How can servitization drive circular product design?
SLOW DOWN AND CLOSE THE FLOW OF RESOURCES
Circular business models open up the value chain for new collaborations and services enabling bottom line impact

Circular sub-models

As a Service models are mostly concerned with the operation phase, but span across the value chain

Source: Accenture
PSS models (based on A. Tukker, 2004)
1. **Product oriented**: revenue from sales of (high quality) products

Statistically, people change their partner before they change their Miele washing machine.

Today the average marriage lasts 10 years. A Miele washing machine is "built to last 20. It's cherish your clothes till death do you part. Faithful to the end, it's quiet, it's energy efficient and it's unbreakable. So, should you tie the knot, make sure you have a pre-capital agreement as to who gets the washing machine. Brochure line 0845 330 3660. www.miele.co.uk
2. **Use oriented (‘access’): revenue from payments for product access**

Pay per wash
2. **Use oriented (‘access’): revenue from payments for product access**

Pay per wash
3. **Result oriented**: payment for service delivered (‘performance model’)
Pay for clean clothes

Dry cleaner
How can servitization drive circular product design? (it depends on who does the designing and production)

Based on A. Tukker, 2004
Swapfiets – access to a bike for a fixed monthly fee & great service on location
Mobike: pay per use

E-mobike by Springtime
Riversimple: access to hydrogen powered car for fixed monthly fee

“We’ve created a simple pricing structure that enables customers to pay a single monthly fee that covers everything – the car, the maintenance, the insurance, the fuel.”
SIX DESIGN STRATEGIES

1 - Design for attachment and trust
2 - Design for durability
3 - Design for standardisation and compatibility
4 - Design for ease of maintenance and repair
5 - Design for upgradability and adaptability
6 - Design for dis- and reassembly
The Incredible Machine
Transparent charging station

"The right to know
who’s in charge"
TagItSmart.eu Smart Recycling

**02 IN-STORE**

Each receipt has a unique barcode and call-to-action to scan. Consumer uses Reciclaya app to scan and create a catalogue of all purchased items.

- **Point of Sale data sent to cloud via API**
- **Packaging information for each product**

**03 AT HOME**

Consumer gets information on how to recycle different parts of each product, according to the recycling scheme in the local area.

- **Consumer actions recorded in the cloud**
- **For example:** A pack of 6 beer bottles consists of a cardboard sleeve, glass bottle and metal cap
TagItSmart.eu  Smart Recycling

04 SMART BINS
Consumer scans smart bins once they have sorted and recycled the packaging.

App locates information about closest recycling points

05 REWARDS
Consumers are rewarded with special discounts for recycling. Consumer recycling data for valuable analytics and insights.

Real-time data to cloud
SUPPLY CHAIN TRANSPARENCY AND CRYPTOCURRENCY REWARDS WITH EVERY DRINK

Author Niall Murphy (CEO & Co-founder)
PUBLISHED JUN 14, 2018

Evrythng Blockchain

Transparency Trust
**Slock.it** 3D printing enabled by blockchain
Convenient and secure rental of machine time
TU Delft: 3D printing for value-added repair
TU Delft: 3D printing for value-added repair
3D printing self scan for repair – master thesis Thijs Beerkens

Don’t break up with your beloved.
3D printing with local, renewable materials
PhD Mariet Sauerwein
Product service system design

• Design becomes a much more continuous and complex process

• Challenges: ethics (“dark side of access”), systemic problems (“rebounds”)
Bugaboo lease & refurb pilot

Source: ResCoM (H2020)
Uncertified refurbishment / 2nd hand
Bugaboo lease & refurb pilot

- Leasing package for strollers
- Pilot with 50 customers over 3 years
- With ‘Bugaboo certified refurbished’ strollers

Source: ResCoM (H2020)
Bugaboo lease & refurb pilot

• Lease a stroller by paying a deposit (200 Euro) and a monthly fixed fee.

• Value proposition: customers could change their stroller according to their changing needs (get 2 for the price of 1).

Source: ResCoM (H2020)
Bugaboo: lessons learned

• Many challenges
  – Bugaboo not optimized for acting as a service provider
  – No experience with reverse logistics
  – New to refurbishment (f.i. regulatory compliance)
  – Customers treated leased strollers with less care
Bugaboo: lessons learned

- Pilot was extremely useful, but very much a first step
- Going circular = as complicated as setting up a new business
- Positive effect on product design (reparability, ‘products to last’)

3D printed swivel wheel lock – iFixit contest – winning TU Delft students entry
Servitization drives circular design

• Importance of a strong value proposition
• Design becomes a continuous process (it’s no longer just about the ‘shiny end product’ but about the entire service system)
• Sharing is caring?
MOOC Circular Economy via edX.org (free)