NPD4CE
2023

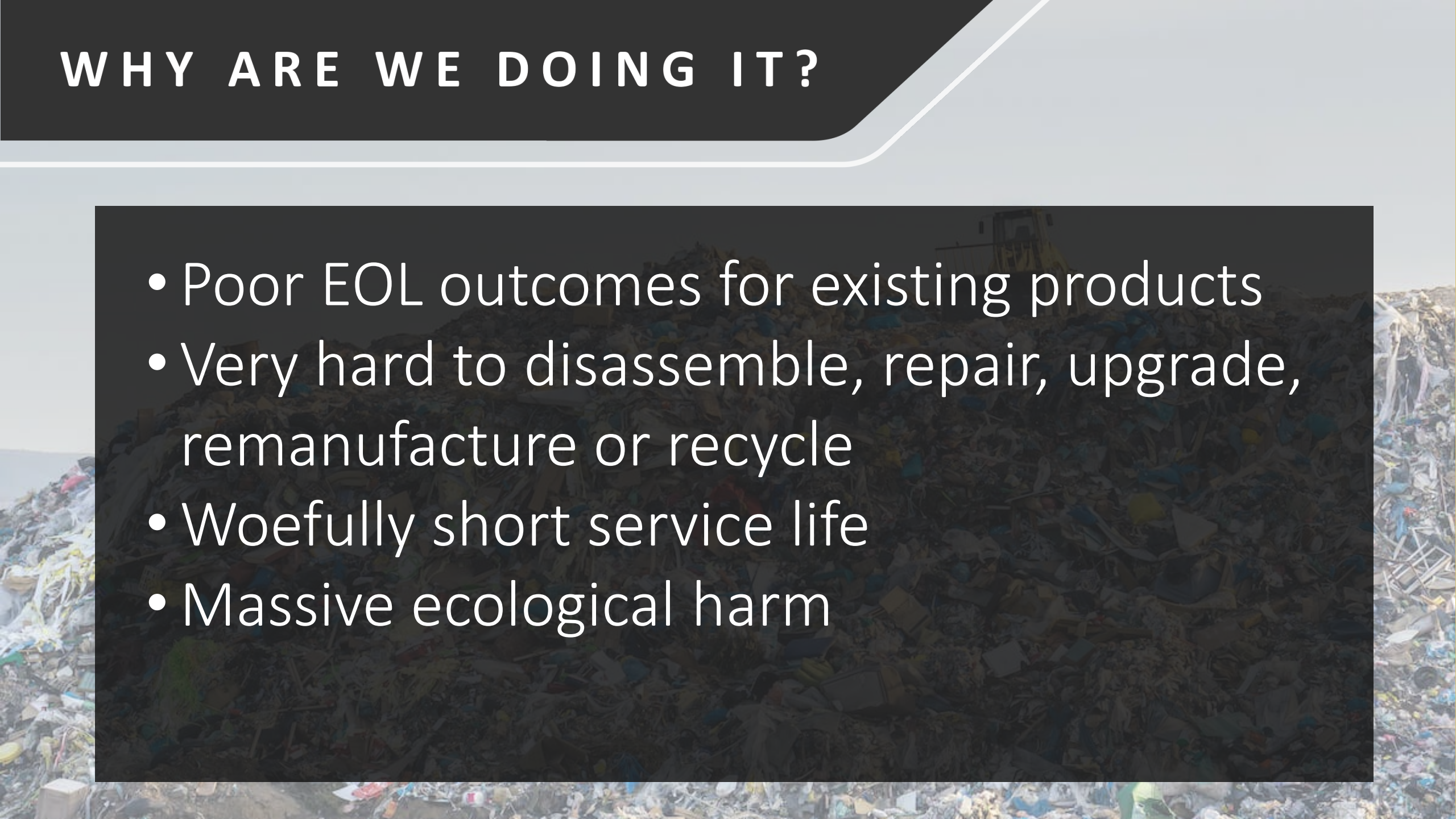
New Product Development for Upcycling + Circular Economy

BOOKSHELF SPEAKER

WHAT ARE WE DOING?

- Redesigning electronic products with an aim to find innovations in product development for both upcycling and the circular economy
- Speaker

WHY ARE WE DOING IT?



- Poor EOL outcomes for existing products
- Very hard to disassemble, repair, upgrade, remanufacture or recycle
- Woefully short service life
- Massive ecological harm

HOW?

First Step - Research

- Desk research
- Reverse Engineering of an existing product
- Expert Interviews

FINDINGS – DESK RESEARCH

- Circular business models
- Product lifecycle categories
- Product attachment and emotionally durable design

CIRCULAR BUSINESS MODELS

5 Discrete Business Models:

- Classic Long-life: Products are built to last and sold at a premium
- Hybrid Model: Profits are driven by the repeat sale of consumables
- Gap Exploiter: Providing a service to fill a gap in the market (e.g: repair and maintenance)
- Access model: Provide access to the product
- Performance: Provide the service / utility

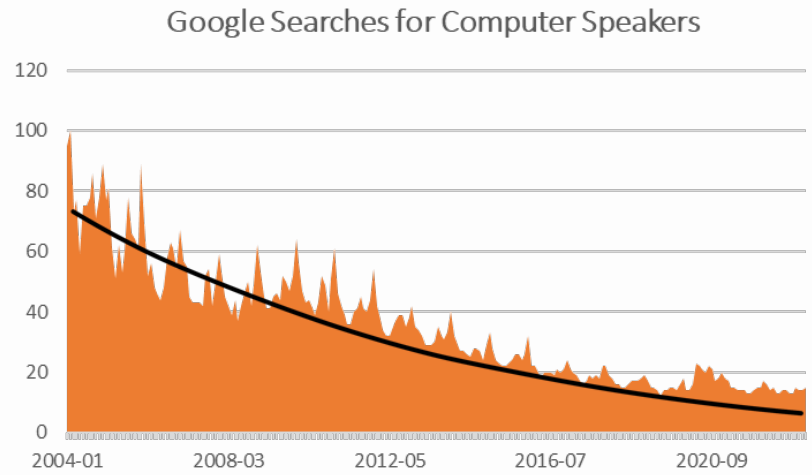
PRODUCT LIFECYCLE CATEGORIES

How developed a product or technology is.

Four categories:

- Introduction
- Growth
- Maturity
- Decline

Which effect design priorities.

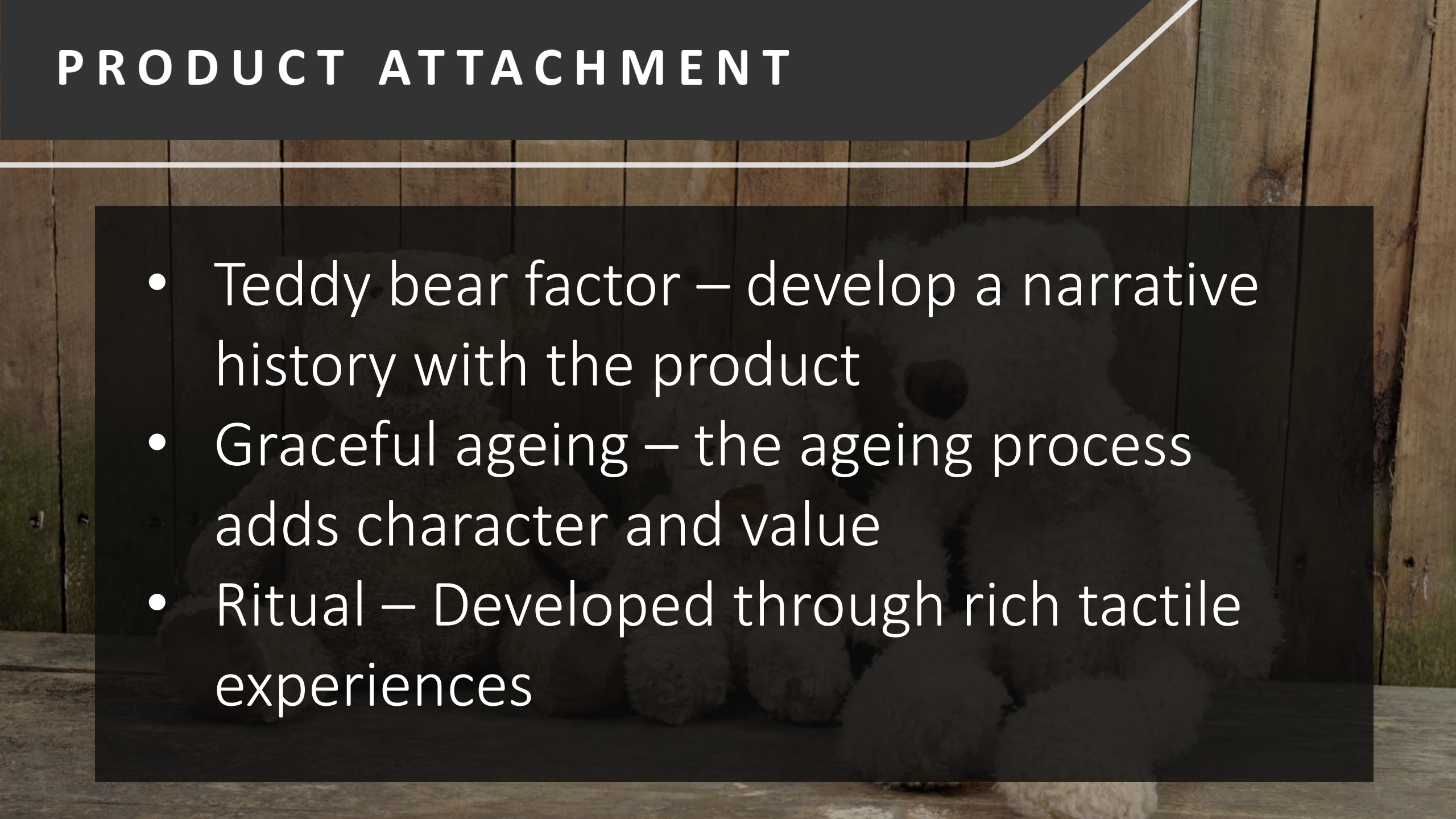


Computer Speakers are identified as being in the decline phase.

Therefore, the factors are a priority:

- Durability
- Standardisation and Compatibility
- Maintenance and Repair
- Dis- and reassembly

PRODUCT ATTACHMENT



- Teddy bear factor – develop a narrative history with the product
- Graceful ageing – the ageing process adds character and value
- Ritual – Developed through rich tactile experiences

FINDINGS – EXISTING PRODUCT ANALYSIS

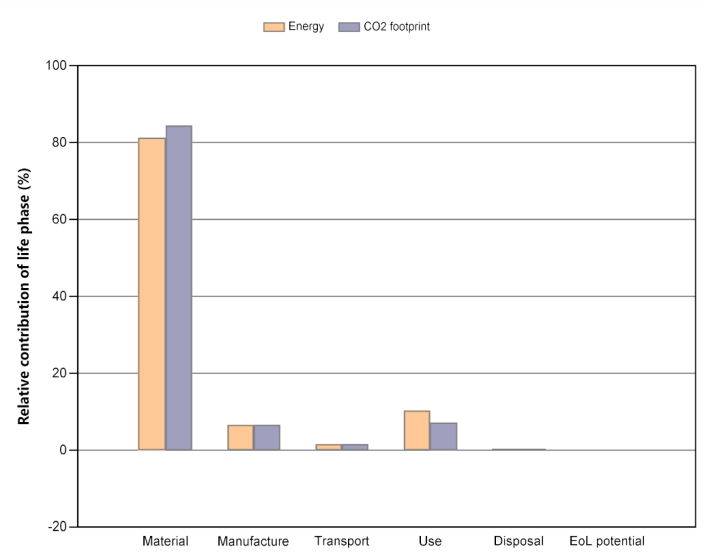
SONY SRS-XB23
Portable Bluetooth Speaker

- Eco-audit
- Reverse Engineering

ECO-AUDIT

Assumptions:

- Transport from Shenzen – Felixstowe via Ocean Freight
- 1 hour of Daily use
- Service life of 5 years



High Embodied Energy (84.5%) of CO2 Emissions

Incredibly power efficient
>1 Watt in operation

REVERSE ENGINEERING

Very hard to disassemble

- Small and Easily Stripped Screws
- Snap-hooks and one-way fasteners
- Over-reliance on SMD components

FINDINGS – STAKEHOLDER INTERVIEWS

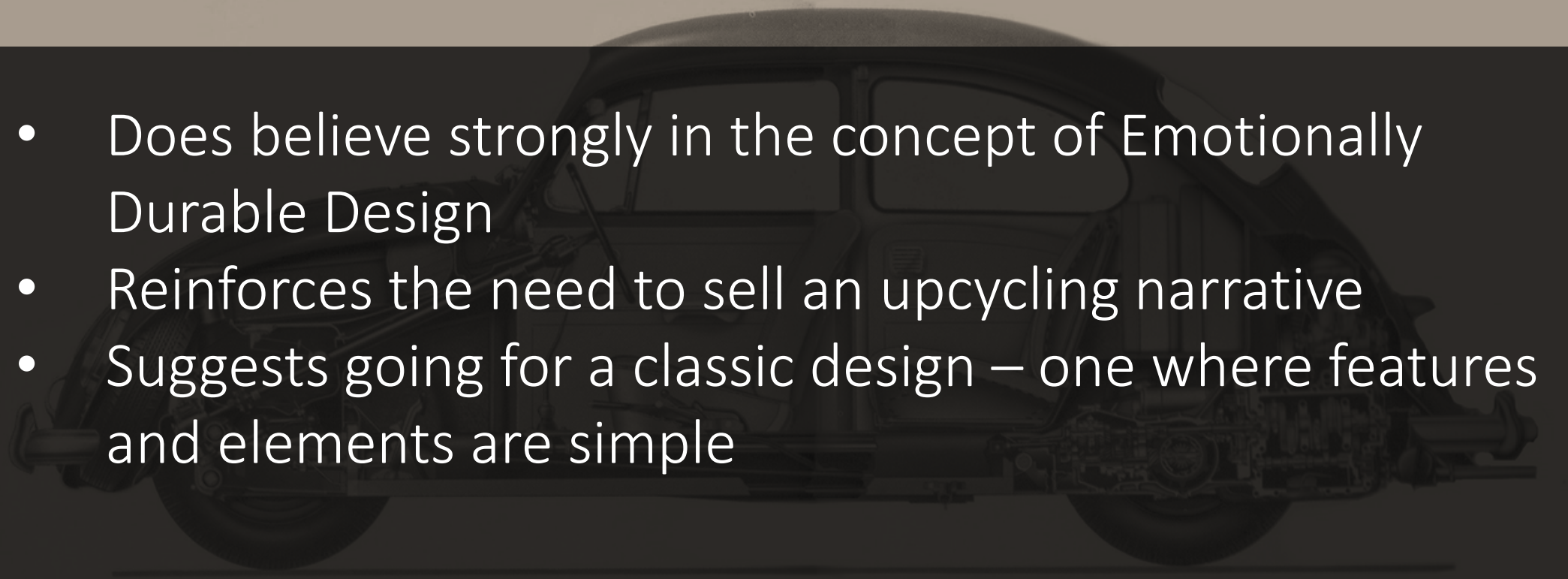
Three Interviews

- Nick Rowan – Senior Product Design Lecturer
- Abby Hatch – Sustainable Design Engineer
- Seb Ward – Design Engineer at MIXX

NICK ROWAN

- Don’t go for the Audiophile market, upcycled designs are inherently compromised
- Sell the narrative
- Disagreed with the theory of Emotionally Durable Design
- 2 Classes of Products
  - Perpetual
  - Disposable

ABBY HATCH



- Does believe strongly in the concept of Emotionally Durable Design
- Reinforces the need to sell an upcycling narrative
- Suggests going for a classic design – one where features and elements are simple

SEB WARD

- Antiques as a source of Inspiration – Needs to be desirable
- 3D Printing as an excellent technology to utilise
- Ease of use

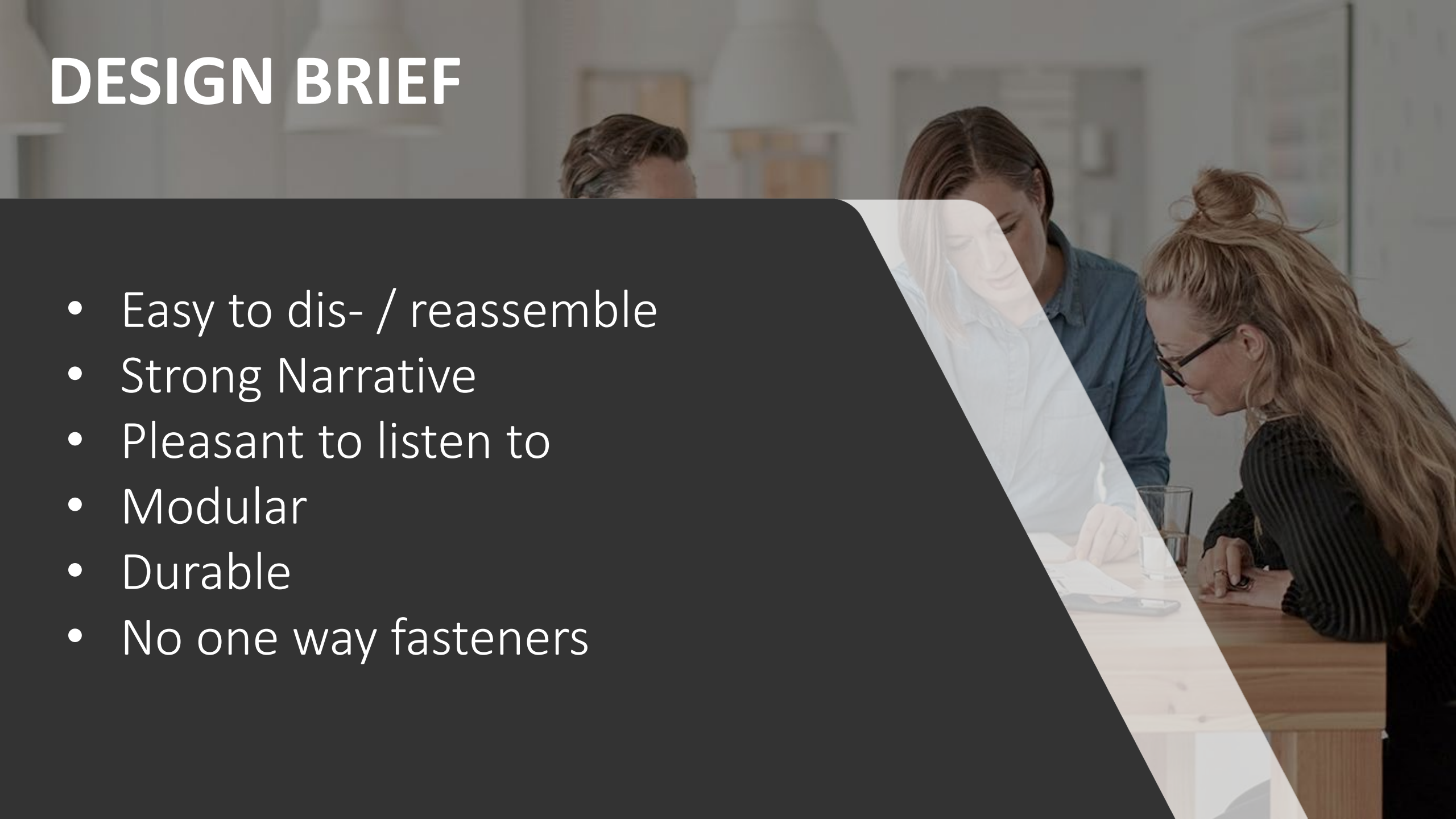
KEY CHALLENGES

Making upcycled products desirable – Narrative

Prolonging Service life – Emotionally Durable design / Maintenance and Repair

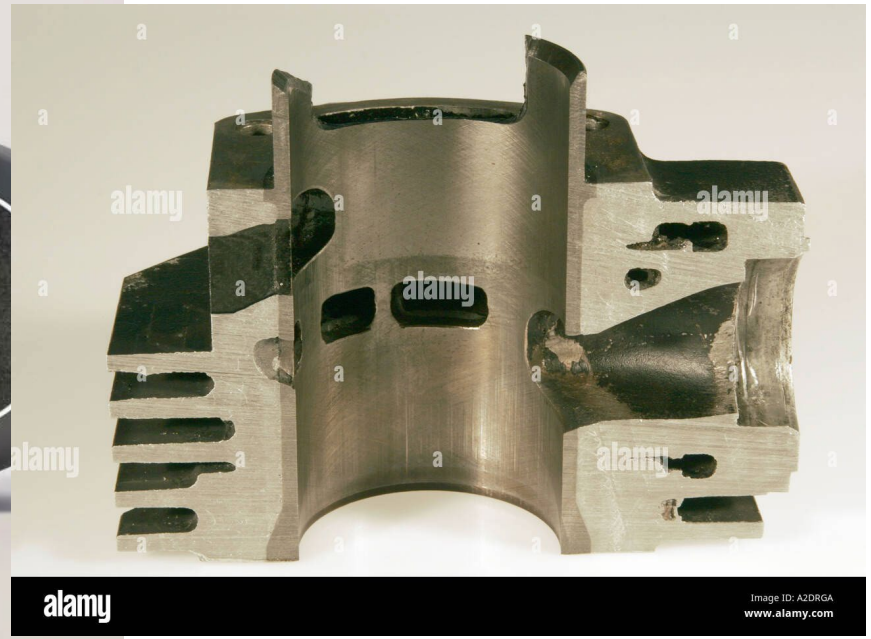
Improving EOL outcomes – Dis- and reassembly

DESIGN BRIEF



- Easy to dis- / reassemble
- Strong Narrative
- Pleasant to listen to
- Modular
- Durable
- No one way fasteners


dyson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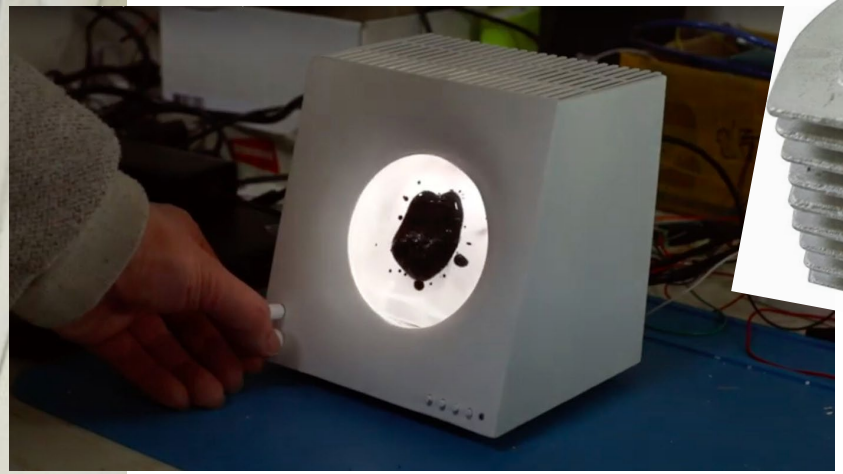
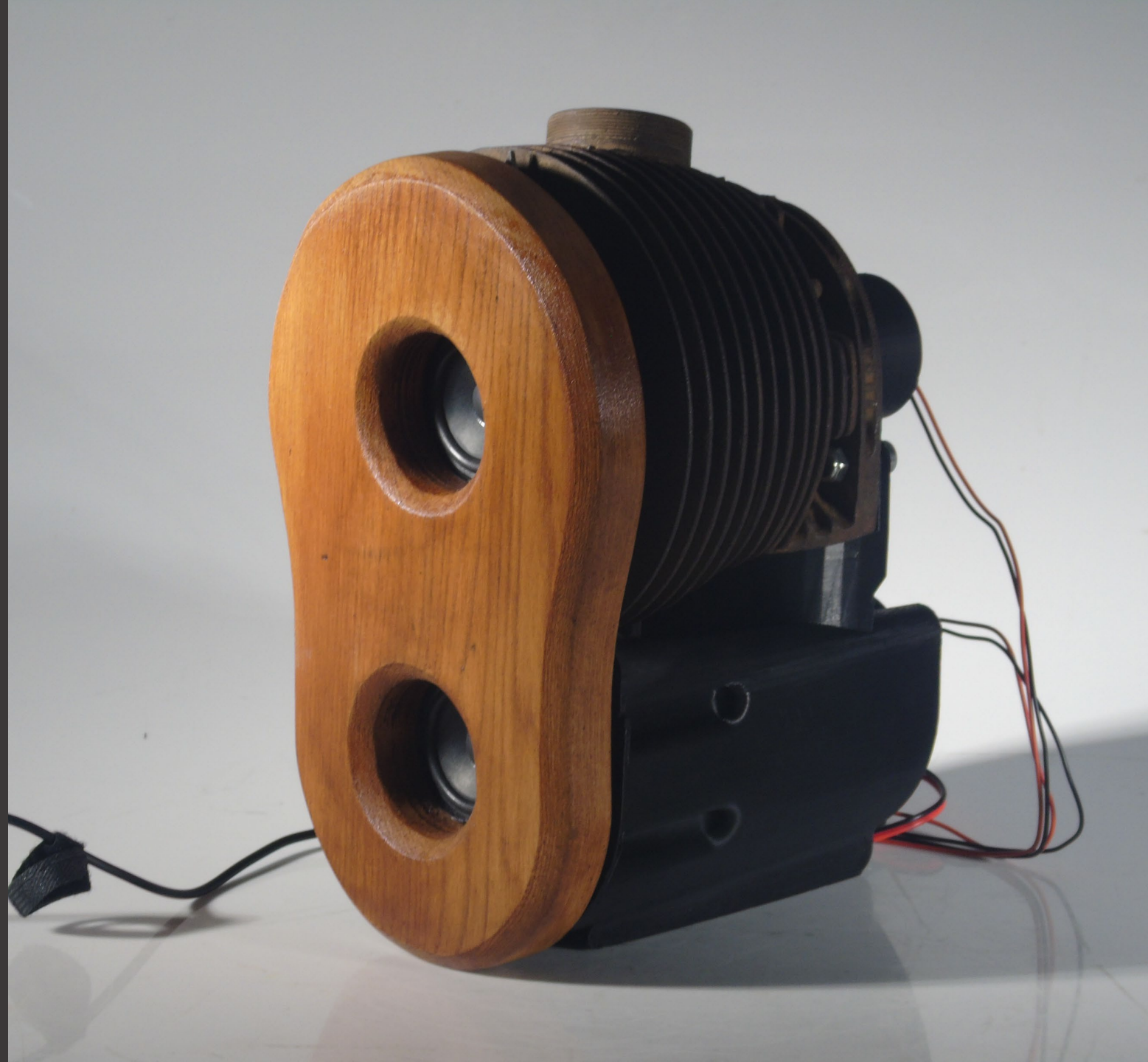



SHOP
ZH

2-Stroke Barrel Concept

- Ferrofluid Display
- 2 Stroke Barrel
- Narrative of Reusing fluids

- Villiers 2-Stroke Barrel
- Base printed from rPLA
- No adhesives / one-way fasteners



CONCLUSION

- Entirely possible to make a working product from reused / remanufactured parts with few compromises
- A strong narrative is vital to make upcycled products appealing
- More research needs to be done on upcycling/remanufacturing at a commercial scale

GUIDELINES

- Focus on narrative
- Stick to industry standards and conventions, especially for input/output, controls and user-interaction
- Design for long service life with repair and maintenance in mind
- Environment as a user