

## How to Stimulate People to Take Care of Products? – The Development of a Toolkit for Designers

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**Keywords:** product longevity; consumer behaviour; behaviour change; design toolkit.

**Abstract:** Taking care of products is an important aspect of sustainable consumer behaviour, because it is an appropriate approach to prolong products' lifetimes. Although consumers in general agree on this and demonstrate a general motivation to take care of their products, previous research has shown that they struggle to repair, maintain or treat their products carefully in daily life. Design has the potential to increase consumers' product care activities, but more knowledge and distinct strategies are needed by designers to purposefully design for this behaviour. We used three different approaches – a workshop with design students, an analysis of already existing products and services that have implemented aspects of product care, and an ideation session – to create eight strategies and 24 sub-strategies that can stimulate product care through design. These eight strategies are *informing, enabling, social connections, appropriation, control, awareness, antecedents & consequences, and reflecting*. To support designers in the implementation of these strategies, we transferred these strategies into a toolkit, which can be used in the product development process of different kinds of products. This paper describes the development of the product care strategies as well as the Product Care Toolkit.

### Introduction

Keeping products in use for a longer period of time is an important step towards the Circular Economy (Ellen MacArthur Foundation, 2013). One possibility to extend products' lifetimes is to take care of them. Product care is defined as any practice performed by consumers that prolongs a product's lifetime, such as repair activities, maintenance, adaptation of an existing product according to consumers' needs (such as modifying the size of clothing) and executing measures that aim to prevent product damage (Ackermann, Mugge, & Schoormans, 2018). Product care can be conducted by both the consumer or a service provided. Nevertheless, in both cases, product care is initiated by the consumer, so he/she plays a crucial role. Research has shown that consumers do not lack the general motivation to take care of their everyday products, but still struggle to do so (Ackermann, 2018). More knowledge is needed on how design can contribute to the desired change in product care behaviour. This paper addresses this gap by (1) developing and researching a wide array of design concepts and ideas that in some way

stimulate product care, (2) categorising them into different product care design strategies, and (3) translating this knowledge into a toolkit that supports designers who wish to implement product care into their service and product design.

### The Need to Stimulate Product Care

Several design approaches, such as van Nes and Cramer's (2005) Design for Repair & Maintenance principle or the Design for Ease of Repair and Maintenance principle (Bakker, den Hollander, van Hinte, & Zijlstra, 2014) propose to facilitate product care through the implementation of specific design solutions, such as the use of standard tools or the avoidance of glued joints. Although these approaches are an important angle to design for product care, they only focus on the product itself while disregarding the crucial aspect of consumer's motivation and behaviour. The latter will, however, in the end determine whether according action is taken or not, that is if the consumer takes care of his/her product in daily life.

Prior research on product care (Ackermann et al., 2018) used the behaviour model by Fogg (2009) to describe the necessary means to increase product care among consumers. Based on this model, people need motivation for behaviour to occur, but also need to feel capable to carry out these activities. Finally, triggers – small events or signals that enhance the motivation or ability at a certain point of time – are important for people to initiate activities. In general, people are motivated to take care of their products, but still struggle to integrate these activities into their daily lives (Ackermann, 2018). In order to tackle this issue and to address product care to its full potential, we believe that product care behaviours should already be considered when a product is still in the design phase. Thus, the aim of this study was to explore how product care can be stimulated via design, while by focusing on the consumers' perspective. For the practical application of designing for product care, we aim to teach designers about product care and provide them with strategies to stimulate product care through the design of the product or related services.

## Method

We aimed at first developing design strategies for product care, which could then be translated into a toolkit. To identify different ways to enhance product care, three different sources of inspiration were used to ensure a broad range of ideas and concepts. The first one was a workshop with four design students and one design professional. As the strategies were meant to support designers, we found it important to include them in our process. Some days prior to the workshop, we sent an overview of seven types of product care to the students. This list was based on prior research (Ackermann et al., 2018) and included the following activities: repair, preventive measures, product revival, creating something new/different, instructed handling, mindful handling, and routine acts. With this knowledge, the students were asked to think about two products: One product that they take care of, and another product that they do not take care of. During the session that lasted around 2.5 hours, the participants presented their two products to start the discussion about product care. Three different rounds of ideation followed: In a first ideation round, they created ideas for each type of product care. In the second round, ideas to stimulate care for the products they brought with them as not being

cared for, were developed. In the last round, ideas for a range of six different product categories (based on Ackermann et al., 2018), such as household appliances, consumer electronics, and furniture were collected. The workshop was wrapped up with a preliminary clustering of the 140 ideas.

Secondly, an extensive research of already existing products, services and concepts that support product care was conducted via the internet, by asking friends and colleagues and based on prior experiences. By doing so, we also gained insights from solutions that had been on the market for several years. This research led to the collection of 76 care solutions. Thirdly, an individual ideation session was conducted by one member of the research team, based on her knowledge about product care and about already existing concepts. She aimed to find ideas for the six different product categories, for the seven types of product care and for the five senses (sight, touch, hearing, smell and taste). Her ideation session resulted in another 63 ideas to stimulate product care.

This phase ended with 279 new ideas and already existing solutions to stimulate product care through design. As this number is too large for successful implementation in a design tool, it was decided to translate the solutions to more general, superordinate design directions that can be used by designers. To identify these design directions, the ideas and concepts were first clustered individually by two researchers based on correspondence between the different solutions in the way product care behaviour was encouraged. Afterwards, these researchers discussed their clusters with each other and reached consensus on the final 8 strategies and 24 sub-strategies.

## Results: Design Strategies for Product Care

Eight strategies with 24 sub-strategies were identified as possible ways to stimulate product care (see Table 1).

strategy	sub-strategies
<b>informing</b>	static info
	interactive info
	physical information
<b>enabling</b>	providing flexibility
	providing necessary means
	providing a service
<b>social connections</b>	social connections as a result of product care

	social connections as facilitators for product care
	shared ownership
<b>appropriation</b>	personalization
	ever-changeable products
	creative change
<b>control</b>	product takes initiative
	product handles product care itself
	unconscious takeover
	forcing product care
<b>awareness</b>	push messages
	product changes in appearance
	product changes in functionality or performance
<b>antecedents &amp; consequences</b>	anticipating effects
	after-effects
<b>reflecting</b>	meaningful memories
	showing traces
	experience of the product care activity

**Table 1: Strategies and sub-strategies**

*Informing* is related to different kinds of information. Besides already well-known means, such as written manuals and instructions, this strategy can also be implemented through interactive means, such as online tutorials, workshops for consumers etc., that can be offered as a service by the producer. The overall aim of this strategy is to heighten consumers' knowledge on product care to facilitate the care activities.

*Enabling* facilitates product care activities in a more practical way by offering the right tools together with the product at purchase. Another part of this strategy is to enhance the flexibility for repair and maintenance by designing the product in a way that standard tools can be used. The establishment of a network of service providers is also a way to enable product care.

*Social connections* describes the facilitation of product care through social connections. Specific communities can support consumers in their care activities, such as repair cafés or shared private garages to work on cars. Social connections can also be seen as the result of product care activities when interactions are created through product care. Shared ownership, which means that a product is used by several consumers, is also part of this strategy, because the users can feel obligated

to take care of the product so that they do not experience social rejection.

*Appropriation* describes the adaptation and/or personalization of a product according to the consumer's needs. This can be achieved by modular, ever-changeable products that allow the replacement of certain parts when an upgrade is desired. Appropriation also describes a product design that encourages the consumer to change the product in a creative way, such as upcycling and do-it-yourself activities. As a consequence of these creative activities, the consumer will feel more attached to this product and thus will take care of it.

*Control* can also stimulate product care and can be applied with different intensities: This strategy ranges from products that start the initiative for product care themselves. Some examples are a product that automatically opens when it needs cleaning or a product that refuses to work if it is not being cared of. In other cases, the product encourages the consumer to take care of it regularly, so it can be seen as an unconscious take-over of control, as product care becomes a habit. Another possibility is the use of materials that to a certain degree take care of themselves, such as self-healing materials.

*Awareness* is especially relevant for products that consumers often forget to take care of. Simple reminders, such as an alarm on the smartphone or an e-mail by the service provider, can make the consumer aware of the need to take care of his/her product. Furthermore, the product's appearance might change, such as a surface that looks unappealing when it is not being cared for. Also, a decrease in the product's functionality can raise the awareness.

*Antecedents and consequences* of product care – but also of non-care – can be communicated to the consumer. For example, the advantages of a well-maintained bicycle, such as less effort while cycling, can motivate the consumer to conduct these care activities. When a product is especially shiny or well working after product care, it might also motivate the consumer for future care activities.

*Reflecting* refers to meaningful memories and traces that are created through the interaction with the product in general and lead to a higher motivation to take care of it. An example might

be a skateboard with scratches, which can be seen as traces of usage. This valuable memory can also be created through the care activity itself. For example, painting a wooden piece of furniture can generate a unique value for the consumer, because he/she remembers that activity in a positive way. Another corresponding aspect of reflecting is the gamification approach: It connects the care activity with fun and pride, which can stimulate product care activities in the future.

### The Product Care Kit

These results were then transferred to the Product Care Kit (Figure 1). The aim of this toolkit is to teach designers about product care and provide inspiration on how to design for it. The toolkit is designed as a card-set and helps designers to understand the many aspects that can be relevant when designing for product care. Therefore, it consists of cards describing the seven different types of product care activities and eight cards which explain the different design strategies and their sub-strategies. For easy recognition, there is also a cartoon figure on each of the cards. The process of working with the Product Care Kit is flexible, so there are no strict rules or processes to be followed and not all cards have to be used each time. Instead, the cards are meant as triggers for providing inspiration, starting discussions and trying out different angles for the design solution. To facilitate that process, the toolkit also provides persona cards and product cards which can help to implement product care based on a specific scenario. In addition, cards with already existing examples of products that implement product care strategies are provided. The cards are magnetic, which makes it possible to use them on whiteboards and easily hold brainstorm sessions around them. They present questions which trigger the designer to think about how to target product care with their design. The outcomes of sessions with the Product Care Kit can range from conceptual product ideas or a visual map of the context to deepen discussions and generate new insights and knowledge about product care.



Fig.1: The Product Care Kit

### Discussion

The workshop, the research and the ideation session enabled us to develop eight design strategies with 24 sub-strategies to stimulate product care. One aspect that was discussed during the clustering session was that product care should be considered continuously during the design process, because it is a relevant issue to consider in different design phases, such as the choice of materials, service design etc. A general awareness about the relevance of product care is needed to bring product care into design processes. This awareness could be created by implementing product care knowledge into design education, or by training designers through workshops.

The comparison of our design strategies with already existing models and tools provides some theoretical background for our results. Specifically, it is relevant to compare our results to Fogg's model for behaviour change, which describes the importance of ability, motivation and triggers. Ability can be found in the *enabling* as well as in the *informing* strategy, both facilitating product care for the consumer. Young (2017) showed that the missing knowledge and equipment needed for product care are the strongest barriers to maintenance activities, so there is a huge potential concerning this issue. Also, *social connections* as a facilitator for product care is related to this aspect. These strategies can also be linked to Design for Ease and Repair (Bakker et al., 2014). Motivation, but also triggers, is covered by the design strategy *antecedents and consequences*, because positive and negative expectations about the outcome of taking care or not taking care of products can stimulate consumers. Further aspects that increase motivation are *appropriation* and *reflecting*, because they create a connection between

consumer and product that can stimulate product care (see also Mugge et al., 2005; Scott & Weaver, 2014). People's need to feel socially integrated, which is an intrinsic source of motivation, can explain the strategy *social connections* as a result of product care. *Control* and *awareness* are – depending on their sub-strategies – either sources of motivation or triggers that enhance the motivation at a certain point of time and thus lead to an immediate reaction by the consumer. Concluding, all design strategies seem to break Fogg's general model of behaviour change down to more manageable and concrete approaches to stimulate product care. These strategies support designers to use the insights into product care during their product development processes.

In contrast to already existing approaches to support repair and maintenance, our strategies take the consumers' perspective into account by stimulating their motivation and perceived ability. However, we do not yet know how consumers will respond to these strategies and if they would accept products and services with these strategies implemented. Consequently, in future research, we will interview consumers to uncover how they evaluate these strategies to understand under which conditions the implementation of these strategies would be accepted. Future research should also explore if the implementation of these strategies will increase product care in consumers' daily lives in the long-term. So far, the toolkit itself has been part of a small pilot study with design students, who judged it as easy to understand and work with. In addition, the toolkit will be tested in depth with designers and design students, during a workshop at the PLATE conference 2019.

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