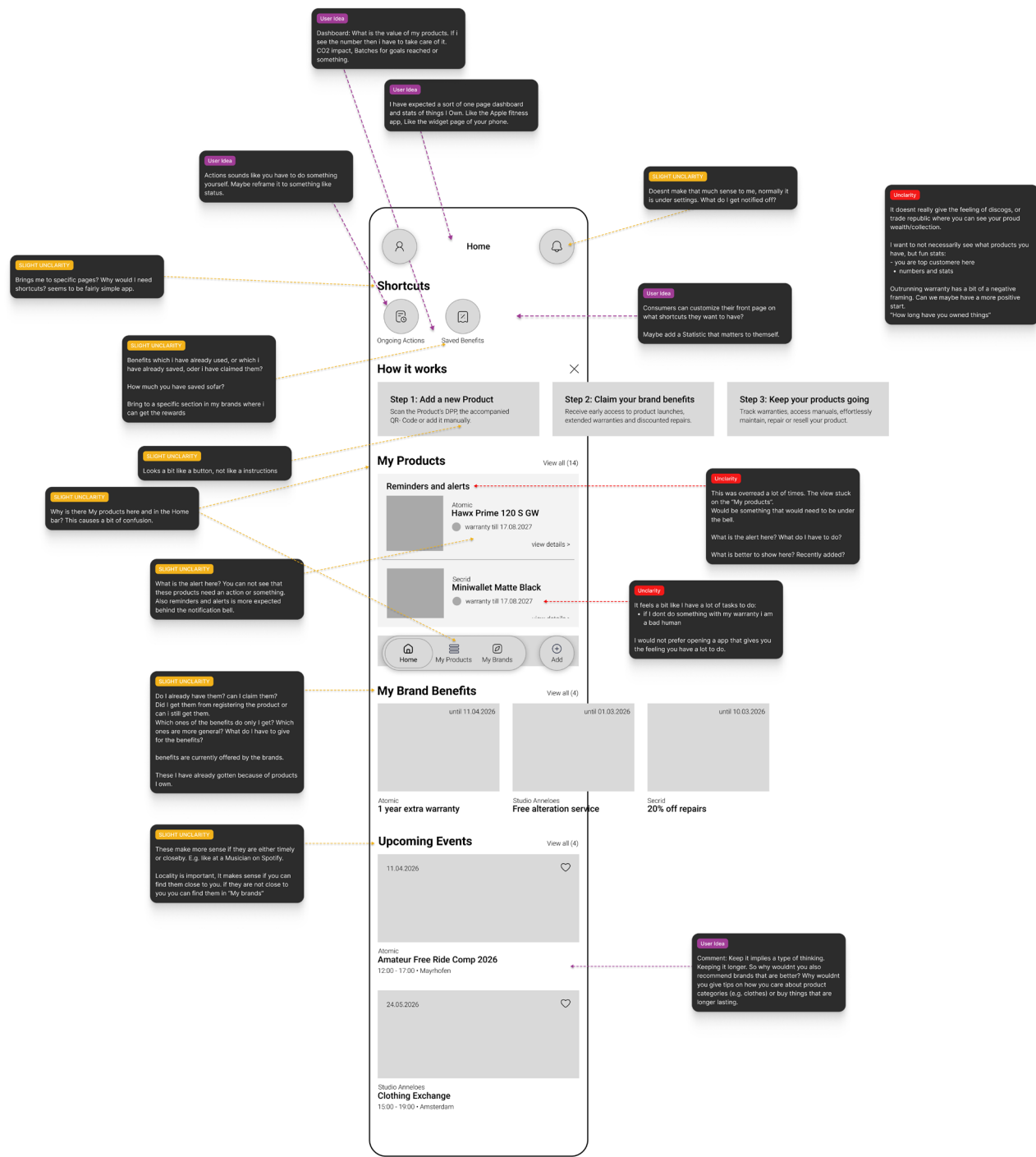
**Expectations of app interface**  
 Brought to the home  
 1. Empty page  
 2. Plus button adding a product  
 3. menu at the bottom:  
 a. Products page  
 b. settings page  
 c. Manuals/Insurances  
 d. Rewards

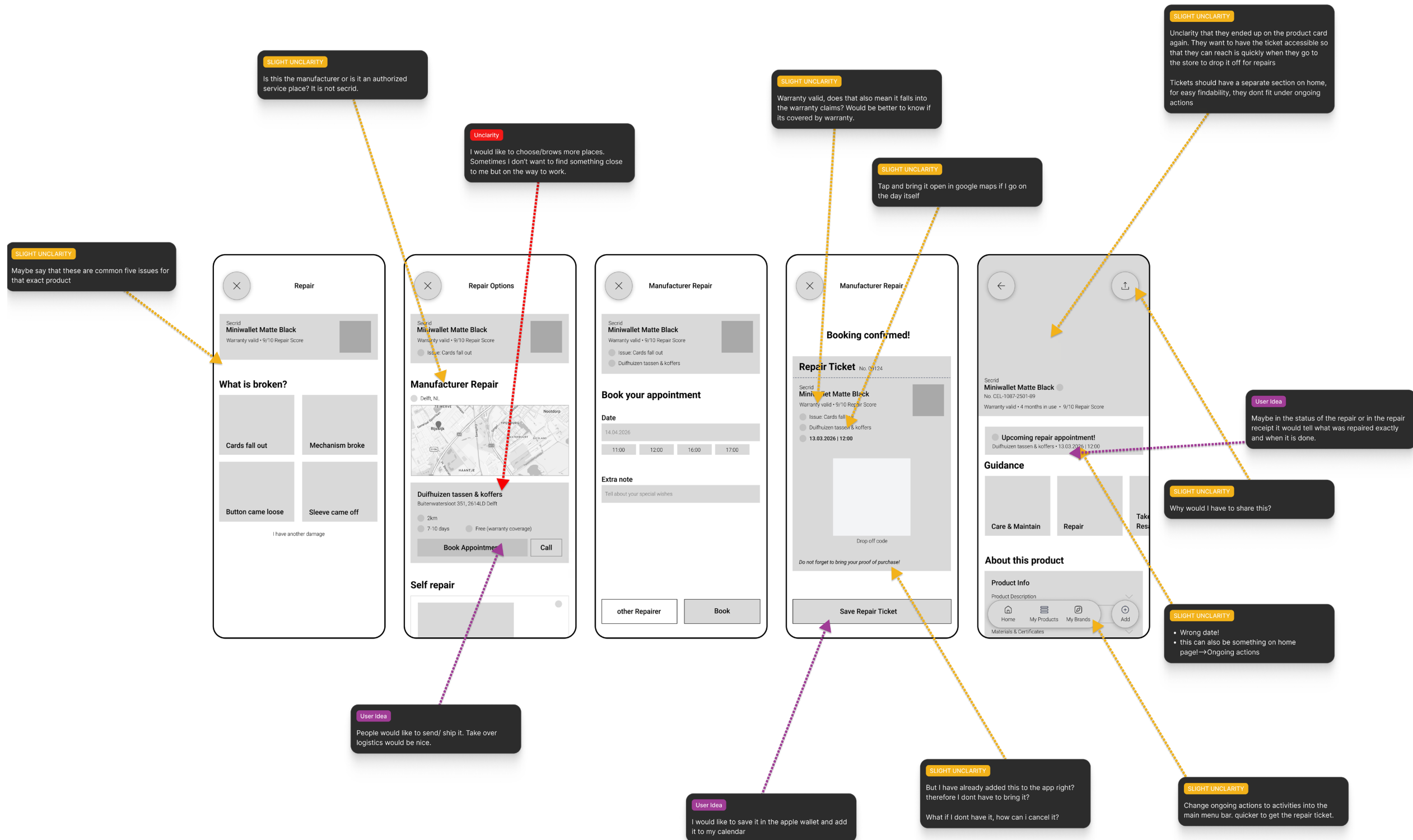
**Expectations of app interface**  
 Home is a Dashboard  
 • One way information, i dont think the app will tell you what to do (therefore not a whats new or a feed)  
 • Warranties that run up  
 • Status of a repair, transactions that you have done  
 • Reminders  
 • Camera/scan button is a central element of it.

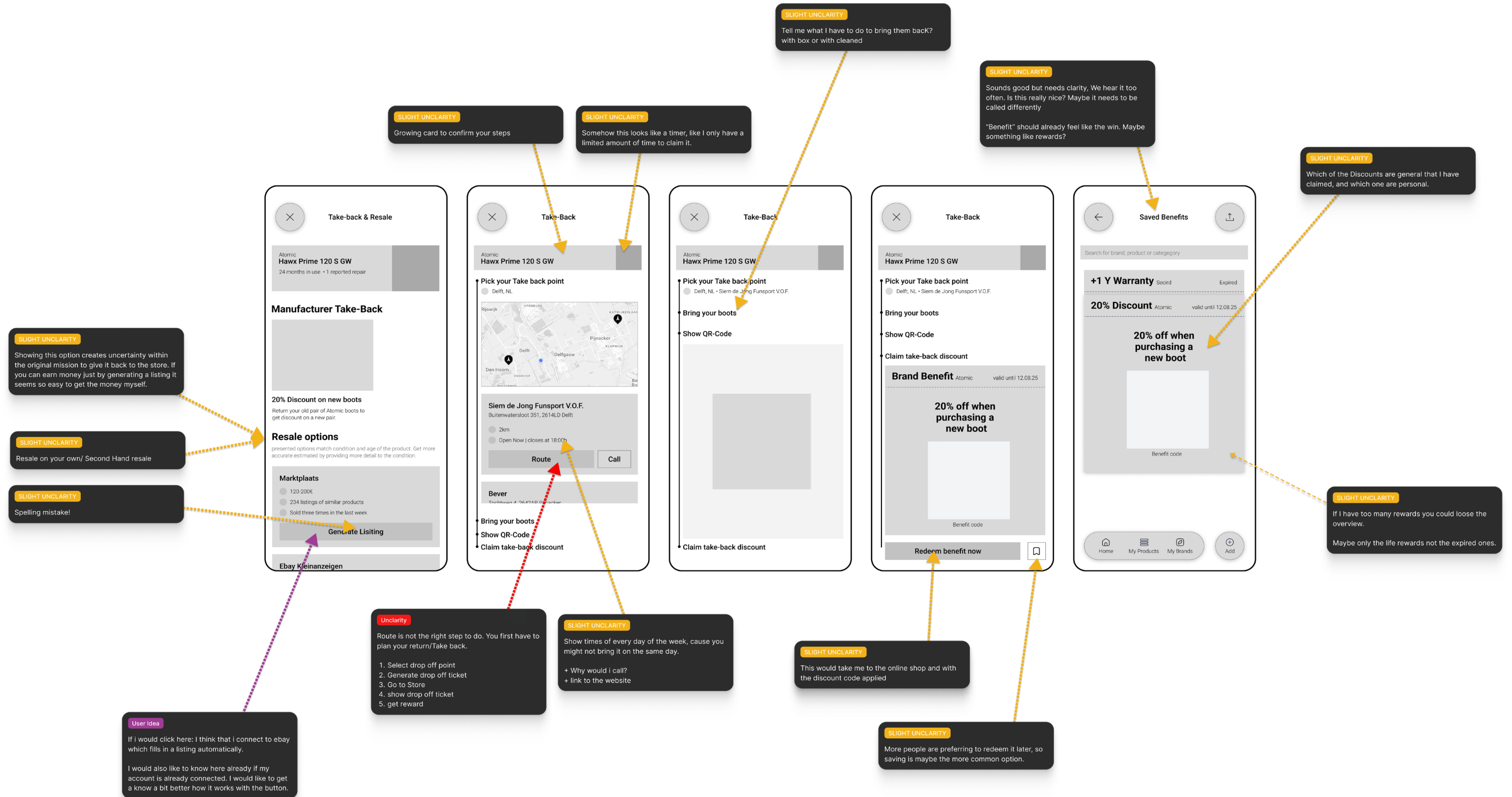
**Expectations of app interface**  
 • trade republic interface  
 • Products  
 • click on products and see individual specs and repair, resell manage.  
 • Dashboard with what you have, what you can do, new benefits.  
 • Maybe also a loyalty card showing what you can get for what points

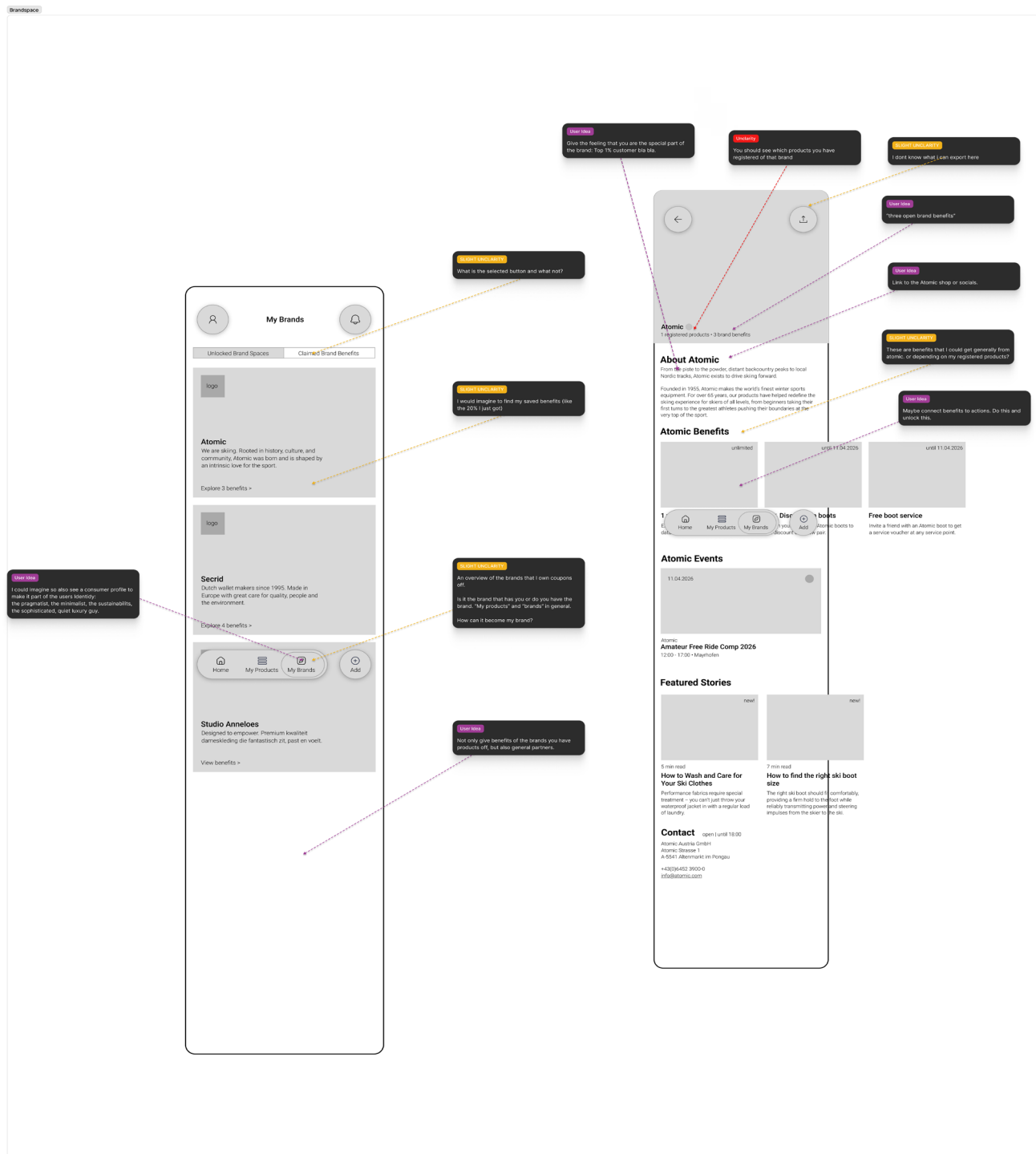
Adding Product











## 10.20 Interview guide - MVP validation

### Validation Interview Atomic (30mins)

#### Intro (2 Minutes)

Thanks for being available for this call Hubert! Like already hinted in the email I am also currently graduating at the TU Delft. My thesis revolves around Digital product passport and how the information in the passport can go beyond only informing and towards consumer getting into action, investing into keeping a product going.

Firstly, understand atomics standpoint towards circularity. I am curious to learn atomics' sustainability ambitions and what currently still the big challenges are. And secondly, I would love to briefly present my research and a potential outcome, that may represent a partial solution to some of the challenges you have.

#### Atomic's Sustainability effort (10-12 mins)

1. Maybe start by introducing yourself! Who are you, and what is your role at atomic?
2. What is ATOMIC's circular ambitions?
  - a. What are actions you take towards to reach that ambition?
  - b. What are challenges on the road towards reaching those ambitions?
3. How much do you know of the life of a ski boot after the sale
  - a. What are the product failure patterns that are most repaired?
  - b. You have a big Service network: How often is a ski boot repaired?
  - c. Do you have a sense of what your customers do with their boots after 3-5 seasons? Do they resell, store, or toss them?
4. Is Atomic thinking about making a DPP or something similar for their products?
  - a. If yes, what is the goal of that DPP?
  - b. If no, what is in the way to create one?

#### Presenting research & Concept briefly (10-12 mins)

1. Where do you see biggest advantages and challenges with this concept?
2. Would it partly solve the problems that you have towards your sustainable ambitions? In what way?
3. If this platform had 5000 atomic pairs of boots registered what information and interaction would make it valuable for atomic to join such a platform?
4. Is this something you'd want to keep the conversation going on - maybe once I have the next iteration?
5. If this was a startup, who would be the next person we should talk to within atomic to join a free pilot for such a platform?

## Validation Interview Secrid (30mins)

### Intro (2 Minutes)

Thanks for making time! As you know, your customer database and input have been a big part of shaping this research. Today I'd love to close the loop — first by briefly checking in on where SECRID stands with circularity and the DPP, and then showing you what the research and your customer data led to. I'm curious to hear if and how this could work for SECRID specifically.

### SECRID's current position (8-10 mins)

1. Since we last spoke, has anything changed in how SECRID thinks about circularity or product longevity?
2. What does the post-sale relationship with your customers currently look like?
  - a. Do customers reach out when something breaks — and what does that process look like?
  - b. Do you have visibility into how long people actually use their wallets?
3. Is SECRID already preparing for the DPP, or is it still on the horizon?
  - a. If yes, what's the main goal — compliance or something more?
  - b. If not yet, what would trigger you to start?

### Presenting research & concept (10-12 mins)

1. You've seen the consumer data from the survey — does this concept feel like a logical next step based on what your customers told us?
2. Where do you see the biggest value for SECRID specifically — the consumer side, the brand insights side, or both?
3. What would worry you about putting your products on a platform like this?
4. If 5000 SECRID wallets were registered on this platform, what would you want to see in a dashboard? What would make you check it regularly?
5. Would SECRID consider being a pilot brand to test this with real customers? What would need to be true for that to happen?
6. Who else internally should I speak with — product, marketing, customer service — to understand if this fits operationally?

## Validation Interview Studio Anneloes (30mins)

### Intro (2 Minutes)

Thanks for being available for this call Laura! Some time has passed since we last talked. After that I really focussed my thesis happens once a DPP exists - how do you get consumers to engage with it, turn information in actual actions and how that can create value for both the consumer and the brand.

I am almost done with my thesis, finetuning the outcome of my work. Today I would like to do two main things: Firstly, understand how the DPPs have evolved at Studio Anneloes. What success can already be celebrated and what challenges still exist. And secondly, I would love to briefly present my research findings, and a potential outcome, that may represent a solution to some of the challenges you have.

### Studio Anneloes's Sustainability effort (10-12 mins)

1. You've implemented DPPs – how has the actual scan rate evolved?
  - a. What are the next actions to increase the DPP engagement?
2. Do you have insights what your consumers scan the DPP for?
  - a. In an ideal world what would they do with it?
3. Does the DPP play a role with retravel now or are these separate?
  - a. What would be the benefit to integrate those two services?
  - b. Where do you see the biggest friction in the retravel service?
4. You've built the infrastructure - the DPP, a consumer touchpoint. What's the missing piece that would get consumers to use them?
  - a. What would make it more useful for you as a company?

### Presenting research & Concept briefly (10-12 mins)

1. Where do you see biggest advantages and challenges with this concept?
2. Would this solve part of the problems to engage with the consumer after-sales? And keep this engagement going?
3. If this platform had 5000 Studio Anneloes pieces registered what information and interaction would make it valuable for you to join such a platform?
4. If this was a startup, who would be the next person we should talk to partner in developing such a platform?

## 10.21 MVP validation - Researcher memo

### Atomic

#### - Sustainability ambitions and challenges

- Atomic has a Science Based Targets initiative (SBTi) with confirmed goals for 2030 and 2050, focusing on decarbonization and material impacts, which account for 80% of their footprint. They have successfully managed their own factory emissions (Scope 1 and 2) but face challenges regarding the 25% reduction target for 2030.
- Actions: They initiated a three-year national take-back pilot in Austria for winter sports equipment. They are also validating pilots for re-commerce and further take-back systems. Hindrances: The primary obstacle for recycling is the low price of virgin materials; for example, virgin PU costs 4€/kg, whereas recycled material from their take-back program costs 5-6€/kg. The main other issue is the lack of products that are returned. Returning more boots, ski sticks, or helmets would make the recycling or refurbishing more cost-efficient.

#### - DPPs

- Textile and footwear are coming into the legislation, but the rest is only from 2030 onwards. This is unfortunate because they have invested a lot in DPPs.
- They have already developed a similar system since 2012. Back then, it was developed to trace the supply chain. For now, the DPP will not do enough.
- Together with Salomon, they decided to proceed with the DPP topic. They moved further with Avery Dennison.
- Recurring problem: They cannot attach the product type (e.g. EAN Code) to the QR code because the product is decided with the last parts added to the product (similar to Secrid).
- Successively, all products will get a QR code.

#### - MVP thoughts

- Atomic is preparing the back-end structure for DPPs to work.
- Atomic is getting a new PIM, Digital Asset Management, and B2C is new. There is no capacity.
- “Exactly something like Keep It I see, now also the first time in a very tangible way, as the right way to move forward. It would simplify and converge everything finally together.”
- “He does not see that they themselves get to a state for such an app in 2026.”
- “The benefit of a platform like this [...] is data from consumers. We are a B2B company, meaning we have no connection to the consumer.”
- “The key question is how do we motivate the consumer to scan the QR. Maybe with 1 year extra warranty, rewards, or other services.”
- “I would say that this concept fits into our upcoming recommerce strategy. This could be one of the channels that we can use to let our customers connect with our recycle or refurbish partners and get back a reward. We will definitely need something like this app to realize this strategy.”
- “I will also need such a platform for the recycling company. We have to trace that a product is returned at a specific place to close the loop.”
- “We can definitely do a pilot to test the app with Atomics’ early DPPs. [...] We do not have all data yet and still need to look at the delegated acts to determine what data to gather, but for existing products for sure.”

### Secrid

#### - Secret Circularity ambitions

- Want to develop a DPP that does not lack engagement with their consumer group. Therefore, they are focussing on enabling actions instead of showing information.
- DPP Data is there on different places in the company but has to be brought together.
- DPP Involves a lot of internal departments (Digital (Front and backend), Production, Company strategy) all of which have their own agenda. Makes it hard to start DPPs as a project and make place in their timeline. Especially there is not a direct ROI connected to it.
- Product model is defined in the last assembly process (which leather is put around), which makes it hard to add a DPP on the product itself.
- Secret’s main revenue comes from Retailers. Only a part goes directly over their own online shop.
- They have a registration code over which consumers can sign up for an e.g. newsletter and fill in a form for an extra year of warranty. But it lacks personal value to actually analyse and embed the data in an actionable way in the organization.

#### - MVP thoughts

- “For the consumer, I think the value lies in not needing an app for each and every brand that you own. Combined with the elements in the app that give overview and engagement of consumers to keep products, such as rewards and how much products you own in money.”
- “For Secret, it is mainly the direct connection to the consumer that is of value.”
- “Does it enable something that wasn’t possible before? I don’t necessarily think so, because we also have newsletters, or people can find a repair point online. But it will be way easier to reach more consumers in a more direct way. If you are not on there as a platform, you almost get FOMO, because it makes keeping the connection to consumers so low effort, something that now is more difficult right now.”
- “We really want to offer services to our products. However, until now, there is a gap of a Secrid Service team; they would probably own and manage the keep it partnership.”
- “From a sustainability perspective, we want to know about how much is repaired and on products.”
- “But you can also go deeper and analyse failure patterns and on product model level to optimize and improve products for the product development department.”
- “Secrid can notify people if you have a new circular service.”
- “Secrid can also sell add-ons that upgrade products.”
- “Before we can join such a platform, we have to have the DPP data and the QR code on the product. But I also think that keeping it can help with that: If a brand thinks how to make their own DPP “Keep it ready,” then keeping it can support them with a template for DPPs.”
- “If a brand has a DPP connection with Keep it, it can also give insights over if it is compliant or not.”
- “How do you keep it up to date? Maybe you are also selling products or discarding them?”

## Studio Anneloes

## - Circular Ambitions:

- They do repair as a basic service.
- They want to start using the DPP more like a service tool. For the future, they would like to integrate the DPP in the takeback options and repairs. There is so much to make easier with the DPP.
- The DPP may also support our retravel resale platform. If you register your product, you can immediately upload it, and you don't need to fill out anything besides the condition.
- Retravel is not a profitable business model yet. We offer it from the sustainability perspective. We believe that our products can have 4-5 owners. The goal is also to make it more profitable for the consumer.
- Last year, they sold over [REDACTED] over their retravel platform.
- We need both more people selling and buying to make it profitable.
- Research with 4 different DPP call to actions: The one that performed the best was “how to style this”. “The consumer is not yet interested in where does my product come from, who made it, what material is it. Honestly, I don't think they care.”
- The development of the DPP is now on a slower pace. But we are now developing a “shop the look” version of the DPP for higher engagement.

## - About Keep It

- We are developing the DPP ourselves to access this kind of data the Keep It App promises to provide. So from a brand perspective, not directly clear added value.
- It depends a bit on how much information and data we can get ourselves.
- On the other hand, if something like Keep It exists, the question is whether we have to develop all these service functions in our own DPP. That could make it easier for us. Maybe talk with DPP services providers as an add-on solution.
- Marketing/User Data will be most worth it if we join such a platform. Build consumer profiles.
- From a sustainability perspective, it is interesting to see how much a piece is worn.
- From the consumer perspective, I can clearly see the value. Especially in the future where DPPs are all around you.
- “Consumers will not always scan the QR code every time that you need information. It is very handy to have that all in place.”
- Accessibility to circular services. Services have to be easily available. Keep it makes it easier to access the DPP because you do not need to scan it over and over again.

## 10.22 Thesis project brief




**Personal Project Brief – IDE Master Graduation Project**

Name student Tim Henrik EckertStudent number 6070310**PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT**

Complete all fields, keep information clear, specific and concise

Project title Creating consumer value to drive adoption of Digital Product Passport Technology

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

**Introduction**

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

Product consumption in the linear economy—where consumers buy, use, and dispose of goods—has been identified as a major contributor to the depletion of the Earth's resources and the transgression of planetary boundaries, posing irreversible threats to ecosystems and human well-being (Rockström, 2009). In response, the Circular Economy (CE) aims to decouple economic growth from resource use and environmental harm by circulating products and materials at their highest value for as long as possible (Kirchherr et al., 2023). As part of its ambition to achieve climate neutrality by 2050, the European Commission (EC) has adopted the Circular Economy Action Plan (CEAP) as a central element of the European Green Deal.

A cornerstone of CEAP is the Digital Product Passport (DPP), introduced under the Ecodesign for Sustainable Products Regulation (ESPR) (European Parliament & Council of the European Union, 2024). The DPP is positioned as a key technological enabler supporting circular strategies by facilitating access to trustworthy and governed product-specific information across value chain actors (see Figure 1). Battery and textile goods on the EU market will be mandated to have a DPP in 2027 via delegated acts. If adopted by all stakeholders, the DPP technology promises to make individual and organizational decisions and practices more sustainable and to enable end-to-end product tracking, ultimately closing the loop and offering the door to circular business models.

Recognized as a decision node and link in the product life cycle (see Figure 1), the consumer takes a central role and relevance in enacting circular strategies and has therefore high responsibility in making more sustainable decisions.

Viewing the consumer as customer, user, and end-of-life product holder (Shevchenko et al., 2023) recognizes the still most widely spread, traditional ownership model but also outclodes emerging, e.g. sharing or subscription models.

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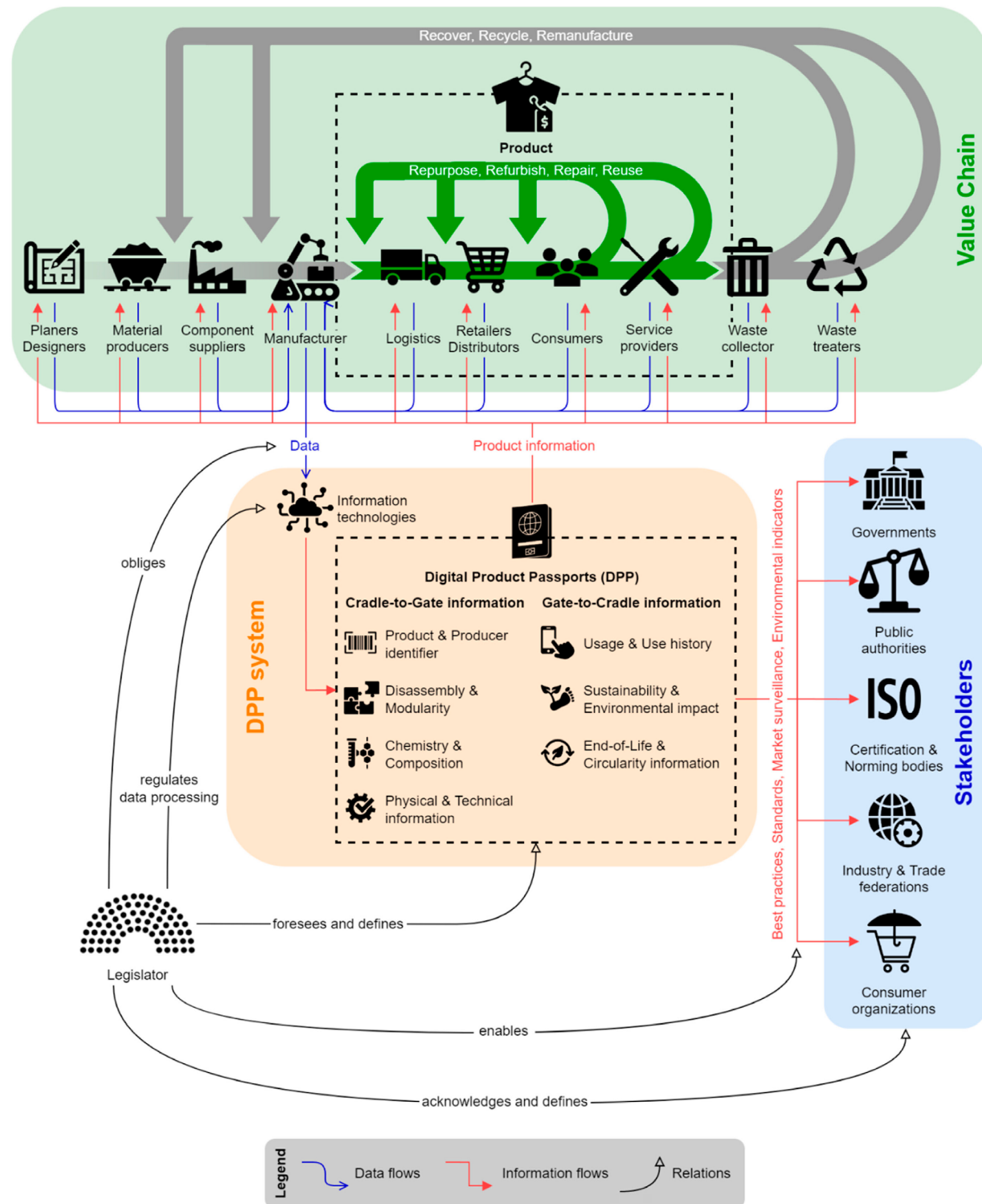


Figure 1: Overview of the DPP ecosystem including the value chain participants, the DPP system, and the other stakeholders (Ducuing et al. 2023)





**Personal Project Brief – IDE Master Graduation Project**

**Problem Definition**

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice. (max 200 words)

DPPs are technological enablers for the circular economy that facilitate product-specific data sharing along product life cycle actors. While technological solutions (feasibility) and new business opportunities (viability) for product manufacturers are extensive subjects of studies, the role and relevance of the consumer - and whether it solves real problems identified in consumer behavior and circular economy literature (e.g. resale authenticity, access to repair information, warranty management, and sustainability claims) - remains largely unknown. The EU's adoption challenge can be seen as a symptom of this: if consumers do not experience value they will not engage with the DPP. Understanding how the DPP can create consumer value is therefore pivotal for a successful transition to a circular economy. This is underlined by the consumers' position as a central decision node and product conduit to end-of-life actors (see Figure 1) as well as recognized in CE literature (e.g. Grafström & Aasma, 2021; Zimmermann et al., 2024). Next to a loss of momentum in the transition to a circular economy, a neglect of the consumer could also evolve into a substantial financial problem for EU and manufacturers, which are investing heavily in acquiring information and setting up IT architectures. Involving consumers in the research adds a hitherto unaddressed stakeholder to the DPP scientific literature. Further, it adds value in form of DPP value creation mechanisms that can inform manufacturers, service providers, and end-of-life actors. And lastly, consumer needs are heard, and meaningful solutions towards a circular economy are created.

**Assignment**

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

Investigating and conceptualizing propositions that create real consumer value to drive adoption of the Digital Product Passport technology in the context of the European Circular Economy transition.

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

Do get to the desired outcome the project sets off by identifying existing consumer problems and risks in enacting circular strategies through literature. Mapping these problems on a circular product life cycle and addressing them with the capabilities of the Digital Product Passport as a lens will result in "DPP enabled Consumer Stories". These will be validated by DPP experts. Using wallets as a case study, a consumer research with Secrid's consumer test base will explore how consumers perceive these problems and evaluate the potential value of DPP-enabled solutions through a survey and follow-up interviews. While grounded in the wallet category for feasibility, the findings will be reflected upon for their cross-category relevance within the broader DPP ecosystem.

In the second phase, insights will be translated into value propositions and validated through co-creation and prototyping. Performing this second phase in an entrepreneurial manner, without company involvement, aims to ensure realistic real-world impact. Value Propositions are prioritized based on direct implementability (reflecting on the uncertainty of the DPPs shape), its created consumer value, and surrounding market dynamics. Finally, a prototyped conceptual MVP or a service concept will mark the end of the thesis.

**Project planning and key moments**

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting, mid-term evaluation meeting, green light meeting and graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).

Make sure to attach the full plan to this project brief. The four key moment dates must be filled in below

**Kick off meeting** 29.09.2025

**Mid-term evaluation** 12.12.2025

**Green light meeting** 13.03.2025

**Graduation ceremony** 10.04.2025

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	<input checked="" type="checkbox"/>
For how many project weeks	25
Number of project days per week	4

Comments:  
4 Days per week thesis, 1 Day per week at SECRID.

**Motivation and personal ambitions**

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five. (200 words max)

I am deeply concerned about humanity's future on this planet and the irreversible damage climate change causes. Personally, I see two routes that can at least slow down the crushing of one planetary boundary after the other. We can either change our self-designed social constructs, complex constructs that evolved with humanity and are engrained and entangled in how we see life, work, and everything around us. Or we manage to decouple our constructs from environmental depletion. I have been fascinated by the question of how sustainability and economic viability in our pre-existing constructs can be combined. If we manage to make the most sustainable option the most viable option for companies and consumers, sustainability is no longer something that only environmentally aware people do, but everybody does (inspiring example is the app ToGoodToGo).

At Accenture I was introduced to the concept of circular economy, the EU Green Deal, and the Digital Product Passport (DPP) as part of the ESPR. I understood that the DPP could be an answer to this question. Therefore, in my thesis, I want to explore how the DPP can go beyond data dumping towards actually creating meaningful consumer value by addressing real needs and risks, embedded in a circular ecosystem.

My professional experience in user experience design and the acquired knowledge in the SPD Master, specifically business model innovation, scientific research, and branding, enable me to pursue this project holistically. I aim to gain more experience in designing a MVP with a circular business model and enacting it with an entrepreneurial mindset.