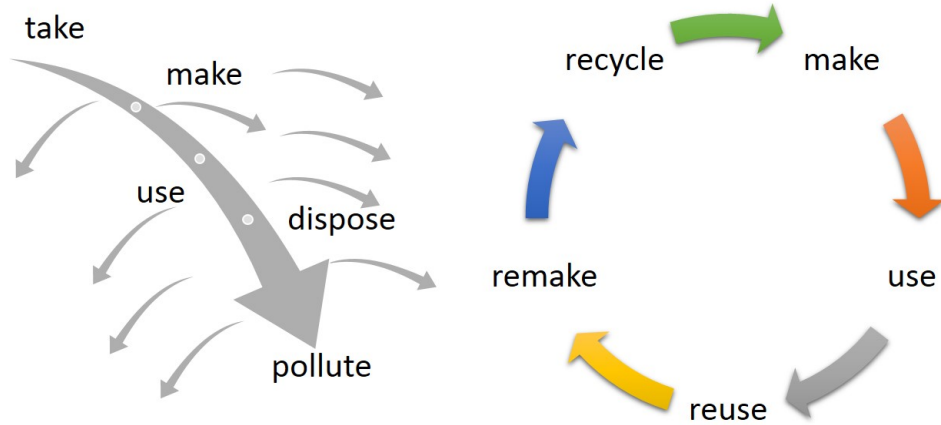
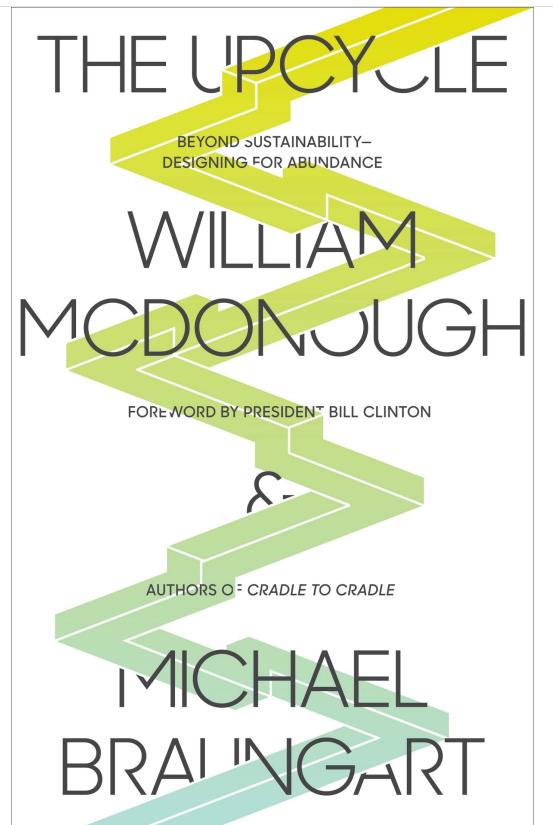
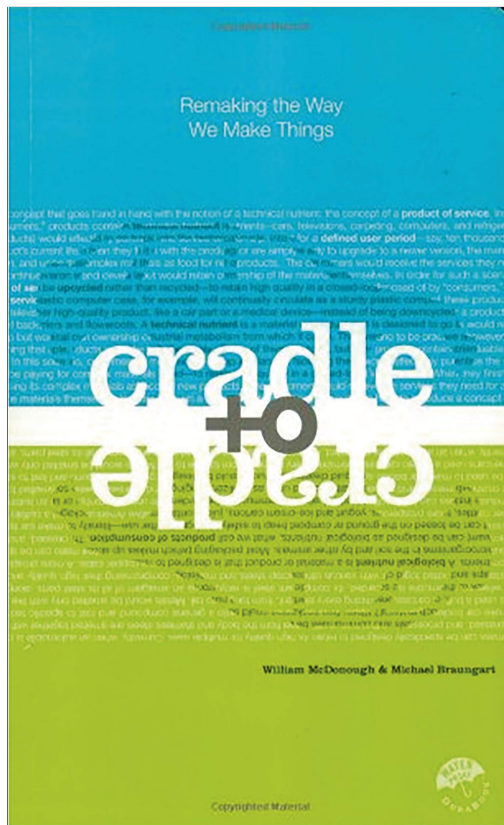


# Käyttäjälähtöisyys kiertotaloudessa



CC 3.0 Catherine Weetman 2016



**Probably the most comprehensive CE definition:**

**A circular economy describes an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production, distribution and consumption processes, thus operating at the micro, meso and macro levels, with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations.**

Smarter product use and manufacture	R0 Refuse	Make product redundant by abandoning its function or by offering the same function with a radically different product
	R1 Rethink	Make product use more intensive (f.e. by sharing product)
	R2 Reduce	Increase efficiency in product manufacture or use by consuming fewer natural resources and materials
Extend lifespan of product and its parts	R3 Reuse	Reuse by another consumer of discarded product which is still in good condition and fulfils its original function
	R4 Repair	Repair and maintenance of defective product so it can be used with its original function
	R5 Refurbish	Restore an old product and bring it up to date
	R6 Remanufacture	Use parts of discarded product in a new product with the same function
Useful application of materials	R7 Repurpose	Use discarded product or its parts in a new product with a different function
	R8 Recycle	Process materials to obtain the same (high grade) or lower (low grade) quality
	R9 Recover	Incineration of material with energy recovery

Adapted from Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy. An analysis of 114 definitions. *Resources, Conservation & Recycling*, 127, 221-232.

HELL  
IS  
OTHER  
PEOPLE

*Users*

- after JEAN-PAUL SARTRE



**Solution 1:**  
**LET'S REDUCE**  
**COMPLEXITY**

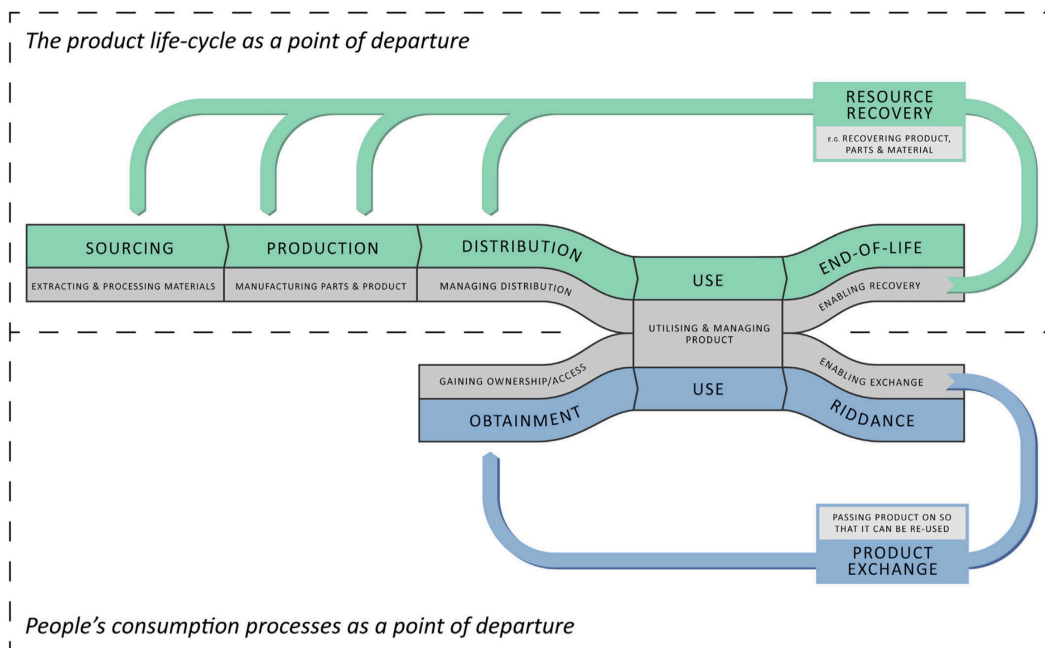




# Solution 2: LET'S PROLONG PRODUCT LIFE



# Solution 3: LET'S MAKE IT USER-CENTRED



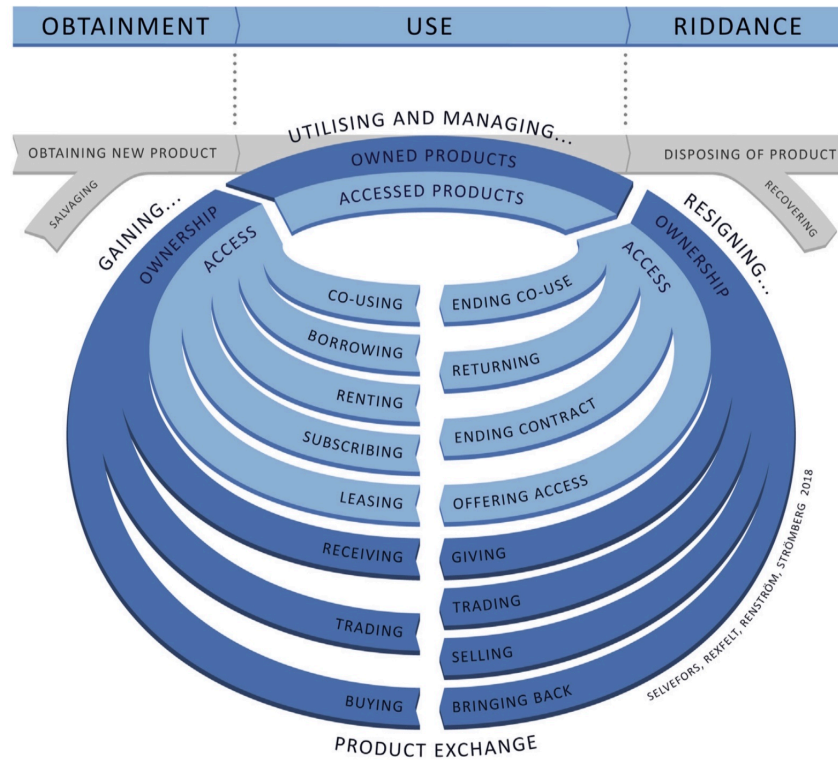
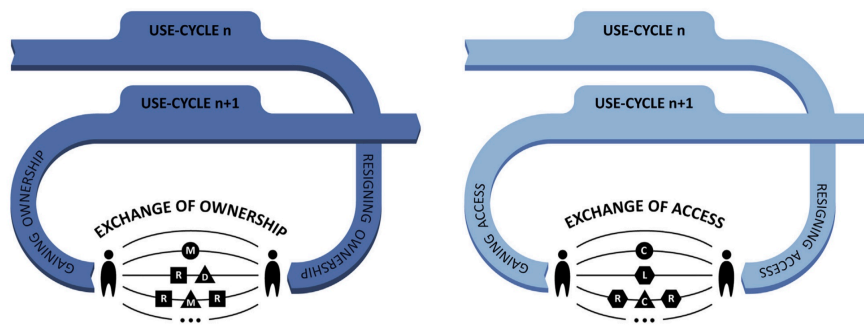


Fig. 3. The consumption cycle with examples of circular paths of consumption in relation to a linear consumption process.



Exchange of ownership or access between users can be enabled by:

- exchange agents who facilitate exchange without gaining ownership, such as: **C** connectors, **M** mediators
- exchange agents who gain ownership temporarily, such as: **R** retailers
- exchange agents who maintain ownership and offer access, such as: **R** renters, **L** lenders
- ▲ exchange agents who support other agents, such as: **C** cleaners, **M** menders, **D** deliverers
- ... other types of exchange agent(s)
- the users without involvement of any exchange agent

Fig. 5. Examples of how exchange agents can support the transfer of ownership or access between users.

# DESIGN FOR EXTENDED USE



## Ways to address challenges related to extended use:

### Address lowered product utility by...

- ▶ ensuring long-term technical utility and performance
- ▶ making it easy to maintain the product in good condition by proactively cleaning or changing parts that are most prone to wear and tear
- ▶ making it easy to replace parts that are intended to be consumed during long-term use but necessary for sustaining performance, and to realise when it is necessary
- ▶ making it easy to repair products and to replace broken parts



Fishing reels can be designed to last a life-time and to ensure long-term performance (Abu Garcia, 2018).



Chainsaws can be designed with snap-lock cylinder covers and quick-release air filters to facilitate cleaning and replacements of spark plugs and air filters (Husqvarna, 2018).



Ladders can be designed so that they can be maintained and repaired and so that broken parts can be replaced. Spare parts and instructions for maintenance and repair can also be provided (Wibe ladders, 2018).

### Address lowered product attractiveness by...

- ▶ ensuring long-term attractive appearance so that people will want to use the product to fulfil their needs
- ▶ making it easy to form long-term emotional bonds to the product if it can support people to fulfil their needs over long periods of time



Jeans can be designed so that they last long and age well despite wear. With time, they can even become so attractive that they can be re-sold as unique pieces and branded as pre-worn jeans (Nudie Jeans, 2018).



People can be invited to partake in the production of their new leather shoes to support the formation of emotional bonds and encourage long-term use and care (Skofabriken Kavát, 2018).

### Address lowered need fulfilment by...

- ▶ making it easy to upgrade the product so that it better supports people to fulfil their needs, and to adapt the product to new technologies so that it can continue to be used to fulfil needs even after technological shifts
- ▶ enabling people to utilise the product to fulfil needs that change with time



Light bulbs can be designed so that they enable people to change parts that include fast-changing technologies (The Agency of Design, 2018).



Children's clothes can be designed so that they can be extended one size by untacking a seam in the garments' sleeves or trouser legs (Didriksons, 2018).

Fig. 7. Examples of ways to enable extended product use and make this more appealing. Product and service examples provided by Abu Garcia (2018), Husqvarna (2018), Wibe ladders (2018), Nudie Jeans (2018), Skofabriken Kavát (2018), The Agency of Design (2018), and Didriksons (2018). Selvefors, A., Rexfelt, O., Renström, S., & Strömberg, H. (2019). Use to use. A user perspective on product circularity. *Journal of Cleaner Production*, 223, 1014-1028.



# DESIGN FOR PRE- AND POST- USE



## Ways to address practicalities related to pre- and post-use:

### Support people to handle (pre-used) products by...

- ▶ *making it easy to clean the product prior to and/or after use*
- ▶ *making it easy to (re-)install and uninstall the product*
- ▶ *making it easy to access and pass on product specific information*



To facilitate re-use of suitcases, hard case suitcases can be designed with fabric lining that can be removed and cleaned (Evertsson & Johansson, 2017).



To facilitate movie rentals in the 80-ties, Movieboxes were designed to give people temporary access to VHS players. The movieboxes were designed with installation instructions and product details printed on top to facilitate installation and use (Tekniska museet, 2017).

### Support people to realise when products should be passed on by...

- ▶ *discouraging people to store the product (and any of its accessories) if it does not fulfil their needs in order to avoid hibernation*
- ▶ *encouraging people to reflect on whether or not the product is needed and/or when it can support someone else to fulfil their needs*
- ▶ *discouraging people from forming long-term emotional bonds to the product if it only supports them to fulfil their needs for short periods of time, and/or making it easy for people to let go of the product despite emotional bonds if the product no longer supports them to fulfil their needs*



To encourage sharing of toasters, toasters can be designed to complain on twitter when not used enough and eventually demand relocation to a new host (Rebaudengo, Aprile, and Hekkert, 2012).



To encourage reuse of children's wear, clothes can be designed with multiple name tags that highlight that the garment can and should be used by several children.



To encourage subscriptions of baby clothes, subscription services can be designed to make users form emotional bonds to the service and the user community (not to each piece of clothing) through the use of social media hashtags (Vigga, 2018).

Fig. 8. Examples of ways to facilitate the pre- and post-use sub-phases. Product and service examples provided by Evertsson & Johansson (2017), Tekniska museet (2017), Rebaudengo, Aprile & Hekkert (2012), and Vigga (2018).

# DESIGN FOR EXCHANGE

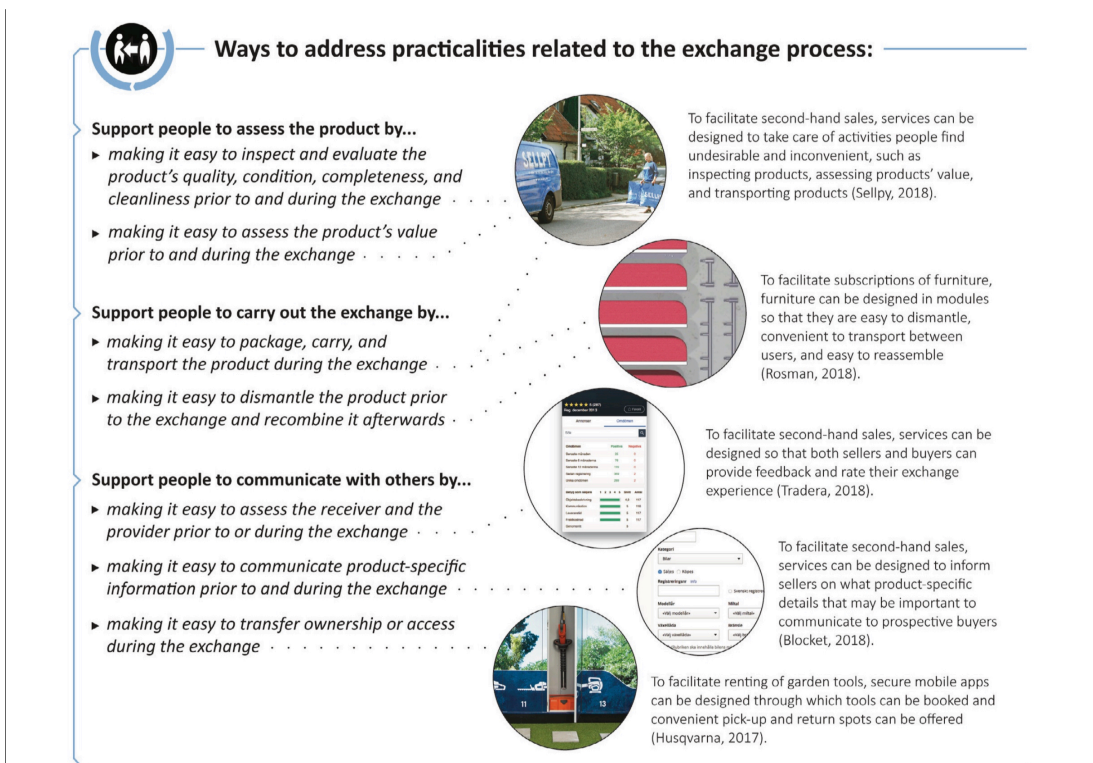


Fig. 9. Examples of ways to facilitate the exchange process. Product and service examples provided by Sellpy (2018), Rosman (2018), Tradera (2018), Blocket (2018), and Husqvarna (2018).

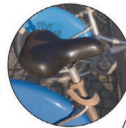
# DESIGN FOR MULTIPLE USE- CYCLES



## Ways to address challenges related to multiple use-cycles:

### Address diverse user needs by...

- ▶ enabling different users to utilise the product to fulfil similar needs
- ▶ making it easy to modify the product so that it can be used by different users to fulfil different needs



Rental bikes can be designed with a simple lever that makes it easy and convenient for each user to adapt the seat height to his/her needs (JCDecaux, 2018).



Sofas for subscription can be designed in modules so that they are adjustable to different needs (Rosman, 2018).

### Address shortened use-cycles by...

- ▶ making it easy to understand how to use the product without previous experience
- ▶ making it easy to learn how to use the product without extensive practice



Rental tents can be designed using colour coding and clear instructions can be provided to make it easier for users to set the tent without previous experience (Hagman & Wendt, 2018).



Baby clothes can be offered through a subscription service that cleans all clothes centrally in-between use-cycles to remove bacteria, microorganisms, and smells (Vigga, 2018).

### Address the history of past users by...

- ▶ making it possible to erase undesirable traces of use
- ▶ enabling people to experience traces from previous users and contribute new desirable traces that add value through each use-cycle
- ▶ communicating the product's increased value or associated benefits



Devices and instructions can be designed to support removal of personal data and make it easier for people to circulate their devices to new users (Apple, 2018).



Toasters can be designed with a counter that clicks round for each slice of toast so that future users will know how many rounds of toast have been enjoyed (The Agency of Design, 2018).



Rental services can communicate the environmental benefits of renting e.g. a tent with a CO2/night score that decreases each time a tent is rented (Hagman & Wendt, 2018).

Fig. 10. Examples of ways to enable multiple use-cycles and make it more appealing to circulate products. Product and service examples provided by JCDecaux (2018), Rosman (2018), Hagman & Wendt (2018), Vigga (2018), Apple (2018), and The Agency of Design (2018).



Bonus

# DESIGN FOR DETACHMENT



Photo: Aalto EE