

APPENDIX

REPAIR PRACTICES IN LUXURY ELECTRONICS:

A holistic product-service-system to improve repair practices of B&O headphones in the luxury electronics market targeting the new generation.

By Ester van Voskuilen



CONTENT

1.	Definitions	4
2.	Products Of B&O	5
3.	Choice Products	6
4.	Barriers - Sources	8
5.	Barriers Explained	10
6.	Incentives - Sources	14
7.	Incentives Explained	16
8.	Survey Questions	18
9.	Coding Open Question: Warranty	26
10.	Coding Open Question: Repair	28
11.	Harris Profile - Requirements Round 1	30
12.	Harris Profile - Persona Values Round 1	32
13.	Harris Profile - Requirements Round 2	34
14.	Harris Profile - Persona Values Round 2	36
15.	User Verification Slide Deck	38
16.	Concept Structure	48
17.	Implementation Planning	50

1. DEFINITIONS

Term/abbreviation	Definition
B&O	Bang & Olufsen – A Danish luxury electronics company known for high-end audio and design products.
C2C	Cradle to Cradle – A design philosophy focused on creating circular, modular products with low environmental impact, enabling full reuse or recycling.
CB	Consumer Behaviour – The study of how individuals make decisions to use, maintain, or dispose of products and services, including the emotional and practical drivers of those actions.
Care-level DIY	A light-touch, guided form of user repair where simple maintenance (e.g. replacing cushions or batteries) is safe, approved, and supported by brand-provided resources.
DIY	Do-It-Yourself – Refers to repairs or maintenance actions performed by users themselves, often with tools, instructions, or kits from the brand.
EU	European Union – Mentioned in the context of regulations and policies that promote sustainable product design and the right to repair.
Fogg Behavior Model	A behavioral framework stating that Behavior = Motivation × Ability × Prompt. It helps explain why users act (or don't) in relation to repair services.
Gen Z	Generation Z – Individuals born approximately between 1997 and 2012, forming part of B&O's emerging target group.
HNWI / VHNWI	(Very) High Net Worth Individual – A customer classification based on wealth. (V)HNWI refers to people with significant financial resources, often targeted in luxury marketing.
Luxury	A combination of structural, psychological, and social drivers—including quality, exclusivity, identity expr
New Generation	Refers to younger consumer segments (Gen Z and young Millennials) with evolving expectations around sustainability, ownership, and identity.
Persona	A fictional but research-based representation of a user archetype. Used to design services that align with different customer values, behaviours, and needs.
Product Life Extension	Strategies and services that prolong the usable lifespan of a product, such as repair, maintenance, upgrades, or reuse.
PSS	Product-Service System – A combined offering of physical products and supporting services, designed to deliver value in a user-centered, often circular way.
Schwartz Value Theory	A theory identifying 10 core human values (e.g. security, self-direction, universalism) that guide individual behaviour. Used to understand value-driven engagement with repair.
Sustainable Consumption	Awareness and behaviour that considers the long-term impact of personal consumption choices on the natural and social environment.

2. PRODUCTS OF B&O



HEADPHONES



PORTABLE/ SMALL HOME SPEAKERS



FLOOR STANDING/ ARCHITECTURAL SPEAKERS



SOUNDBARS AND TELEVISIONS

3. CHOICE PRODUCTS

Name	From	Price	Category	Subcategory	Size	Pricerange	Complexity	Good choice
BEOSOUND A5		€ 1.199,00	Speaker	Portable speaker	+	+	++	++
BEOSOUND 2		€ 3.199,00	Speaker	Home speaker	+	-	+	0
BEOSOUND A9		€ 3.499,00	Speaker	Home speaker	-	-	+	-
BEOSOUND EXPLORE	From	€ 249,00	Speaker	Outdoor bluetooth speaker	++	++	+	++
BEOSOUND A1 2ND GEN		€ 299,00	Speaker	Portable bluetooth speaker	++	++	0	0
BEOSOUND BALANCE	From	€ 2.999,00	Speaker	Living room speaker	++	-	+	+
BEOLIT 20		€ 599,00	Speaker	Bluetooth speaker	++	++	++	++
BEOSOUND EMERGE		€ 899,00	Speaker	Compact wifi home speaker	++	++	+	++
BEOSOUND LEVEL	From	€ 1.499,00	Speaker	Portable wifi speaker	++	+	++	++
BEOLAB 8	From	€ 5.498,00	Speaker	Compact speaker	++	-	+	+
BEOLAB 18	From	€ 8.599,00	Speaker	Artistic stereo	0	--	0	-
BEOLAB 28	From	€ 16.500,00	Speaker	Hi-Res wireless stereo	0	--	0	-
BEOLAB 50	From	€ 53.500,00	Speaker	Floor standing speaker	0	--	0	-
BEOLAB 90	From	€ 140.000,00	Speaker	Floor standing speaker	-	--	-	--
BEOSOUND SHAPE	From	€ 5.198,00	Speaker	Modular, wall-mounted	-	-	-	-
BEOGRAM 4000C		REQUEST	Speaker	LP player	+	-	0	0
BEOSYSTEM 9000C	From	€ 50.000,00	Speaker	CD player-speaker	--	--	--	--
BEOSOUND BOLLARD	From	€ 1.999,00	Speaker	Integrated outdoor speaker	+	+	0	+
BEOLAB 19	From	€ 4.000,00	Speaker	Wireless subwoofer	+	-	0	0
CELESTICAL		-	Speaker	Integrated ceiling speaker	+	-	0	0
PALATIAL		-	Speaker	Integrated wall speaker	+	-	0	0
BEOPLAY H100		€ 1.499,00	Headphone	Over-ear headphones	++	+	+	++
BEOPLAY EX		€ 399,00	Headphone	Wireless earbuds	-	++	--	-
BEOPLAY HX		€ 599,00	Headphone	Do-it-all headphones	++	++	+	++
BEOPLAY H95		€ 999,00	Headphone	Over-ear headphones	++	++	+	++
BEOPLAY EQ EARBUDS		€ 239,00	Headphone	Additional earbuds	-	++	-	-
BEOPLAY EQ CHARCHING CASE		€ 199,00	Headphone	Extra charging power	-	++	0	0
BEOSOUND STAGE	From	€ 2.099,00	Soundbar	Soundbar	0	-	+	0
BEOSOUND THEATRE	From	€ 949,00	Soundbar	Soundbar	0	++	+	0
BEOVISION HARMONY	From	€ 18.950,00	Televsion	Television	--	--	-	--
BEOVISION THEATRE	From	€ 13.700,00	Televsion	Television	--	--	-	--
BEOVISION CONTOUR	From	€ 7.150,00	Televsion	Television	--	--	-	--

4. BARRIERS - SOURCES

Barrier	Category	Sonego et al. (2022)	Ackermann et al. (2018)	Roskladka et al. (2023)	Bovea et al. (2017)	Sabbaghi & Behdad (2018)	López Dávila et al. (2021)	Mrad et al. (2025)	Svensson-Hoglund et al. (2020)	Rudolf et al. (2022)
Availability of repair services	Access			•	•		•			•
Communication and awareness	Access	•			•			•		
Availability of spare parts	Availability	•		•		•				•
Tools for repair	Availability		•	•		•				
Costs of repair	Costs	•	•	•	•	•	•			•
Guarantee	Costs						•	•		
Perceived value	Costs								•	
Time, effort and convenience	Effort	•	•	•	•	•		•		•
Repair process	Effort									•
Habit	Effort		•							
Knowledge and information - DIY	Information	•	•	•		•	•		•	•
Knowledge and information - repair service	Information			•			•	•	•	•
Compare repair options	Information						•			•
Knowledge and information - purchase decisions	Information	•						•		
(Planned) obsolescence	Obsolescence	•	•	•					•	
Up-to-date / desire for new products or features	Obsolescence		•	•					•	
Temporary solution	Obsolescence		•							
Low-quality products	Obsolescence			•						
Trust in repair services	Quality			•			•	•		•
Quality of repair	Quality	•		•						•
Prior experience	Quality	•						•		
Emotional - Fear of failure	Quality			•						
Unawareness	Unawareness			•						
Emotional - attachment	Attachment		•	•						
Emotional - Personal identity	Attachment		•						•	
Emotional - shared ownership	Attachment		•							
Modularity and repairability	Design	•	•	•		•			•	•
Diagnostics	Design			•						
Safety risk	Design			•						
Legislation	Regulation			•						•
Promotion of repair	Regulation			•						•
Company prohibits repair	Obstruction		•						•	
Digital locks	Obstruction			•						

5. BARRIERS EXPLAINED

(Based on definitions and explanations of: Sonogo et al. (2022), Ackermann et al. (2018), Roskladka et al. (2023), Bovea et al. (2017), Sabbaghi & Behdad (2018), López Dávilla et al. (2021), Mrad et al. (2025), Svensson-Hoglund et al. (2020), Rudolf et al. (2022). See Table 2)

Category	Barrier	Explanation
		Access
Explanation		Availability
Access	Availability of repair services	Limited availability of repair services, such as repair cafes, DIY hubs, or specialized service centres, and their unsuitable locations contribute to the challenge. Consumers often don't know where to take their electronic devices for repair, and the few available options may be too far away or inconvenient to access.
Access	Communication and awareness	Poor communication from companies and lack of experience leaves consumers unaware of repair options or locations, leading to misconceptions that certain products, like luxury items and electronics, cannot be repaired. Misleading claims, such as implying warranties are voided after unauthorized repairs or disassembly, further discourage the use of repair services, despite legal protections such as the EU Consumer Sales and Guarantees Directive, which claim this is only possible if the intervention caused the fault. This lack of information and awareness creates significant barriers to accessing repair services.
Availability	Availability of spare parts	Access to spare parts is essential for repairs, with their availability, quality, and price strongly influencing consumer decisions to repair. They must remain accessible throughout the product's lifecycle, including after the end of production, as limited access, unavailability, or high costs discourage repairs and negatively impact perceptions of repairability.
Availability	Tools for repair	Consumers often lack the necessary tools for performing repairs or enhancing their repair skills, such as tutorials or guides. Proprietary or non-standard tools required for specialized fasteners further complicate repair efforts. Issues with tool quality, including material durability, inappropriate sizing, lack of multifunctionality, poor ergonomic design, and safety concerns, also hinder repairability. Additionally, the unavailability of required repair tools creates significant barriers to successful repair activities.
Costs//value	Costs of repair	Repair costs include the price of the repair service, spare parts, and labour, with spare parts often perceived as particularly expensive. Consumers compare these costs to the price of a new product and the additional lifespan a repair might provide to assess its value. Products outside warranty typically have higher repair costs, discouraging repairs. For cheaper products or those with outdated functionalities, the relatively high costs and limited expected use life further reduce the appeal of repair. Consumers are often more willing to spend a higher amount of money on the purchase (which communicates quality, an incentive for repair) than on spare parts or repair.
Costs	Guarantee	Consumers may face significant repair costs or be unable to access repair services for their products if the device is not covered by a guarantee or if the guarantee period has expired. This is particularly risky for luxury products.
Costs	Perceived value	Consumers do not give equal value to refurbished and repaired items as they do to new, even if quality and lifetime are equal
Effort// inconvenience	Time, effort and convenience	Repair processes often demand significant time and effort, including locating a repair service, waiting for parts, and shipping items to specialized workshops. Long repair times leave consumers without their product, causing inconvenience and discouraging repairs, particularly for luxury brands. Many consumers avoid repairs if the process feels complex or inconvenient, preferring instant gratification and seamless solutions.
Effort	Repair process	A complicated repair process makes it hard for consumers to start, and finish the repair process
Effort	Habit	If you don't do it often, it is not part of your rhythm and will take more effort to do it
Information	Knowledge and information - DIY	Consumers often lack access to adequate repair manuals and technical information. Missing or unclear engineering definitions, diagrams, and instructions prevent them from understanding how to maintain or repair their products. This lack of information, combined with insufficient repair skills, particularly for electronics and software, creates a fear of causing further damage. As a result, many consumers feel unprepared to attempt DIY repairs or maintenance, limiting their ability to address issues independently.
Information	Knowledge and information - repair service	Insufficient knowledge about repair services and product repairability result in a prejudiced belief that certain products are irreparable, discouraging attempts to fix them. Consumers often struggle to identify where to take their products for repair or how the process works, in addition to a lack of clarity (upfront) about repair costs, difficulty, and timeframes, which further deters engagement with repair services. Also, many are unaware of their legal repair rights, such as warranty policies or the right to repair. Improved awareness could lead to better product care.
Information	Compare repair options	Consumers face challenges in comparing repair prices due to the lack of accessible information and attractive repair offers.
Information	Knowledge and information - purchase decisions	Being unaware of the repair services and right to repair can restrict a consumer in evaluating a product's repairability and thus future repair options when making a purchase decision. Improved awareness could lead to better purchase decisions.

Obsolescence	(Planned) obsolescence	Obsolescence refers to the real or perceived loss of a product's value, causing consumers to justify purchasing a new product. This is often fuelled by a throwaway culture and consumers' preference for owning the latest products, even when current ones are still functional. Companies contribute by discontinuing services for older models and focusing on newer ones. Planned obsolescence involves deliberately designing products with shorter lifespans, using low-quality materials, or integrating irreplaceable components, resulting in premature functional failure and encouraging frequent replacement.
Obsolescence	Up-to-date - desire for new products or features	Consumers are often driven to replace rather than repair products that are outdated or incompatible with modern technologies. Functional obsolescence, such as software incompatibility or security risks, makes older products less appealing. Fast product cycles and pressure to stay "up-to-date" with trends or newer features further disfavour repair. Practices like "software doping," which limit compatibility with third-party spares or older models, exacerbate the issue, encouraging replacement over repair.
Obsolescence	Emotional - Temporary solution	Products that are perceived as annoying or fail to provide enjoyment tend to receive less care and maintenance. Their perceived lifespan is often limited due to a lack of attachment, plans for future replacement, or external factors that lower their value or usability.
Obsolescence	Low-quality products	Product designs that incorporate low-quality or fragile materials can lead to decreased robustness. This can result in potential issues such as corrosion, wear, and reduced fatigue resistance, making the product more prone to damage over time.
Quality	Trust in repair services	Consumers often lack trust in repair services due to uncertainty about the quality and transparency of repairs. There is a fear of being overcharged and doubts about whether genuine parts are used. Many consumers are concerned that they cannot monitor the repair process, highlighting the need for greater transparency. Additionally, concerns about the security of private data stored in products further undermine trust in repair services.
Quality	Quality of repair	The quality of repair services can be unpredictable, leading to consumer mistrust. Manufacturers' restrictions on independent repairs can reduce the quality of work from these services, which is vital for consumer loyalty. A lack of care, responsiveness, and empathy in after-sales service, driven by short-term sales targets, discourages consumers from using these services. Additionally, doubts about the durability of repairs contribute to low trust in repair quality.
Quality	Prior experience	Consumers may develop a negative relationship with a brand due to high repair costs, long wait times, poor service, and low-quality repairs. These negative experiences can create frustration and alter their perception of the brand. Damaged products can evoke strong negative emotions, such as disgust, and if issues are not addressed, consumers may reconsider their loyalty and ongoing relationship with the brand.
Quality	Emotional - Fear of failure	Consumers often hesitate to repair products due to the fear of potential further failures and recurring issues. Previous failed repair attempts contribute to this apprehension. This fear of continued problems discourages repair efforts and reinforces a preference for replacement over maintenance.
Unawareness	Unawareness	Consumers often lack awareness of the impact of repairs and the importance of prolonging product lifespans. This includes insufficient knowledge about their rights, available repair options, and the benefits of repair over replacement. Additionally, a general absence of repair habits and norms further reinforces the preference for replacing rather than maintaining products.
Attachment	Emotional - attachment	A lack of emotional attachment to a product reduces the likelihood of repair, as consumers find it easy to replace or abandon the item. When consumers feel tired of a product or see it as easily replaceable, they are less motivated to invest in its repair.
Attachment	Emotional - Personal identity	Products that no longer align with a consumer's lifestyle or values, or represent an unsustainable way of consumption, may lead to reduced care and motivation to repair them. Additionally, peer influence can play a role, as social circles may encourage the abandonment of older products in favour of newer ones that better reflect shared values or trends.
Attachment	Emotional - shared ownership	When a product is shared between multiple owners, individual responsibility can decrease, resulting in less attention and effort being put in the maintenance of the product
Design	Modularity and repairability	Products often lack repairability due to non-modular designs, complex product architectures, and lengthy disassembly processes, like highly integrated designs with inaccessible or undetachable components, unclear repair methods, and problematic closures like glues or welds. Some products are unopenable without causing damage, while others rely on customized parts and proprietary tools, complicating the process further. This can lead to mistakes, assumptions of irreparability, and reduced potential for maintenance, upgrades, or fixes.
Design	Diagnostics	Consumers face challenges in identifying errors and diagnosing issues due to the complexity of breakdown possibilities and the difficulty of predicting them. Embedded software systems often do not allow users to visualize technical product characteristics or display clear malfunction descriptions on the device or through connected apps, further complicating the diagnostic process.
Design	Safety risk	Consumers may face safety risks due to missing instructions and precautions related to electrical, chemical, thermal, and mechanical hazards, and the use of toxic materials in products.
Regulation	Legislation	A lack of initiatives and fiscal incentives, such as tax reductions, hinders the promotion of repair activities. Regulatory restrictions imposed by manufacturers limit third-party repair services, and original equipment manufacturers are not legally required to produce durable or repairable products.
Regulation	Promotion of repair	Insufficient leadership, awareness, and media influence hinder interest in repair. Current legislation and political actions are not effective in promoting repair practices or driving change.
Obstruction	Company prohibits repair	Consumers may be denied repair services due to company policies that favour offering a replacement product instead, even when the consumer would prefer or accept a repair. This practice discourages repair behaviour and undermines consumer autonomy in deciding the fate of their products.

6. INCENTIVES SOURCES

Applying reparability restriction such as digital rights management copyright and digital security systems, with usage terms forbidding unauthorized repairs or modifications of software-enabled products

Barrier	Category	(Sonego et al., 2022)	(Ackermann et al., 2018)	(Mrad et al., 2025)	(Atlason et al., 2017)	(Kadic-Magljajic et al., 2019)	(Brand et al., 2022)	(Makov & Fitzpatrick, 2021)
Aesthetics	Aesthetics		•	•				
Emotional attachment	Attachment	•	•	•				
Fit with participant's identity	Attachment		•					
Luxury products	Attachment			•				
Personal data	Attachment	•						
Environmental	Awareness	•			•	•		
Cost-benefit	Costs	•	•	•				
Cost-saving	Costs							•
Guilt alleviation	Costs			•				
Pay for environmental positive	Costs				•			
Saving money	Costs		•					
Time an effort	Effort		•					
Time trigger	Effort			•				
Perceived inaccessibility to luxury products	Exclusivity			•				
Uniqueness	Exclusivity		•			•	•	
Social triggers	External influence		•					
Knowledge and skills	Information					•	•	
Labels	information						•	
Transparency and accountability	Information	•						
Extended use of appliances	Obsolescence	•						
High quality: up-to-date	Obsolescence	•						
High quality: workhorse/ functionality	Obsolescence		•					
Rebellion against the brand policy	Obstruction		•					
Challenge -based approach	Personal motivation		•	•		•		
Enjoy experience	Personal motivation		•					
Feeling of pleasure or pride	Personal motivation					•		
Intrinsic motivation	Personal motivation	•	•					
Value	Personal motivation		•					
Positive prior experience	Quality		•	•				
Good relationship with customer	Relationship	•	•	•				

7. INCENTIVES EXPLAINED

Category	Inventive	Explanation
Aesthetics	Appearance	Participants value timeless, aesthetically pleasing products that maintain their appeal over time, motivating them to take better care of these items. They are more likely to repair products that resist trends and remain relevant, as these are seen as worth preserving. While some delay repairs until significant defects appear, others proactively address minor issues, such as scratches, to maintain the condition and longevity of their luxury items.
Attachment	Emotional attachment	Consumers repair products due to emotional attachment, positive memories, perceived high performance, or the joy they provide. Even if not financially practical, the emotional value, particularly for luxury or investment items with inheritance significance, makes these products feel irreplaceable.
Attachment	Fit with participant's identity	Product represents consumer's lifestyle
Attachment	Luxury products	Consumers perceive luxury products as those that transcend their functional aspects and tap into the emotional and symbolic features that they hold for consumers
Attachment	Personal data	Personal data on the device can be a motivator for repair, but also a barrier
Awareness	Environmental reasons	Consumers may not always prioritize environmental reasons when deciding to repair products. However, effective communication that highlights the benefits of reuse and remanufacturing, such as conserving resources, can encourage action. Eco-certifications play a key role in boosting user confidence in sustainable choices. Emotional intelligence (EI) enhances individuals' connection to sustainability issues, helping them translate awareness into actionable behaviours. Those with higher EI are better equipped to manage the emotional trade-offs of sustainable consumption, and their active engagement with sustainability is a strong predictor of pro-environmental and pro-social actions.
Costs	Cost-benefit	Consumers are more inclined to repair high-value or luxury items perceived as investment pieces, as they see these as worth repairing. In contrast, inexpensive or low-value items are more likely to be replaced, especially if repair costs exceed their acceptable threshold.
Costs	Cost-saving	Repair can be a cost-saving alternative to replacement, particularly for minor issues like battery degradation
Costs	Guilt alleviation	Previous studies indicate that most consumers experience feelings of guilt because they have bought expensive products that are harder to justify than necessities (e.g., Jeong and Koo, 2015). Consumers are inclined to buy value-oriented products rather than luxury ones because frugality is their default norm. In other words, consumers may perceive buying luxury products as a breach of their socio-moral standards.
Costs	Pay for environmental positive	Gender differences indicate that women are more willing to pay a premium for products with environmental advantages
Effort	Time an effort/ convenience	Consumers are more likely to adopt sustainable behaviours when they have enough time and access to convenient services like door-to-door collection.
Effort	Time trigger	Regular care activities, independent from the actual state of the product, or because of regulations
Exclusivity	Perceived inaccessibility to luxury products	1) objective and artificial rarity imposed by the brand itself by limiting the number of items provided and 2) the buyer's financial inability to replace the item.
Exclusivity	Uniqueness	The desire for uniqueness motivates consumers to repair luxury products, as it aligns with their intrinsic drive to differentiate themselves through the consumption and display of distinctive items.
External influence	Community engagement, social triggers	Social networks and mutual support within communities addressing environmental and social issues act as strong motivators. Positive reinforcement, such as social approval or visible results, encourages continued engagement in sustainable behaviours. Influence of the social environment, such as family or friends
Information	Knowledge and skills	Consumer knows how to take care of the product, or interest in gaining more knowledge and skills (but may not have had enough time for it), also depends on the skill (cleaning vs repair)
Information	Labels	Sustainable labels and certifications, such as eco-labels and social labels, act as trust signals that encourage sustainable purchasing by providing consumers with confidence in the product's environmental and social impact.
Information	Transparency and accountability	Clear information about the manufacturing process and country-of-origin is highly valued
Obsolescence	Extended use of appliances	The life cycle of the product can be extended. But the lifetime is also depended on the novelty of the product.
Obsolescence	High quality: up-to-date	Linked to self and social identity, update due to changes in trends and technology rather than malfunction
Obsolescence	High quality: workhorse	Needed in life, considers the additional lifetime acquired by repair // high functionality and therefore regular use of the product
Obstruction	Rebellion against the brand policy	Consumer's reaction as the brand tries to prohibit them from repairing their products, for instance if they want to repair it themselves and request help, or when their product falls out of warranty
Personal motivation	Challenge -based approach	Consumers want to try out what they can do by themselves and where their personal boundaries are
Personal motivation	Feeling of pleasure or pride	Even if they can do task themselves, some participants use services because they really enjoy the experience and are happy with the result// Repairing luxury products provides a sense of pleasure, pride, and achievement, as it is seen as a transformative process that overcomes challenges. This fosters self-fulfilment, personal growth, and emotional satisfaction, further incentivized by the reward of contributing to a larger cause through life-extending practices.

8. SURVEY QUESTIONS

Question	Source	Measuring metrics	Results
Here we briefly describe some people. Please read each description and think about how much each person is or is not like you. Tick the box to the right that shows how much the person in the description is like you.	Schwartz (n.d.)	Likert scale: Very much like me – not like me at all	<p>Cluster analysis:</p> <p>Cluster 1: The ethical innovator (54/257 – 21%)</p> <p>Strongly values sustainability in environmental and social ways, but also values self-direction and stimulation, meaning this persona wants to participate in repair, but needs to enjoy the process.</p> <p>Cluster 2: The urban jetsetter (70/257 – 27.2%)</p> <p>Strongly values achievement and hedonism, as well as self-direction, stimulation, power and security, meaning this persona wants to show their success and ability resulting in prioritizing replacement over repair if that can give them more value. Services should provide a VIP experience to make them an option.</p> <p>Cluster 3: The responsible guardian (75/257 – 29.2%)</p> <p>Strongly values security, being humble, and sustainability, meaning this persona will prioritize repair over replacement from a sustainability point of view, as well as the drive to extend the product life time of the product they have invested in.</p> <p>Cluster 4: The rational customer (50/257 – 19.5%)</p> <p>No real strong values, but similar priorities to the ethical innovator, meaning they will participate in repair when it is simple and convenient, but will not get inspired by big statements targeting specific values.</p>
What is the brand of the headphone you primarily use?		Multiple choice	<p>Bang & Olufsen 85</p> <p>Sonos 1</p> <p>Beats by Dre 11</p> <p>Bose 18</p> <p>Other 15</p> <p>Apple 68</p> <p>Logitech (Ultimate Ears - UE Boom) 2</p> <p>Sennheiser 11</p> <p>Bowers & Wilkins 4</p> <p>Anker (Soundcore) 3</p> <p>JBL 4</p> <p>Sony 17</p> <p>Audio-Technica 2</p> <p>HyperX 2</p> <p>Denon 2</p> <p>Samsung 6</p> <p>Razer 1</p> <p>Cambridge Audio 1</p> <p>Shure 1</p> <p>Plantronics (Poly) 1</p> <p>Focal 1</p>

What is the model of your primarily used B&O headphone?	Multiple choice	Beoplay H95 24 Beoplay H9i 12 Beoplay H100 6 Beoplay HX 8 Beoplay H6 1 Beoplay H9 9 Beoplay Portal 10 Beoplay H8 5 Beoplay H8i 1 Beoplay H4 1 Other 8
Do you use your B&O headphone at least once every 2 weeks?	Yes or no	Yes (85)
How do you store your B&O headphone?	Multiple choice	I put my headphone in the storage case/pouch 47 I let my headphone lay around 26 I put my headphone in my backpack/suitcase/other bag 2 Other: 10 Headphone stand 5 Underside table or case/pouch 1 Lay around or case/pouch 1 Desk 1 Drawer 1 Specific place 1
What is your motivation for owning a B&O headphone? (multiple answers possible)	Multiple choice, multiple answers possible	Great sound quality 25,7% Beautiful design 22,6% High quality materials 22,9% Product is easy to use 11,5% Brand aligns with my values 9,2% Luxury status of the product 5,3% Other 3,1%
Do you look up the warranty details including when it ends when you buy a new headphone?	Multiple choice	Yes, but only how long it is applicable 66 Yes 105 No, I forget to look into it 34 No, I don't really care 22 Yes, but I don't do anything with it 29
Would you like to comment?	Open field	
Have you ever had an issue with your B&O headphone?	Yes or no	Yes 39 No 46
Give details about the issue.	Open field	Other 6 The product is out of warranty 4 I expect a low quality of repair service 1 The repair costs are relatively high compared to new product 1 There are newer/better products on the market 1 I want to repair myself (DIY) 3 The process takes a lot of time and effort 2

Did you contact customer care about your issue?	Yes or no	Yes 21 No 18
How did you contact customer care?	Multiple choice	Through the B&O website 13 Through a B&O store 6 Through the App 2 Through social media (Facebook, Instagram, WhatsApp) 0
Was the issue fixed?	Multiple choice	No 5 Yes, by replacing the product 12 Yes, by resetting the product to factory settings 1 Yes, by repairing the product 3
How did you experience the repair process?	Open field	
Which reasons have been a reason for you to NOT get your product repaired?		Through the B&O website 13 Through a B&O store 6 Through the App 2 Through social media (Facebook, Instagram, WhatsApp) 0

Rank these reasons for repair from most important (1) to least important (11)

Statement	1	2	3	4	5	6	7	8	9	10	11
Mean	8,168	6,43	6,227	5,102	5,809	5,203	5,711	4,105	7,582	6,527	5,137
Median	9	7	6	5	6	5	6	4	8	7	5
Mode	11	11	9	1	6	3	8	1	10	11	1
Average	9,389	8,143	7,076	3,701	5,936	4,401	6,57	3,035	8,527	8,176	3,712

Rank these reasons to NOT repair from most important (1) to least important (12)

Statement	1	2	3	4	5	6	7	8	9	10	11	12
Mean	5,906	6,238	3,816	5,746	5,742	6,063	7,547	8,32	6,82	8,113	8,219	5,469
Median	6	7	3	5,5	6	6	8	9	7	9	9	5
Mode	4	7	1	6	6	2	11	12	6	12	12	1
Average	5,302	6,746	2,605	5,749	5,914	4,688	8,849	9,773	6,607	9,704	9,74	3,823

What product life extending activities would you do/have you done for a headphone (€1000, life expectancy 8 years) after 2/5 years of owning it? (multiple answers possible)

Multiple choice

- Answer 2y - 5y
- Replace the battery 22% - 30%
 - Replace the ear cushion/ headband cushion 28% - 29%
 - Repair a part when it is not working anymore 27% - 25%
 - Depends, if there are better/ newer products on the market 04% - 13%
 - I will buy that one
 - Replace part of casing to a different colour 07% - 01%
 - Nothing, I will use it until it doesn't work anymore and buy a new one 05% - 05%

Answer the following questions about a headphone of €1000, 8 year life expectancy, after 5 years

Van Westendorps Price Sensitivity Meter

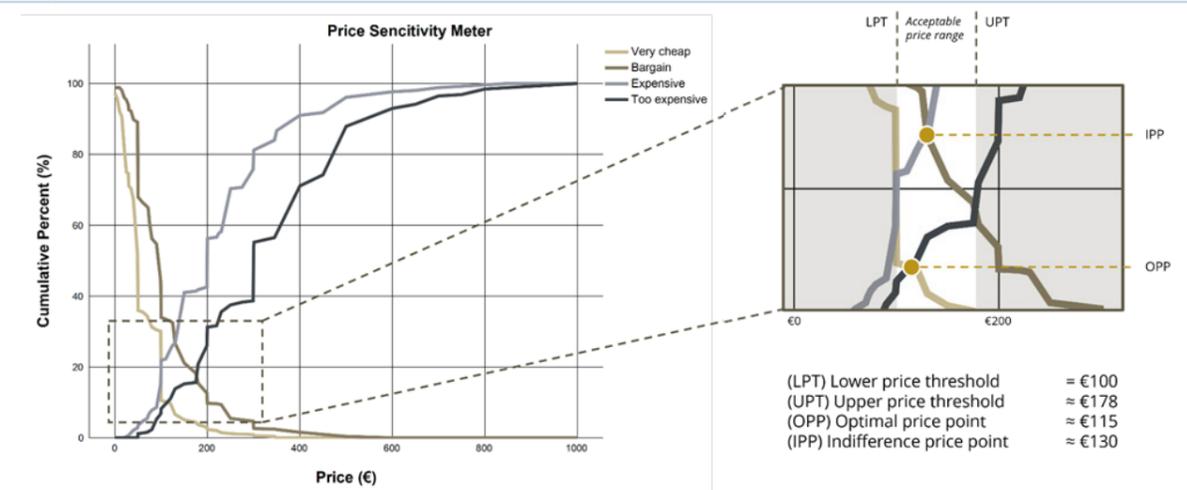
a "At what price would you consider a repair action to be so expensive that you would not consider doing it?"

b "At what price would you consider a repair action to be priced so low that it would be a no-brainer to do it?"

c "At what price would you consider a repair action starting to get expensive, so that it is not out of the question, but you would have to give some thought to start it?"

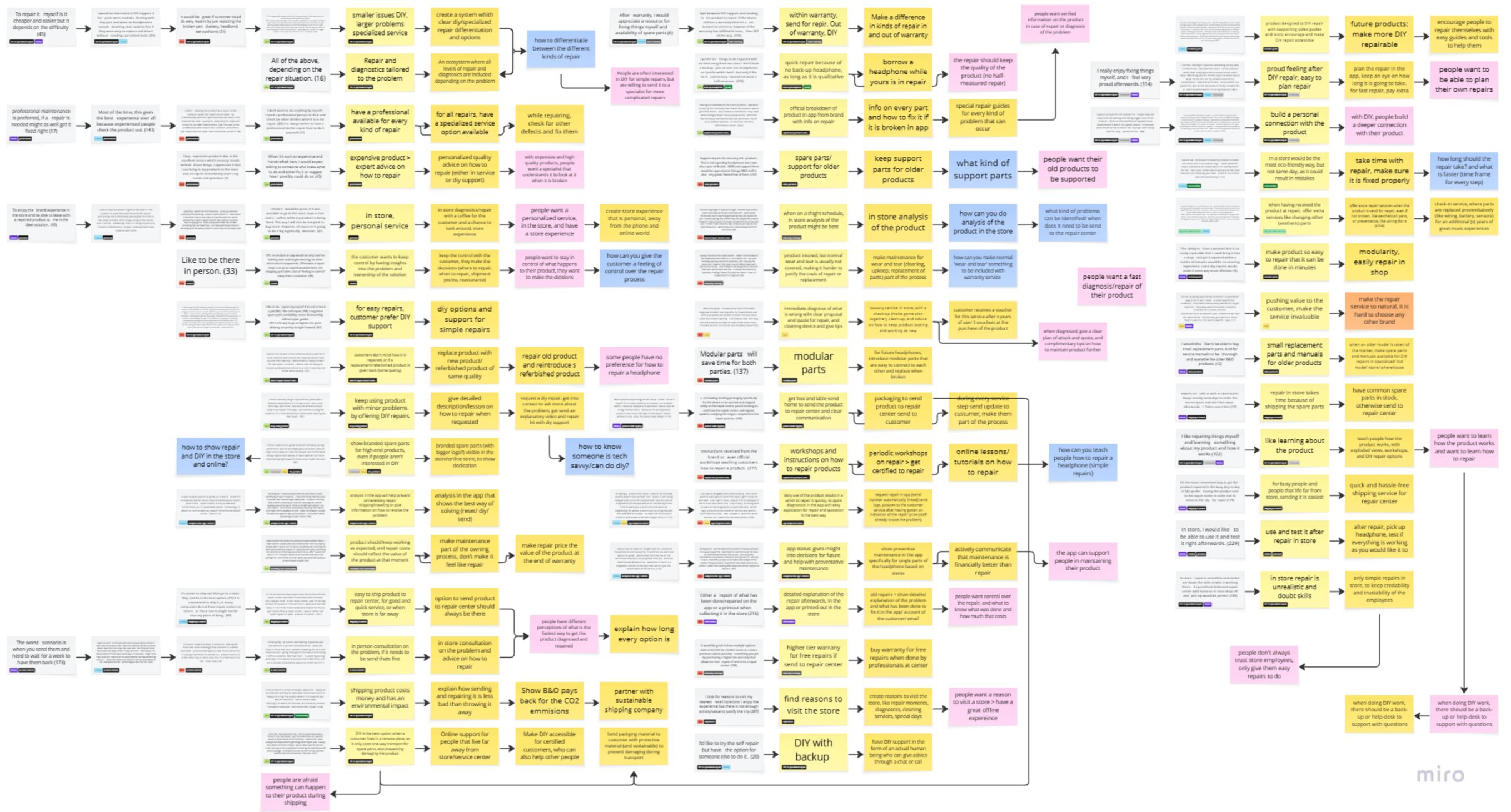
d "At what price would you consider a repair action to be a bargain—a great buy for the money?"

What maintenance or repair services would you be interested in?



- DIY support 92
- In store repair while you wait 59
- Replacement of a small part 15
- Send product to repair center 64
- Analysis of the whole product in the app 21
- Other 5 (all of the above)

10. CODING OPEN QUESTION: REPAIR



11. HARRIS PROFILE - REQUIREMENTS ROUND 1

Requirements	CONCEPT 1				CONCEPT 2				CONCEPT 3				CONCEPT 4			
	--	-	+	++	--	-	+	++	--	-	+	++	--	-	+	++
Brand and identity alignment																
R1 The solution should make repair feel just as premium and intentional as the ownership experience.		•					•					•				•
R2 The solution should reflect Bang & Olufsen's craftsmanship and brand tone across all service levels.			•				•					•				•
R3 Communication should be consistent across physical and digital touchpoints.				•				•				•				•
Sustainability																
R4 The solution should encourage repair instead of replacement, even after the warranty ends.				•				•				•			•	
R5 Repair should be framed as a meaningful, responsible action that aligns with B&O's environmental values.				•				•				•				•
R6 It should support long-term use, both functionally and aesthetically.				•				•				•			•	
Communication and transparency																
R7 The value, cost, and options for repair should be clearly communicated throughout the product's life.			•				•				•					•
R8 Information like warranty coverage and timelines should be easy to access and understand.				•				•				•				•
R9 The tone of communication should be flexible, adapting to different user preferences and levels of involvement.		•						•				•				•
R10 Users should be able to choose between hands-on DIY or effortless premium service.		•						•			•			•		
R11 Personalization based on user preferences, tone, and lifestyle should be supported.			•					•				•			•	
User alignment																
R12 The solution should reflect the values and expectations of the new generation of users: choice, flexibility, and everyday integration.			•					•				•			•	
R13 Repair and care should be easy to fit into daily life, not something users avoid or forget.			•					•			•			•		
R14 For ethical innovators, the process should feel enriching, transparent, emotionally engaging, and aligned with responsible ownership.				•				•		•					•	
R15 For urban jetsetters, the experience should remain premium: low-effort, high-quality, and optionally upgradable, while giving them control and confidence.		•						•				•				•
Product-service system																
R16 The solution should offer flexible, low-effort service options that feel worth it.		•						•			•				•	
R17 Repair should be accessible and convenient, fitting into users' routines.			•					•			•			•		
R18 Maintenance should be integrated into the ownership experience, not just something that happens when things break.				•				•			•			•		
R19 The system should scale across product types and repair complexities, with multiple service				•				•			•			•		•
	0	-5	7	14	0	0	7	24	0	-1	6	24	0	-4	6	18
	16				31				29				20			

12. HARRIS PROFILE - PERSONA VALUES ROUND 1

Requirements	CONCEPT 1				CONCEPT 2				CONCEPT 3				CONCEPT 4			
	--	-	+	++	--	-	+	++	--	-	+	++	--	-	+	++
Ethical innovator																
Emotional factors:																
· Attachment: personal connection to the product, by taking care of it				•				•				•				•
· Trust: ethical and transparent business practices			•				•				•				•	
· Awareness: sustainability is important				•				•			•					•
· Obsolescence: product still functions satisfyingly, opportunity for innovation and excitement				•			•					•				•
· External influence: peer norms influence repair behaviour				•			•				•				•	
· Aesthetics: reflects personal taste and creative identity				•				•			•				•	
· Motivation: exploration and self-direction				•				•		•					•	
Practical factors:																
· Access: enables sustainable behaviour, autonomy and exploration				•				•			•				•	
· Information: transparency supports trust and informed, responsible decisions, in addition to knowing all possibilities			•					•				•				•
· Design: know where the parts come from, spare parts and modularity improves repair				•			•				•				•	
· Obstruction: blocking repair limits freedom and responsible ownership.				•				•				•				•
Urban jetsetter																
Emotional factors:																
· Obsolescence: Wanting the newest and best product, with an option for innovation and upgrading			•				•					•				•
· Aesthetics: beautiful products enhance self-image, and reflects personal taste			•				•				•					•
· External influence: peer norms influence status and social image				•				•			•				•	
· Motivation: pride and fulfilment link to personal achievement and success				•				•				•			•	
Practical factors:																
· Price of repair: expect effortless ownership		•					•				•				•	
· Effort: hassle is unacceptable		•					•				•				•	
· Exclusivity: maintain exclusivity and status		•					•				•				•	
· Access: autonomy			•					•				•				•
· Information: knowing the options			•					•			•					•
· Obstruction: blocking repair limits freedom and responsible ownership.				•				•				•				•
	0	-3	6	24	0	0	9	24	0	-1	10	20	0	-3	7	22
	27				33				29				26			

13. HARRIS PROFILE - REQUIREMENTS ROUND 2

Requirements	CONCEPT 1				CONCEPT 2				CONCEPT 3			
	--	-	+	++	--	-	+	++	--	-	+	++
Brand and identity alignment												
R1 The solution should make repair feel just as premium and intentional as the ownership experience.		•					•					•
R2 The solution should reflect Bang & Olufsen's craftsmanship and brand tone across all service levels.				•				•				•
R3 Communication should be consistent across physical and digital touchpoints.			•					•				•
Sustainability												
R4 The solution should encourage repair instead of replacement, even after the warranty ends.				•				•				•
R5 Repair should be framed as a meaningful, responsible action that aligns with B&O's environmental values.				•				•				•
R6 It should support long-term use, both functionally and aesthetically.				•				•				•
Communication and transparency												
R7 The value, cost, and options for repair should be clearly communicated throughout the product's life.				•				•				•
R8 Information like warranty coverage and timelines should be easy to access and understand.			•					•				•
R9 The tone of communication should be flexible, adapting to different user preferences and levels of involvement.			•					•		•		
R10 Users should be able to choose between hands-on DIY or effortless premium service.				•				•		•		
R11 Personalization based on user preferences, tone, and lifestyle should be supported.			•					•		•		
User alignment												
R12 The solution should reflect the values and expectations of the new generation of users: choice, flexibility, and everyday integration.			•					•		•		
R13 Repair and care should be easy to fit into daily life, not something users avoid or forget.		•						•		•		
R14 For ethical innovators, the process should feel enriching, transparent, emotionally engaging, and aligned with responsible ownership.				•				•		•		
R15 For urban jetsetters, the experience should remain premium: low-effort, high-quality, and optionally upgradable, while giving them control and confidence.			•				•					•
Product-service system												
R16 The solution should offer flexible, low-effort service options that feel worth it.			•					•		•		
R17 Repair should be accessible and convenient, fitting into users' routines.				•				•				•
R18 Maintenance should be integrated into the ownership experience, not just something that happens when things break.			•					•		•		
R19 The system should scale across product types and repair complexities, with multiple service			•				•			•		
	0	-2	9	16	0	0	3	32	0	-3	6	20
	23				35				23			

14. HARRIS PROFILE - PERSONA VALUES ROUND 2

Requirements	CONCEPT 1				CONCEPT 2				CONCEPT 3			
	--	-	+	++	--	-	+	++	--	-	+	++
Ethical innovator												
Emotional factors:												
· Attachment: personal connection to the product, by taking care of it				•				•			•	
· Trust: ethical and transparent business practices				•				•				•
· Awareness: sustainability is important				•				•			•	
· Obsolescence: product still functions satisfyingly, opportunity for innovation and excitement				•			•				•	
· External influence: peer norms influence repair behaviour			•				•			•		
· Aesthetics: reflects personal taste and creative identity				•				•		•		
· Motivation: exploration and self-direction				•				•			•	
Practical factors:												
· Access: enables sustainable behaviour, autonomy and exploration				•				•			•	
· Information: transparency supports trust and informed, responsible decisions, in addition to knowing all possibilities			•					•				•
· Design: know where the parts come from, spare parts and modularity improves repair				•				•			•	
· Obstruction: blocking repair limits freedom and responsible ownership.				•				•				•
Urban jetsetter												
Emotional factors:												
· Obsolescence: Wanting the newest and best product, with an option for innovation and upgrading				•			•			•		
· Aesthetics: beautiful products enhance self-image, and reflects personal taste				•				•				•
· External influence: peer norms influence status and social image				•			•				•	
· Motivation: pride and fulfilment link to personal achievement and success			•				•				•	
Practical factors:												
· Price of repair: expect effortless ownership		•					•					•
· Effort: hassle is unacceptable			•				•					•
· Exclusivity: maintain exclusivity and status		•					•					•
· Access: autonomy				•				•			•	
· Information: knowing the options			•					•				•
· Obstruction: blocking repair limits freedom and responsible ownership.				•				•				•
	0	-2	5	28	0	0	8	26	0	-3	9	18
	31				34				24			

15. USER VERIFICATION SLIDE DECK

INSTRUCTIONS

- Zeg wat er in je opkomt
- Antwoord naar jouw waarheid, geen sociaal verantwoorde antwoorden nodig ;)
- Er zijn geen foute antwoorden
- Als je ergens een vraag over hebt, kan je die elk moment stellen
- Have fun!



B&O - TU Delft

Thesis: Repair practices in Luxury electronics

2

IMAGINE...

Je wordt binnenkort 30, je hebt een goede baan en je wilt jezelf verwennen met een nieuwe koptelefoon.

Na wat rondkijken valt je oog op de nieuwe B&O koptelefoon van €1000.



B&O - TU Delft

4

INSTRUCTIONS

- Ik vertel steeds een stukje verhaal, waarna jij een keuze moet maken over hoe het verder gaat
- Denk hardop
 - Wat voor emotie voel je bij je keuze?
 - Waarom heb je deze keuze gemaakt?
 - Hoe voel je je over de andere opties?
- Aan het einde zal ik nog een paar vragen stellen om alles af te sluiten



B&O - TU Delft

Thesis: Repair practices in Luxury electronics

3

IMAGINE...

Je doet wat onderzoek online, gaat naar de winkel, test de koptelefoon, and you fall in love!

Wat een prachtig product, mooi geluid en goede service.



B&O - TU Delft

5

1. Welke informatie let je op voordat je de koptelefoon koopt?



1.
Koptelefoon zelf, hoe werkt die, kwaliteit



2.
Krijg je waarde voor je geld



3.
Modulariteit



4.
Oorkussens kunnen makkelijk vervangen worden



5.
Lengte van de garantie (3-5 jaar), en wat het inhoudt



6.
Reparatiemogelijkheden voor voor en na garantie

B&O - TU Delft

6

GEFELICITEERD

Je hebt een gloednieuwe B&O koptelefoon. Het is prachtig verpakt en komt met een QR code voor de app. Ook zitten er kleine schoonmaakdoekjes en een korte care-guide bij.



B&O - TU Delft

8



2. Zou je extra producten meebestellen?



1.
€39,99
Care-kit met schoonmaakmiddel, ontvetter, leerbehandeling, microvezeldoekjes en een care-guide



2.
€50-€200
Vorbereiding, alvast nieuwe onderdelen voor de koptelefoon voor als die gaan slijten



3.
€0
Niks, het zal allemaal wel goed komen, aangezien het een hoge kwaliteit is

B&O - TU Delft

7

3. Wat zou je doen?



1.
Care-reminders (maandelijks) aanzetten en tips doorlezen op de app



2.
Informatie doorlezen over hoe ik mijn koptelefoon het beste kan verzorgen



3.
Nog een app? Dit komt later nog wel een keer

B&O - TU Delft

9

1 JAAR LATER...

Je bent nog steeds super blij met je koptelefoon. Je maakt hem af en toe schoon en zorgt ervoor dat hij netjes blijft.



B&O - TU Delft

10

4. Wat zou je doen?



1.
€0 - 15 min
Je opent de app, en volgt een snelle DIY check



2.
€0 - 1 uur
Je gaat naar de dichtstbijzijnde winkel, waar het personeel een snelle check doet, terwijl jij een kop koffie krijgt



3.
€0 - 0 uur
Negeren. Er is niks mis met mijn koptelefoon en ik heb het veel te druk

B&O - TU Delft

12

1 JAAR LATER...

Je ontvangt een berichtje van B&O: 'Tijd voor een snelle check-up'.



B&O - TU Delft

11

OH NEE...

Na 4 jaar heb je het idee dat de oorkussens een beetje zijn versleten. De garantie is nog steeds actief.

Je merkt dat je de oorkussens makkelijk los kan halen. Ook kan je makkelijk nieuwe bestellen (€149)



B&O - TU Delft

13

5. Wat zou je doen?



1.
€149 – 5 min
Makkelijk zelf te vervangen, niet eens een tutorial voor nodig



2.
€149 – 1 uur
Je gaat naar de dichtstbijzijnde winkel, waar het personeel je helpt met het vervangen en je koptelefoon schoon maakt



3.
€0 – 0 uur
Negeren. Het is niet zo'n grote issue, hij werkt nog prima en je kan er amper wat van zien

6. Wat zou je doen?



1.
€0/€? – 1 hour
Doe de check-up, het is toch gratis en zorgt ervoor dat mijn koptelefoon in goede staat de na-garantietijd in gaat



2.
€? – 5 min
Check-up? Handig. Maar ik koop ook vast de nieuwe onderdelen met korting, zodat ik ze makkelijk zelf nog een keer kan vervangen.



3.
€8/mnd – 5 min
Gratis check-ups en korting op reparaties klinkt wel goed



4.
€0 – 0 uur
Er is niks mis met mijn koptelefoon. Zolang die nog werkt zal het wel goed komen.

NA 5 JAAR

Zonder dat je het doorhebt, is de garantie bijna voorbij. B&O stuurt een bericht met een optie om een gratis check-up te doen en korting op bepaalde onderdelen, zoals oorkussens en de batterij. Ook is er een optie voor een abonnement voor extra bescherming.



NA 7 JAAR

Je koptelefoon werkt nog steeds, behalve dat hij niet altijd goed verbinding maakt met nieuwe apparaten, en je kan zien dat hij wat ouder is.



7. Wat zou je doen?



1.
€? - 7 dagen
Ik stuur hem naar reparatie,
want ik heb toch korting!



2.
€? - 7 dagen
Ik stuur hem naar reparatie,
want het is betaalbaar en de
prijzen zijn duidelijk



3.
€0 - 5 min
Ik blijf hem gewoon
onderhouden, totdat hij het echt
niet meer doet



4.
€1000 - 1 dag
Ga hem binnenkort wel
vervangen voor een betere

8. Welke andere onderdelen zou je interessant vinden?



Care tutorials



Product dashboard



Care kit and refill



Season guides



Spare parts



Product care guide



Clear information



Product repairs (centre)



Pre-diagnostics



Personal support



Fair and clear pricing



Gift card



Personalized messaging



Product receipts



Repair receipts

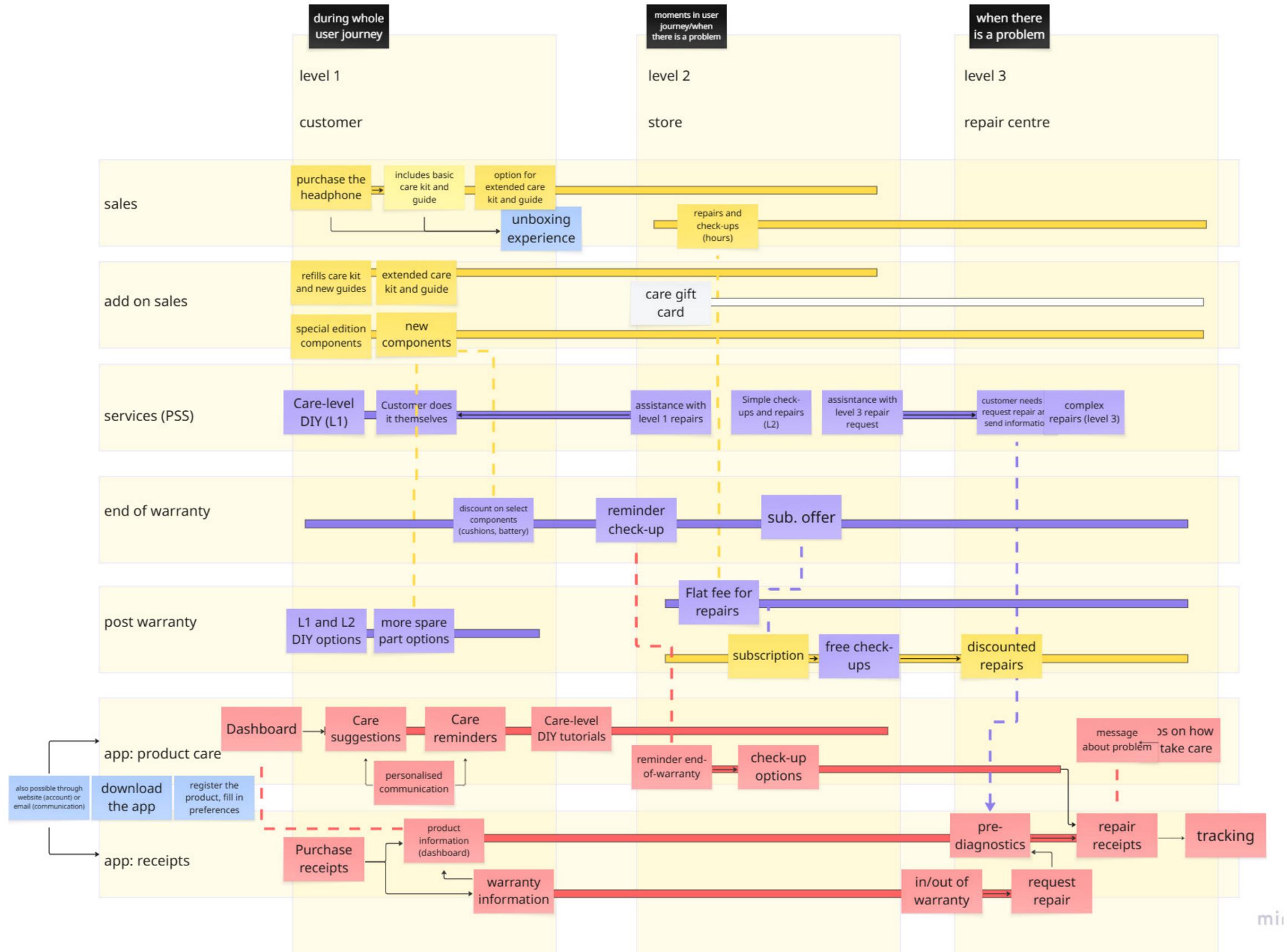


Repair message



Repair tips

16. CONCEPT STRUCTURE



17. IMPLEMENTATION PLANNING

		Horizon 1 2025-2026	Horizon 2 2026-2031	Horizon 3 2031-2035
		Stabalizing existing services	Intoducing framework	Connecting: one ecosystem
Proactive care and repair	Sales	Purchase the headphone	Includes basic care kit and guide	
	Add on sales	New components		New components Special editions
				Refills basic care kit and guide
	Account: product care	B&O app: register product		Extended care kit and guide
				App: Dashboard Care reminders Care sugestions Care-level DIY tutorials
	Account: receipts			Email: Care sugestions
		Reminder end-of-warranty		
Communication	Email with receipt		Check-up and repair options	
	Store Email Website		App: Purchasing receipts Warranty info	
		Repair options	App: Repair receipts Requesting repair Pre-diagnostics Tracking Feedback	
			Store Email Website App	
			All repair options and levels explained	
Personalized services (levels)	Level 1	Change basic components	Minimal care-level DIY	Full care-level DIY
	Level 2	Small repairs	Small repairs and check-ups	
		Assistance with level 1 repairs Assistance sending to repair centre		
	Level 3	Complex repairs	Complex repairs and check-ups	
Request repair		Short prediagnostics form	Pre-diagnostics through app	
Post-warranty support	End of warranty	Reminder end-of-warranty check-up		
		Discount on select components		
	Level 1	Change basic components	L1 and 2 DIY options	
		More spare part options		
Level 2 and 3	Repairs			
			More spare part options	
			Subscription (extended warrnty)	

