Understanding Everyday Design

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Abstract
The more society gets complicated and developed, the more demand for various products. As a result, we are living in a flood of various products. However, considering how people consume and use products in their daily life, it is not difficult to find people transforming, changing the original purpose or adding value to existing products instead of buying new ones. This phenomenon has been defined as everyday design. In a sense that everyday design provides a better understanding of actual uses in real context, it deserves to be studied. Therefore, this paper attempts to figure out an underlying mechanism of everyday design. For this, a conceptual framework was developed, whose focus was on what triggers everyday design, what goals are set, and how a product is transformed. The conceptual framework was validated with a photographic inventory of users' everyday design in our daily life. The conceptual framework could provide a better understanding of everyday design in a systematic way. If it is considered in the product development process, it could contribute to an increase of use satisfaction as well as sustainable design. The limitations and a further study are discussed at the end of the paper.

Keywords: everyday design, unselfconscious design, hacking, product design, sustainable design

As a society gets more developed, product demand for proper purposes also increases and various products appear in the market to satisfy the demand of consumers. As a result, we are living in a flood of various products these days. It is no exaggeration anymore to say that we are buried under all kinds of products. Interestingly, this phenomenon appears more in developed countries than in developing countries: i.e. there are more diverse products designed particularly for a function in developed countries than in developing countries. For instance, there are a variety of kitchen appliances ranging from electric whisk and potato masher to vegetable peeler and silicon spatulas in Western European countries. However, only a knife and a wooden spoon are used to prepare food in a kitchen in the 3rd world. Because of such lack of resources in developing countries, it is not difficult to find people transforming, changing the original purpose or adding value to existing products (see the left example of Figure 1). This way of transforming existing products for different purpose is sometimes observed in developed countries as well. A good example is that there are people who hack IKEA products for their own pleasure (see the right example of Figure 1).


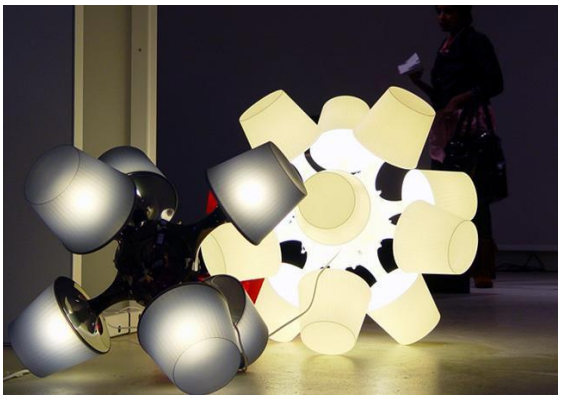

Figure 1: Examples of transforming the primary function of existing product to another function: newspapers for adjusting the height of chair (left) and hacking table lamps to a pendent lighting (right)

Historically, the phenomenon was explained first with the concept of unselfconscious design (Alexander, 1964). According to his notion of unselfconscious culture, people unconsciously design things for goodness of fit. As the unselfconscious process learned informally and iterative process over time, this culture existed before the advent of professional design and the culture is still shown in our everyday life. Dix (2007) supports creative misuse and suggest appropriated design of guidelines. Related with appropriated design, bricolage describes the practice that people invent appropriate artifacts immediately within everyday settings (Louridas, 1999). Also, DIY communities and amateur communities such as IKEA hackers have shown their appropriated redesign in specific their context (Rosner & Bean, 2009). This appropriation is in line with Alexander's unselfconscious process. Kim and Lee (2014) defined this term as 'everyday design' by defining a user as a more creative and proactive agent. Emphasizing the role of user, they addressed that the behaviors of people to designed products are not the result of design but the production of creative processes. Brandes and Erlhoff (2006) also introduces non-intentional design with cases of creative uses of products by users, not by designers. As many terms have been used to denote this phenomenon, the term *everyday design is used in the study* to emphasize the quotidian nature of this activity.

Considering discrepancies between expected context by designer and real context by actual users (Crilly, Maier, & Clarkson, 2008), bottom-up approaches have been increasingly emphasized and designers have adopted co-design approach for understanding and applying users' needs and ideas. Ihde (2008) and Redström (2006) emphasized the consideration of unintended uses and use of unintended users in product development process. In a sense that unselfconscious design provides designers with real context of users in interaction-oriented process and designers can get inspired with actual users' redesign (H. Kim & Lee, 2014), an understanding of this phenomenon could help to increase the satisfaction of users. Furthermore, it could also contribute to more sustainable design because people tend to use satisfied product longer. After Blevis (2007) introduced the term sustainable interaction design, many studies propose material effects of sustainable design. His focus was on the linking between invention and disposal, and finding opportunities in reuse product and materials. Odom et. al (2009) tried to understand the motivation or preserving and discarding artifacts. These studies provide a useful source of underlying framework of sustainable design.

When users encounter with a product, users can have information of a product through touch,

vision, smell, sound and action. Based on these information, users judge a product and utilize it as a solution. This explains solution-based design approach (Helms, Vattam, Goel, Yen, & Weissburg, 2008; Kruger & Cross, 2006). A good example is an abandoned antique table sewing machine that is reincarnated as a tea table for a café. As opposed to solution-based design approach, problem-driven design approach first considers understanding the a given problem with information and knowledge. The emphasis is on defining the problem, and then searching a solution. For instance, people put a pen between pages of a book to bookmark (Figure 2).

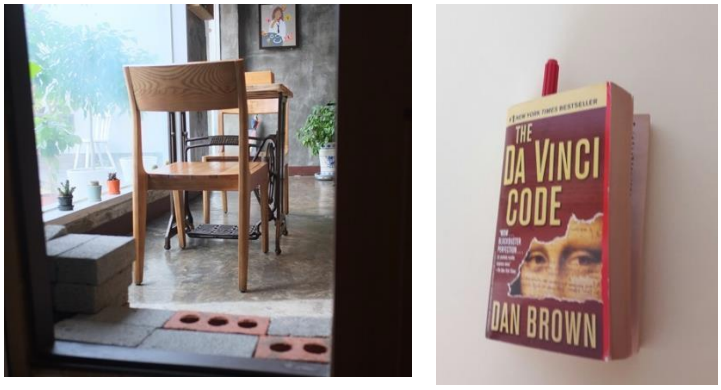

Figure 2: Examples of design approach. An antique table by solution-based design approach(Left). A bookmark by problem-driven design approach(Right).

Consumers purchase and experience a product for particular goals. This goal is the key to understand why people do everyday design. Based on previous theories of user experience, Kang et. al (2016) redefined five dimensions of user experience: sensory, instrumental, episodic, value, symbolic experience. Sensory experience is related with the human sensory system, the sensorial component of experience. We like the smooth texture of a fountain pen, and the beautiful shape of a chair, for instance. Instrumental experience is evoked from how easily and effectively instrumental goal is achieved. For example, some people like a coffee machine because they can save time and effort. Episodic experience is related with users' memories or episodes with a product. A father likes the necktie given by his beloved daughter for the first time in his life. Value experience is related with users' value, such as self-improvement, personal and common benefit. Some people love organic cosmetic because of environmental sustainability. Symbolic experience is generated from symbol or representation that a product socially stand for. For example, some people love Nike's running shoes because it represents young, energetic and urban health lifestyle (Figure 3).

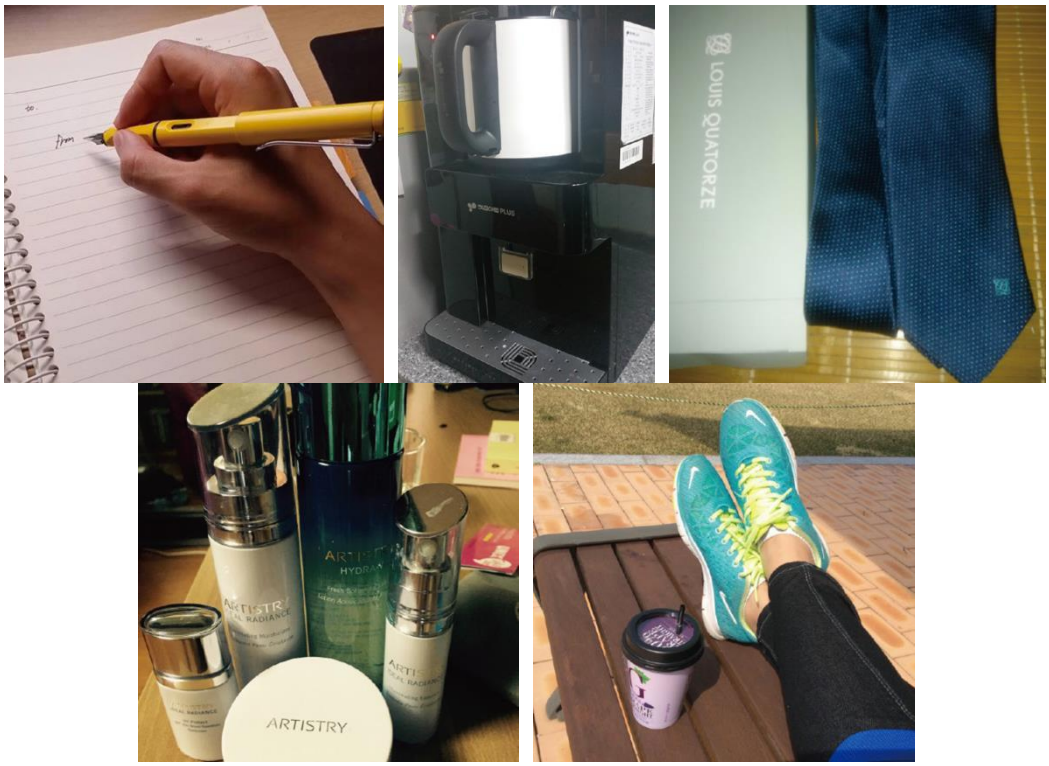

Figure 3: Examples of goals in positive experience from Kang et. al (2016). Sensory, instrumental, episodic, value, symbolic experience (from left to right).

From the perspective of recycling and habits, ways of reuse are presented by users. The principle is on reuse techniques combined with other prosperities to understand reuse composition of users' redesign: Reuse, Remake, and Remanufacture (S. Kim & Paulos, 2011). Reuse is defined that use of original products for other purpose then originally designed by simple operations. A good example is a lightbulb vase, which becomes a small vase for fishes. Remake refers to changing the functions of the original products with simple crafting and manufacturing. For example, to give a personal identification, a key chain is made of keyboard keys with alphabets. Remanufacture means a complete reconstruction of the original products with complicated ways with tools. For instance, can phones work like a phone through thread (Figure 4).

Figure 4: Examples of ways in transform. Reuse, Remake and Remanufacture (from left to right).

Although previous studies have emphasized the importance of understanding user's behavior in real context through the phenomenon of everyday design, there are no studies dealing with a holistic framework of how everyday design happen and what reasons motivate people redesign original products in a systematic way. In order to get a complete overview of all aspects involved in this everyday design, a conceptual framework was developed and is presented in Figure 5. The conceptual framework for this study consists of four agents working in unselfconscious design: a user as a principal agent interacts with product A under context A, and he/she redesigns product A to product A' for a best fit in context B. In the process of everyday design, three steps are involved: approach, goal and transformation. Approach refers to the trigger of unselfconscious design, and there are problem-driven and solution-based approaches. At the stage of goal, he/she targets expected experiences with his/her everyday design. Finally, transformation is applied to the original product in order to achieve the goal. This ends up with product A'.

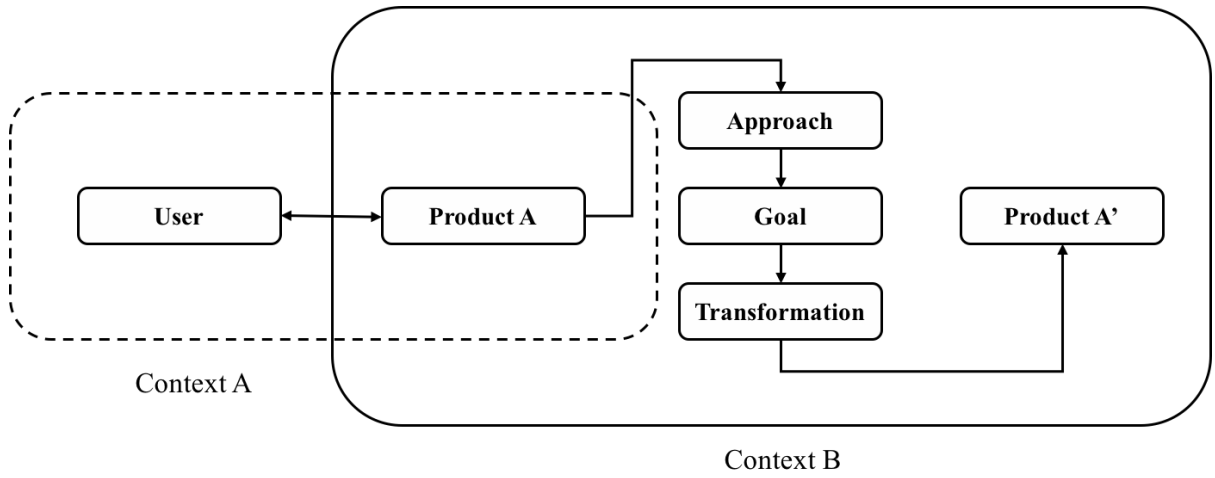

Figure 5: A conceptual framework for the study

Therefore, this study, as an exploratory study, attempts to empirically reveal if the conceptual framework of everyday design works in practice, under a premise that every user is a designer and they creatively and appropriately redesign and transform products. The objectives of the study include what triggers everyday design, what goals are set, and finally how it is transformed. In this way, this study could contribute to bridging the gap between intended use made by designers and actual use made by users and it could lead to sustainable design with products people love to use.

1. METHODS

This study has a characteristic of exploratory study to figure out the underlying mechanism of everyday design. Thus, a selection of everyday design cases was made among many of products in our everyday life.

1.1 Sample

For sampling in the study, two researchers spent two months hunting cases of everyday design in our everyday life. A total of 30 cases was collected through the method of photographic inventory collection (Desjardins & Wakkary, 2013).

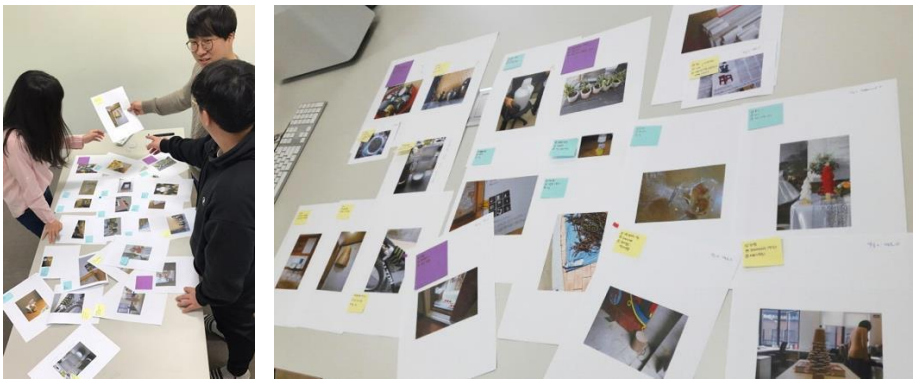

Figure 6: Sample cases collected for the study

1.2 Data analysis

Three researchers were involved in the analysis phase, whose background was industrial design and whose experience in design was more than five years. The photographic inventory was analyzed in terms of approaches, goals, and transformations. Because the cases were collected by taking photos without involving their users, the interpretation of the cases was made purely based upon the expertise and experiences of the researchers. With the interpretation, the cases were categorized in terms of similarity (Figure 6).

2. RESULTS

In order to figure out the underlying mechanism of unselfconscious design, the 30 photographic samples were analyzed in terms of approaches, goals and transformation and categorized based on similarity.

2.1 Products used for everyday design

Everyday products with low technology took up all the cases, which ranged from bricks and dishes to chair and hairclip: a person made a door step by laying bricks in front of the entrance, a broken dish was used for an interior item hung on the wall, a person was carrying a heavy bottle of liquid with the chair with wheels. A hairclip was used to stop up the plastic bag with breads (Figure 7).

Figure 7: Examples of unselfconscious design collected for the study

In the process of redesigning products from the original ones, there were two types of everyday design in terms of functionality. One is that primary functions designed by designers for a context are completely changed to fit for another context. For instance, a fire extinguisher

functions as a door stopper although its primary function is to extinguish fire. Another good example is that an ice cube mould is used for organizing pens on the desk (Figure 8).

Figure 8: Examples of primary function change: fire extinguisher (left) and ice cube mould (right)

The other is that a product is used for another context utilizing the primary functions given by the designer. For example, a plastic basket for cookies is used for putting fishes in. Clothes peg is also used for tying up electric cables of computer and its accessories (Figure 9).

Figure 9: Examples of maintaining primary function: plastic basket (left) and cloth peg (right)

It was shown that primary functions were changed in 57% of the cases while primary functions were maintained in 43% of the cases.

2.2 Approaches of everyday design

As previously described, there are two approaches by which people are triggered in the context of everyday design: problem-driven approach and solution-based approach. According to the analysis, problem-driven approach took up 67% while solution-based approach 33% among 30 cases (Figure 10)

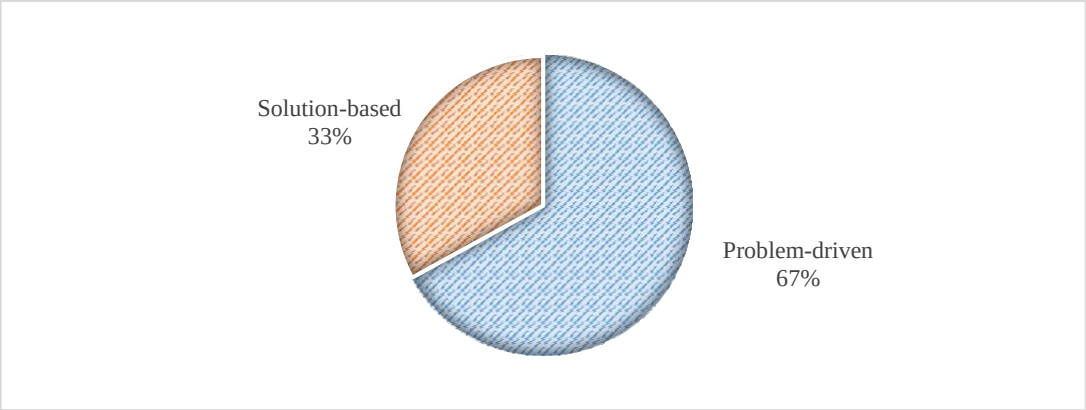

Figure 10: The percentages between problem-driven and solution-based approaches in the context of everyday design

A good example of problem-driven approach was that people use the back of a chair as a rack when they need to hang wet towel. The iron gate of the outside is an example of solution-based approach. The iron door became a table used in a café (Figure 11).

Figure 11: Examples of problem-driven and solution-based approaches: chair for hanging a towel (left) and iron door used as a table in a café (right)

2.3 Goal of everyday design

The five dimensions of positive user experience were used to identify goals of unselfconscious designs in the study. The most often mentioned goal was the instrumental experience (90%) (i.e. functionality, usability and efficiency) among 30 cases (Figure 12). For example, a plastic basket with many holes was used for drain remained water of dishes and bowls after washing dishes. This was followed by sensory experience (63%). A good example is that a Korean traditional pot used for making soybean paste or soy source became an umbrella stand in a company. Value experience took 37% of all the cases. For instance, packing materials for protecting fruits during transportation was used to cover plant pots. Episodic experience was mentioned in 17% of all the cases as goal of everyday design. A traditional winnowing basket that could be worn when children wet their beds was used as an interior item in a restaurant. Symbolic experience took up 17% of 30 cases. A good example of this goal is a sake lover who transformed a pack of sake to a case of tissue paper on the dining table. Figure 13 shows the examples with pictures.

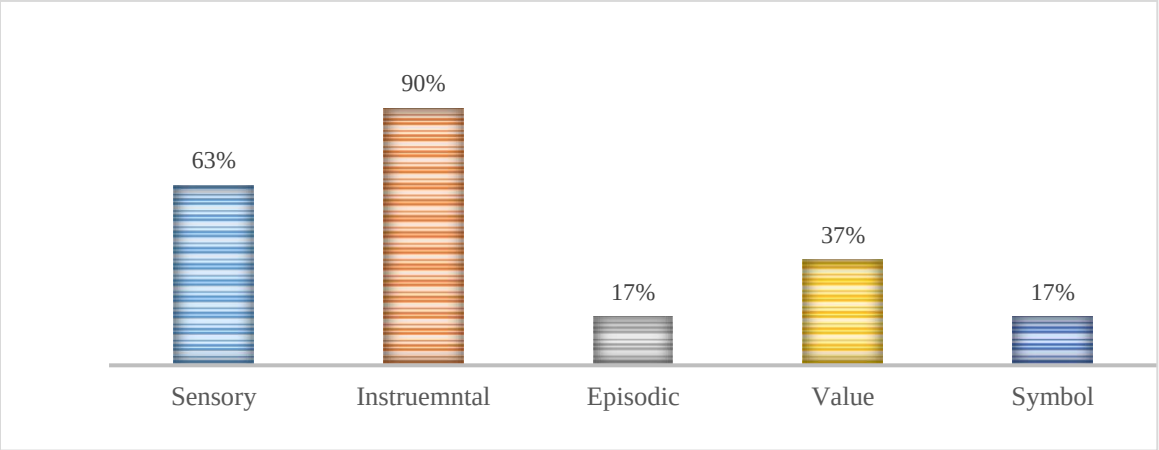

Figure 12: The percentages of goals in terms of five dimensions of positive user experience in the study

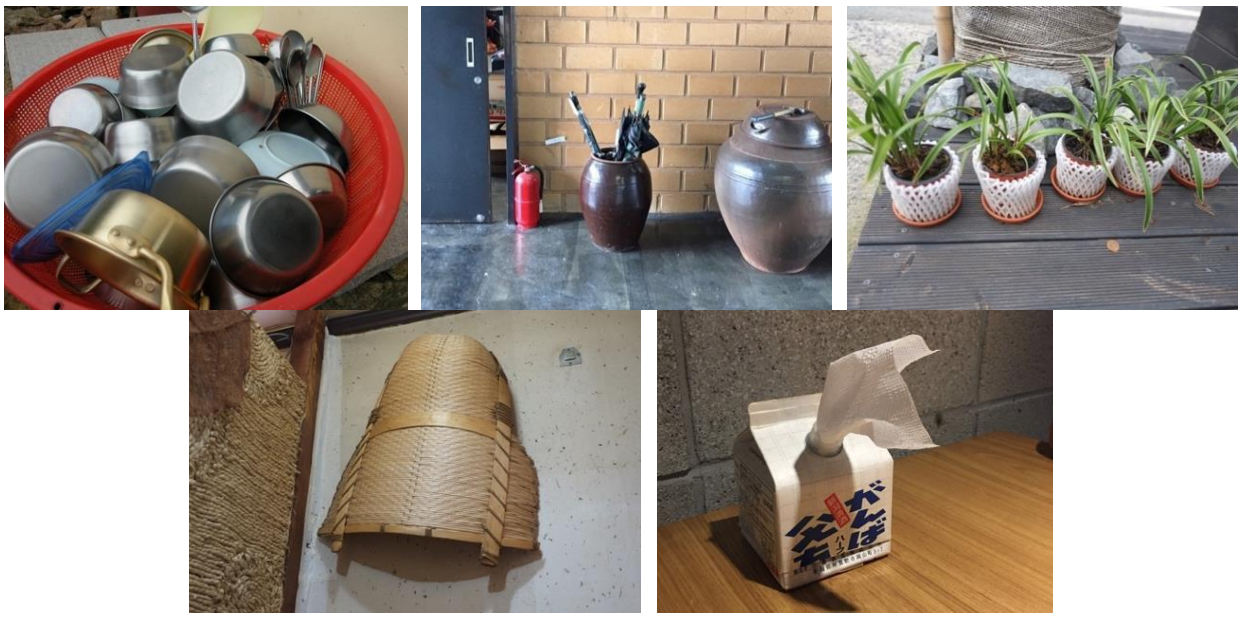
Figure 13: Examples representing each goal in the study

2.4 Transformation for everyday design

In term of the ways to transform the original products for everyday design, three dimensions such as Reuse, Remake and Remanufacture were adopted for the study. Remake cases took up the largest number of transformation with 50% of all cases (Figure 14). For example, a billiard cue redesigned as a pointer by making a hole on the billiard cue. Reuse cases had similar ratios with Remake ones (43%). A hairpin used for a plastic bag clip is a good example to explain the reuse transformation. Remanufacture cases took up only 7% of all the cases. For instance, a paper of receipt became the price tag of a book. Figure 15 shows the examples in pictures.

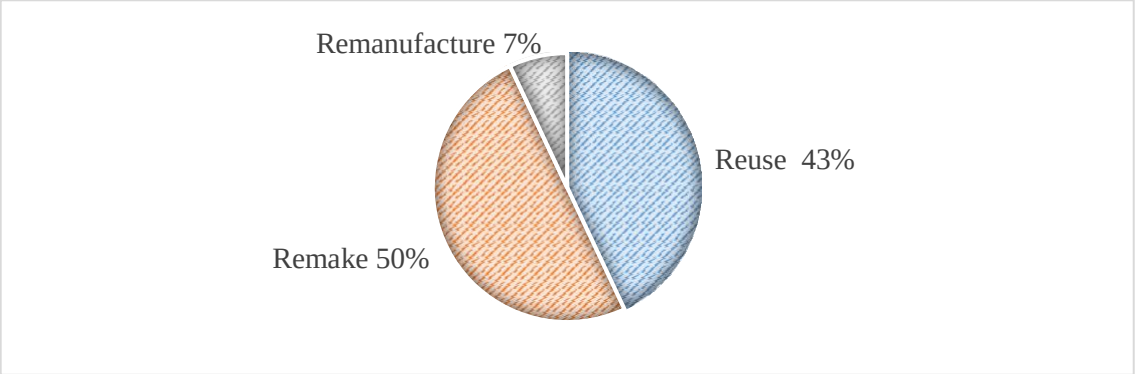

Figure 14: The percentages between Reuse, Remake and Remanufacture for transformation

Figure 15: Examples representing transformation in the study

3. Discussion and Conclusions

All the 30 cases collected for this research were products with low technology. A possible explanation is that the type of products would be perceived as easy and comfortable to transform considering the simplicity and the price. It might also imply that low technology products could be more sustainable than high technology products because the type of products mainly appears in everyday design. In the study, it was also revealed that transforming the primary function for best fit in a context is more observed than maintaining the original functions of a product in the context of everyday design. The implication of the finding is that people might have creative
inclinations dealing with redesigning their own products. Perhaps, it might have to do with their concerns about sustainability. Let say, they might come to be creative thinking again and again of how to utilize their products instead of discarding.

In terms of trigger to everyday design, problem-driven approach was twice more than solution- based approach. In the context of everyday design, it seems that people see their everyday products as alternatives to tackle problems they suddenly meet unless there are proper solutions to the problems. The goals that people redesign a product themselves could be explained with the five dimensions of positive user experience. Instrumental experience was most frequently mentioned for unselfconscious design. This result is in line with previous studies in which instrumental value explains the major reason of negative user experiences with products, and the value was ranked as most important factor that influences positive user experience (Kang et al., 2016; Kim & Christiaans, 2014). Interestingly, value experience was ranked higher in the study of everyday design than in the study on positive user experience

with products. It might imply that the value of sustainability is taken into consideration more in everyday design. There are three types of product transformation for everyday design. The number of Remake cases were the highest and this was followed by Reuse cases. Remanufacture cases were least reported. This result corresponds with the findings of Kim and Paulo' study (2011). The main difference between his study and this study is technology level of the cases used in the studies. In their study, e-waste which refers to high technology products were used while in this study, low technology products in our everyday life. Considering this difference and the similar results between two studies, it seems that the level of technology applied to products would not influence the way of transformation in the context of everyday design.

Design implications

This study tried to empirically evaluate if the conceptual framework of everyday design works in reality. The results show that everyday design could be explained better with the conceptual framework. Through the conceptual framework, the phenomenon could be better understood in a systematic way. If a better understanding of actual use of our everyday products in actual context is made in the product development process, it is expected that products can be better designed in a way to reduce the gap between intended use by designers and actual use by users and per se to
increase satisfaction with products. In this way, this study could contribute to more sustainable design because people tend to possess longer if a product deliver positive user experience through satisfaction.

Limitations of the study

Nevertheless, the study has limitations that include sample size and location. It is not sufficient to generalize the findings only with a total of 30 cases. And the cases were collected only in South Korea. As a creation activity, unselfconscious design might be influenced by culture. In addition, the goals of redesign activity were identified not by interviewing with the users but by the interpretation of researchers involved in the study, which might be biased. Therefore, a follow-up study is planned with a number of everyday design cases including diverse locations as wells as interviewing actual users.

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