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ONE PERSON'S TRASH CAN BE ANOTHER PERSON'S TREASURE: REDESIGNING USED OBJECTS

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Abstract:

Recently, many original products have started to use eco-friendly materials. More and more designers are starting to care about making products that are friendly to the environment. Still on the market, however, are many products that have already been produced, and there are still many not-eco-friendly products in production today. In light of this situation, this thesis examines how designers can redesign old, discarded products and materials, and how semiotics can analyse the redesigning of products in a way that can explain what makes old products have new value and meaning. Furthermore, redesigning used products will let people know that even trash can be transformed into treasure through redesign, encouraging more people to reuse and recycle. Explaining this philosophy is the goal of the thesis.

People like unique products. Design – a unique, functional, attractive design – determines a product's success; in addition to meeting the basic function of a product, a well-designed product can be a tool that helps us to communicate with other people, even to define our social groups. By analysing a product's semiotic mode, we can understand structurally how redesigning constructs the product as a special unit. The idea of humanism in the philosophy of redesigning a product is an advantage compared to mass production; as a researcher, I hope there will be more and more consumers who pick up the hobby of redesigning products.

Keywords: Sustainable product design, semiotics, Upcycling

Other information:

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Glossary

Cradle to cradle - as in nature, there is no such thing as waste, no having to do without, no limitations. Using biological and technological nutrient cycles, the right materials are brought to the right place at the right time. (Braungart, 1987)

Cradle to grave - Resource are extracted, shaped into products, sold, and eventually disposed of in a "grave" of some kind, usually a land fill or incinerator. (Braungart, 2002: 27)

Danger cycling - Some materials are being recycled into products that could pose hazards to the user. (Thorpe, 2007: 45)

Design for recyclability (DfR) - is a design philosophy that tries to maximize positive environmental attributes of a product, such as ease of disassembly, recyclability, maintenance, reuse of refurbishment, without compromising the product's functionality and performance. (Fuad-Luke, 2002: 339-341)

Design for recycling (DfR) - considers the best methods to improve recycling of raw materials or components by facilitating assembly and disassembly, ensuring that materials and components. (Fuad-Luke, 2002: 339-341)

Downcycling -The practice of recycling a material without defining its future use(s). This results in greater entropy and therefore a decrease in the value and potential of the material for future uses. (Braungart, 2002: 56)

Ecodesign – is a design process that considers the environmental impacts associated with a product throughout its entire life from acquisition of raw materials though production/manufacturing and use to end of life. At the same time as reducing environmental impacts, ecodesign seeks to improve the aesthetic and functional aspects of the product with due consideration to social and ethical needs. Ecodesign is synonymous with the terms design for environment (DfE), often used by the engineering design profession, and lifecycle design (LCD) in North America. (Fuad-Luke, 2002: 339-341)

EcoReDesign (ERD) – was first coined by the Royal Melbourne Institute of Technology, Australia, to denote the redesigning of existing products to reduce the environmental impact of one or more components of product. (Fuad-Luke, 2002: 339-341)

Green design – is the attempt to make new products and processes more environmentally benign by making changes in the design phase. (Hendrickson, 2010)

Semiotics – the word “semiotics” comes from the Greek root, seme, as in semeiotikos, an interpreter of signs. Semiotics as a discipline is simply the analysis of signs or the study of the functioning of sign systems. (Paul Cobley and Litza Jansz, 1998)

Sustainable product design (SPD) – is a design philosophy and practice in which products contribute to social and economic well-being, have negligible impacts on

environment and can be produced from a sustainable resource base. It embodies the practice of eco- design, with due attention to environmental, ethical and social factors, but also includes economic considerations and assessments of resource availability in relation to sustainable production. (Fuad-Luke, 2002: 339-341)

Raw materials – An unprocessed natural material that is used in manufacture. (Hanaor 2006, 242-243)

Recycle – To adapt or process used or waste material so that it can be converted for a new use or used again for the same purpose. (Hanaor, 2006: 242-243)

Upcycling -The practice of recycling material in such a way that it maintains and/or accrues value over time (the opposite of downcycling). (Braungart, 1987)

Virgin materials – New materials or those which have not yet been recycled. Used materials have to compete in the marketplace with new (virgin) materials as cost of collecting and sorting the materials usually means that they are equally or more expensive than virgin materials. (Hanaor, 2006: 242-243)

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Chapter 1

INTRODUCTION

1.1 The aims of the thesis

The aim of the thesis is to analyse how to redesign no-longer-useful daily objects and how this can become an upcycling process through semiotic analysis. At the same time, I hope to add to the pool of knowledge on sustainable-environment issues. As this thesis is my first opportunity to explore in depth a topic that reflects my personal green thinking, I hope through the thesis to express my deep concern for environmental issues and to communicate my personal desire to improve the environment.

In this thesis, I will also explain concepts that relate to recycling, such as downcycling. I was not even familiar with the words ‘downcycling’ and ‘upcycling’ before I started this research. I used to think that all recycled materials were helpful in saving energy and environment resources, but this is not actually the case.

‘Downcycling’ refers to a process that reduces the quality of the materials involved with repetition, (Braungart, 2002) and the opposite word, ‘upcycling’, means to use things in a creative way to convert something from valueless to valuable. Upcycling processes decrease the number of valueless objects sent to landfills and thus contribute to an improved environment in a clever way. With upcycling, nothing has been thrown away and something has been reborn from upcycling and the new item is put into use when we close the loop (Gardiner, 2010).

I am pleased to have an opportunity to do research that focuses on the agenda of

improving the environment because I enjoy doing and feel a responsibility to do pro-environmental activities. Doing this research also gives me the opportunity to expand knowledge of green design in my native country, where no information about green design is available in my native language. I hope that others will share my desire to improve our collective knowledge in this area and protect our Earth. Through expanding knowledge of redesigning, I can try to let people to know how what is currently dismissed as ‘garbage’ could be given a function, rather than being thrown away to cause environmental damage.

As the pace of civilization has accelerated, we have taken more and more natural resources from environment. The book *Designer's Atlas of Sustainability: Charting the Conceptual Landscape through Economy, Ecology, and Culture* mentions that this is a key culprit in global warming (Thorpe, 2007). Thorpe asserts that one of reasons for global warming is that people utilize apparently limitless natural resources such as those found in the lithosphere (in what we commonly call ‘the ground’). However, after we use utilize those resources and discard the remainder when we are done with the product, those resources cannot become an integral part of the lithosphere again. Additionally, the degradation of such products may produce toxic elements to destroy our environment. The long-term results of these activities include shortages of natural materials and environmental pollution.

As issues like those listed above have garnered attention, many efforts in recycling have been initiated. Jeffrey Morris of Sound Resource Management, a consulting firm based in Olympia, Washington, says, ‘If you can use recycled materials, you don't have to mine ores, cut trees and drill for oil as much’ (The Economist, 2007). Data cited by the *Economist* shows that recycling metals rather than extracting

metals for use could reduce energy consumption by over 50%. For instance, in comparison to extracting new aluminium to create a product, recycling aluminium can reduce the energy cost of that product by 95%; 60% for steel. In addition to potential energy savings from recycling metals, recycling plastics yields an energy savings of around 70% in comparison to creating new materials; 40% for paper; and 30% for glass. The same article asserted, 'Recycling also reduces emissions of pollutants that can cause smog, acid rain and the contamination of waterways' (The Economist, 2007). These statistics indeed present strong advantages of recycling programs.

However, not all connotations of the word 'recycling' are positive; there are also disadvantages in recycling. For instance, when we mix metal materials such as copper, nickel and manganese, recycling makes decreases the quality of the materials, and the value of those metal materials are lost forever (Braungart, 2007). In addition, the use recyclable paper for newsprint causes more water pollution than the production of paper from 'virgin wood' does (Braungart, 2007). In some recycling processes, the value of the lost element is not the only cost involved, there is also an energy cost. These situations are examples of what 'downcycling' is: the recycling of a material into a material of lesser quality (Mickey Z, 2008). Hence, reducing the use of raw materials and finding ways to resolve used materials are equally important tasks for the modern environment.

Ann Thorpe (2007:10), in *Designer's Atlas of Sustainability: Charting the Conceptual Landscape Through Economy, Ecology, and Culture*, speaks of 'a chair made of wood, a building made of cement', meaning that designers should know how different materials function for different purposes and that, since they take

these resources from nature, designers bear responsibility for the impact of their design on the environment. Moreover, designers also need to consider economy and culture because those are related to each other in a society; one of the goals of design is to address this relationship (Thorpe, 2007). Furthermore, the Canadian designer Alexander Manu says, ‘design holds the potential to create, not only new objects, but a newly responsible social order’ (Manu, 1994:11). This clearly expresses the relationship between environmental issues and the design of products, and Stuart Walker states that sustainability in product design is ‘clearly complex and multifaceted’ (Walker, 2006: 20). Although this topic has been discussed for a long time, as times change there are always new challenges in sustainability and product design, so the task is never complete.

Based on the information above, I looked for successful samples of design where old objects or recycled materials have been used to upscale products, in line with the topic of my thesis: One person’s trash can be another person’s treasure: redesigning used objects. These examples of design show that instead of being downcycled to a landfill, an old object could become a valuable product (again) through design. Upcycling makes an old product become more valuable in its new life. The upcycled item has new meanings that make customers think about the concept of the re-design.

My research method in this thesis is based on semiotic analysis. I first benchmarked successfully redesigned products and then used semiotics theory to analyse the products. I collected a sample of successfully redesigned products and company examples, and I then used semiotics to analyse the sample. Finally, I interpreted the product examples into signs and examined the meanings of the signs. Based on

Krippendorff's (2006) explanation on research about design, my thesis produces new information about design. This research about redesigning products is contributing to research knowledge about design, with semiotic analysis as to the analysis.

1.2 Earlier research in the field

A few decades ago in my country, Taiwan, there was an occupation of *ragpicker*, which was the job of collecting all sorts of useless stuff such as books, newspapers, clothes, broken household appliances, broken bikes and so on from households. The ragpicker would then sell that useless stuff to a recycling centre. In the recycling centre, they would repair objects and separate different materials, selling the repaired objects at reduced prices and the sorted materials to factories. Most families were not rich during that period, and people treasured what they did have more than people do now that the society is more prosperous. This is an example of the phenomenon that Victor Papanek (1995: 30) mentions, 'when life is hard, nothing is wasted.' That society, at that time, had a somewhat organised system to extend the lifespan of products and materials by many years.

In term of western countries, the British author Ann Thorpe (2010: 8-9) explains that people in the past had an 'experienced tuned consciousness through activities', so the focus of possessions was on having and preserving practical things in daily life, such as making things for wearing, eating and so on. Until recently, I could still see the phenomenon of 'experienced tuned consciousness through activities' (Thorpe, 2010) in the countryside of western countries, but I seldom observed it in big cities while I studied in Europe.

As time has passed, standards of living have increased sharply through economic growth and planning, and more families can afford new products than could a few decades ago. Moreover, modern product are updated more often and generally function better with prices lower than before, a phenomenon that is particularly common with high-tech products. William McDonough and Michael Braungart explain this trend in their book, *Cradle to Cradle*, explaining that high-tech products are created from low-quality materials: cheap plastics and dyes that are globally sourced from the lowest-cost provider (Braungart, 2002).

In fact, these practices aren't limited to the high tech market; that kind of low-quality, mass manufacture is utilized for a wide variety of the stuff we use, the things we see, the food we eat and so on. People will never be satisfied with what they have now; they always pursue more things, so they will always purchase goods. It just proves, as the author of *The Green Imperative Ecology and Ethics in Design and Architecture* declares, 'Objects alone can never fulfil real human needs and longings' (Papanek, 1995).

From the user's point of view, the downward spiral of high-tech prices is an advantage; consumers can get high-tech products for low prices. This is also, however, why people do not treasure products like they did before: those products are much less expensive than their equivalents were a few decades ago, and people can more easily afford them. End users can easily buy a replacement item and throw away the old one when it has a problem or when a brand new product shows up. Additionally, in terms of making purchases, Mihaly Csikszentmihalyi (2000) notes that 'in contemporary life, shopping is one of the main areas where many people experience a tuned consciousness, in the absence of other opportunities or skills.'

(Thorpe, 2010). On the other hand, from the point of view of the environment, high rates of product consumption cause many different forms of pollution such as air pollution, littering, noise pollution, soil contamination, radioactive contamination, thermal pollution, visual pollution, water pollution and so on.

Since this situation described above is an endless cycle, raw materials will soon be in short supply. In 1987, the United Nations' World Commission on Environment and Development advocated that industrialism should take responsibility to 'minimize irreversible adverse impacts on human health and the environment' (Braungart, 2002). Manufacturers must do what is necessary in choosing materials or processes during manufacture, such that the manufacturing creates less pollution and waste and uses more renewable resources. We already know the waste hierarchy of reduce, reuse and recycle, and there are additional ways to deal with waste such as regeneration, repair and refuse as well as other strategies that can be applied in our daily waste object life-cycle system.

It is also true that sometimes when we try to improve the environment, we just waste energy or resources or make the waste disappear temporarily. In the book *Cradle to Cradle*, the authors assert that most people, including producers and consumers, do not have enough knowledge to handle junk or to understand why 'doing less bad is not good.' For example, 'most of recycle is downcycling' (Braungart, 2002) and we think that recycling is automatically a good thing for environment, but actually quite a few recycled materials are more valuable if not mixed with other materials.

A good example of downcycling material is plastics. We use a lot of plastics items

in our daily lives because plastics are very flexible, lightweight and cheap materials. This also makes plastics easy to waste. ‘In 2005 less than 6% of the plastic from America's municipal waste stream was recovered’ (The Economist print edition, 2007). Even when plastics are recycled, they are just transferred to another even more cheaply made material to produce items ‘such as plastic lumber (used in place of wood), drain pipes and carpet fibres, which tend to end up in landfills or incinerators at the end of their useful lives’ (The Economist print edition, 2007). That end will come more quickly because mixed recycled materials make low-quality products. Only PET and HDPE plastics are eligible for food-grade, bottle-to-bottle recycling to prevent downcycling.

Furthermore, Ann Thorpe states that some kinds of downcycling can even become ‘dangercycling’. For instance, downcycling steel from car components yields a product that also contains paints and plastic residue; this can become a toxic source by refabricating downcycled steel. Contaminants are one source of ‘dangercycling’ (Thorpe, 2007). Dangercycling sometimes also happen carelessly. For example, the clothes we wear could be made from polyethylene terephthalate (PET) soda bottles; this recycled material composition may not be safe for prolonged contact with human skin because ‘The bottles contain the toxic chemical antimony, potentially harmful plasticizers, ultraviolet (UV) stabilizers, and other chemicals’ (Thorpe, 2007).

Those quotations remind me that a decade ago, my home country of Taiwan began to forbid supermarkets, restaurants, shopping malls and so on to provide free plastic bags to customers. If customers do not bring their own bags, they still can buy ‘thick’ plastic bags from the shops. Shops replaced the thin plastic bags with thick

ones; because they were going to sell them, they provide higher-quality plastic bags. Most customers used to use the thin plastic bags for garbage bin bags, but after the institution of this new policy, people began to have to buy new plastic bags for garbage bin bags. Since the institution of the policy, and especially in the early years, a lot of thick plastic bags were produced and sold. Fortunately, I seldom see those thick plastics bags anymore because people are now more likely to bring their own bags when they shop, and stores returned to using the regular thickness plastic bags. Some people began used other recycled materials to make their own shopping bags, utilising discarded products such us coffee packages, curtains, jeans, sheets and so on.

However, people still cannot live without plastics. I read the article *The Truth of Recycling* from the Economist magazine on the internet; it mentioned that the most downcycled material is plastic, but we cannot live without it and use it in products such as cars, televisions, personal computers and so on. Plastics are not just for packaging; they appear everywhere. Plastics can easily appear in designs with other resources such as metals and glass. These multiple-materials products are the most difficult and expensive to recycle, as they must first be dismantled for proper recycling (The Economist print edition, 2007).

From the data above we can see that downcycled materials not only decrease in quality but may also contain toxins when utilized in new products, and this causes additional environmental pollution. To avoid this cycle of problems, redesigning old objects into new products might be a solution for saving raw materials, consuming recycled materials, saving energy and reducing pollution. Redesigning new products from old ones is a process that spares the energy otherwise spent making old objects

into recycled materials. Consumers should still be informed what kind of old objects were used in making the new product. By using less energy, the impact on the environment from used products will be drastically reduced.

We are all responsible for our environment. From the hierarchies of waste, we also teach children how to improve the environment. A common thing we find in schools is using recycled objects to create art in art class, but when the semester ends, that art is still going to become trash in a garbage bin heading to a landfill because creating that arts, the children combine different materials, making the product more difficult to recycle. Papanek (1995: 211) discusses this practice happening with both British and American students. He even points out that ‘British and American students have taken rubbish, turned it into ornamental rubbish, and then been told that they have created art.’ Education should teach principles that work in our lives and our world. Realizing this made me feel that I have been advocating wrongly for ways to help the environment for so long (e.g. downcycling).

Actually, this highlights a basic difference between art and design. Design is oriented towards usability and the use value of things, while art concentrates on ‘waking people up’ to environmental issues etc. By contrast, a product is a ‘real thing’ (Dilworth, 2001) and it differs from artwork. Most products are invented because people need them. The goal of a product is try to satisfy the user and be functional, to let people ‘perceive the product, judge it and probably appreciate it’ (Seyed Javad Zafarmand, 2003).

The field of redesigning products lies somewhere between art and design. John Dewey says a product of art, such as a temple, painting, statue or poem, is not the

work of art. Those works are created for mankind to cooperate with the product; therefore, the result comes from the experience of the interaction with the product, an experience that everyone can enjoy because it has 'liberating and ordered properties' (Dewey, 1934: 222). Hence, redesigning products yields a hybrid product mixing artistic elements and usability issues. The hybrid product might not be the most practical or pleasurable to use, but they remind their users and observers of their users about the same ideas and ideals that art does. It is a kind of relationship between product aesthetics and sustainability.

To illustrate the concept above, I cannot easily find many examples from artists' or designers' collections. Though many products have a strong concept, most of them are not really helpful for the problems that we need to solve. As a result, I began to think how trash can become a really valuable and meaningful treasure through redesigning for mankind.

1.3 Purpose of research

With the increase in global warming, the environment has changed; there are more shortages of resources and so on. People have also taken action toward improving environment. However, we might not always do the right things in our attempts to improve the environment. Sometimes we just waste time and more energy. To quote from the book *Product Development and the Environment*: 'Public interest in environmental issues has been growing steadily since 1960s' (Burall, 1996). This growth of public interest is still seen today. Recently, we can see many products of great originality, and some of them start from redesigning useless objects. What does redesigning a useless object mean? Redesigning is when designers give a new function or a new look to an old object that is not in use any more or has been

replaced by a new object. Therefore, the useless object can have a new life with new usage. This conversion may not be able to completely rescue the raw materials, energy and environment, but people are reminded about improving the environment when they purchase or see redesigned product. The METAMORPHOSE project's informational site mentions that an 'object can have a second life', although 'new' products are made from 'old' (METAMORPHOSE, 2006). The purpose of this research is making useless become valuable and/or meaningful. Another commonly used term is 'repurposing'; this term is explained in the thesis *Design for Repurposing* as creating new way to use existent products or add elements to the old product for its second life (Aguirre, 2010). Those definitions are very close to the target of my topic.

This type of re-design could reduce the energy because the total destruction of old products to try to recover the usable material is not necessary. Thus, when people do redesign or repurposing, the material's quality will not generally be decreased. This thinking is emphasized in the book *Cradle to Cradle*: 'Most of recycling is actually *downcycling*, it reduces quality of a material over time' (Braungart, 2002). The authors of *Cradle to Cradle* also discuss how making creative products from downcycled materials may be misguided, even though the intention is good. That is to say, the best solutions for improving the environment are producing less and disposing less, not recycling (Braungart, 2002). For the reason, a designer will be an important figure in this process.

When a designer designs a product, he or she also thinks about the process of recycling. How do we reduce pollution? Sources of pollution to not only lie in the method of production, but also in the method of recycling (McDonough, 2005). If

designers could design more environmentally and penetrate the market with those designs, then that would help companies in saving and avoiding buying raw materials, while users still get benefits from the products. With this strategy, our earth's environment will be stop being destroyed and economics will improve because sustainability is strongly linked to the idea of 'local' production (Walker, 1998). Hence, designers around the world should try to 'think globally but act locally' in their own design area (Fuad-Luke, 2002).

Environmental issues began to be discussed in public in the 1960s. (Burall, 1996). As we have seen, more and more product designers are doing sustainable product designs. On the other hand, there are considerable quantities of products on the market that have been mass produced cheaply until now.

When new, more modern goods are introduced to market, customers are accustomed to throwing away their old products and looking for new ones. New products always attract people. The data shows that new products are manufactured every day and old ones eliminated through competition in the United States; over 90 percent of the materials used in producing durable goods becomes waste very soon (Braungart, 2002).

On the other hand, in northern Europe, many people are used to buying things at the second hand shop when they need something; items are also sold to others when people are done using them. The Finnish newspaper *Six Degrees* published an article called, 'Green is the new black'. In one paragraph the author, Johanna Forsblom, mentions, 'People have always bought second-hand things, but probably never as much as today. New, trendy second-hand stores are popping up

everywhere' (Cheyney, 2009). This principle does not only apply to fabrics, but could also be applied to others materials. Redesigning and repurposing practices will make old products have new value, and this type of design could avoid needless consumption.

As we know, most artefacts are made from natural resources and at the end of the product's lifespan, these resources would return to the natural environment (Thorpe, 2007). Modern products, on the other hand, from the beginning of the production process to the end of the product's lifespan have a much greater negative impact on the natural environment. It is a vicious cycle in an industrialised system. Redesigning used products maybe pause the cycle in industry and at the same time encourage people to remember that even the trash can be transformed into treasure through redesign. It's also important to keep in mind that mixing various materials could cause problems with recycling, as I mentioned in the previous section.

Design is not just for the aesthetics, it has potential to influence customers to think about the concept of product (Walker, 2009). This idea can also be studied through the design examples I have collected for my research. A simple example of redesigning products is TranSglass, which is a collection of glassware made from recycled wine and beer bottles, yielding products such as vases, candle holders, carafes and tumblers. TranSglass may not be the first company to redesign recycled bottles, but they are succeeding in translating useless stuff into valuable products.

The TranSglass process cuts a part of the glass away from the original shape of recycled bottles and then create a nice shape for the glassware. From a simple design, this glassware became a modern design product. Studio Tord Boontje

mentioned that their idea just comes from what they already have. They take away a part of object, create an appropriate design, and transform the old object into a beautiful product. The sharpness of form and the original colours are prime elements that are found within bottles; that is also a goal that can express the team's positive attitude towards the environment (Boontje, 2009).

From TranSglass's example we could still recognize the products were redesigned from a useless beer bottles, and the price absolutely becomes many times more expensive than the bottle of beer that it was before. From TranSglass's series of products, we can roughly understand what kind of product redesigns they do. In Chapter 3, I introduce more product redesigns that are the experiments of redesigning products and successful redesigning companies. The experiments of redesigning product that I chose include the Studio Hergebruik / Re-use Studio and Klinik der Dinge (The Clinic of Things). These are focused on local marketing and on creating items that are hard to mass produce. The successful redesigning companies – Freitag, Worn Again and Globe Hope – are larger scale producers of redesigned products. Most of these items, which sell all around the world, can be easily purchased by customers through the internet.

1.4 Research question

On the basis of these research points, I will address the main question, which is based on Findeli (2008): How are the three spheres of sustainability – economical solidarity, individual cultural spiritual liberty, and social equality – presented in the research data, both in product and company examples? How is upcycling and redesign represented through promotional material? This is studied with the help of Mattozzi's semiotic analysis.

The answers for the questions on individual cultural, spirituality, liberty and social equality can be found through analysing the products. These analyses follow the pattern of Alvuse Mattozzi's (2010) semiotic analysis, and the data that I collected from the companies. I can determine these features from the analysis, and the concept from those companies.

1.5 Research method

Through semiotic analysis of the sample data we learn more about redesign and its meanings. Why do people do it, and why do people buy it? What are the meanings behind it? How does it influence people and the environment? Therefore, I construct an analysis framework that consists of three themes to determine the answers to the questions mentioned above and to answer the main research question of thesis.

Here are three directions of the research:

1. Look for key features in redesigned products and think about the question that is based on Findeli's 'Sustainable Design: A Critique of the Current Tripolar Model', or 'Comprehensive economic (or economics with capital E), social equity and human creativity' (Findeli, 2008).
2. An example of a redesigned product that can show what kind of product is a redesigned product and shows how it can be as popular as a mass production product: collect successful cases of redesigned products or companies and use semiotics to analyse one of the redesigned products.
3. Through the cases of redesign products or companies, analyse redesign aspects and learn limitations from the cases. Hence, the viewpoint can be from a variety from different aspects.

1.6 The concept of re-designing

The core of the redesigning concept is ‘to get more from less: more product or service value with less waste, less resource use or less toxicity’ (Braungart, 2007). The concept is the same as the context: eco-efficiency. Additionally, it includes the concepts of:

- dematerialization,
- increased resource productivity,
- reduced toxicity,
- increased recyclability (downcycling), and
- extended product lifespan (Michael Braungart, 2007).

As in the statements above, those concepts can emphasize the points of the product redesigning process. The process of the redesigning a product mainly starts from collecting useless objects, such as old truck tarpaulins, second-hand seat-belts, old bicycle inner tube and so on. Chapter 3 gives a variety old objects transformed into different creatively redesigned products. After useless objects are collected, reconstruction of those objects will begin by cleaning those objects before production or manufacture, and then those objects become useful materials again through a redesign process by a creative designer. Finally, the newly produced product is reborn. The process is just like Image 9, the concept of Worn Again; Freitag and Globe Hope are companies that have similar processes. The concept process from the Image 3, the concept of Klinik der Dinge, is a little different from that of Image 9, the concept of Worn Again. The concept of Klinik der Dinge mainly services local people and a small group; they receive ‘old’ and ‘sick’ objects from those customers and ‘cure’ them; those ‘old’ and ‘sick’ objects are transformed into newly functional products, so the customer can use them again. That is also a reason

that I create two categories of redesigning aspects cases in Chapter 3; one is kind of experimental redesigning product only provided to a small group, and the other is redesigning products on a larger scale, providing more greater quantities for customers. The companies in the second category are still not bigger than general companies that mass manufacture products.

According to Victor Papanek in his book *The Green Imperative Ecology and Ethics in Design and Architecture*:

> There are reasons that many designs have a very short life and some are virtually ephemeral. First, industry can gain profit through frequently satisfy legitimate artifice. Afterward, they can blind pursuit of greed more recently by introducing new fashions in tools and artefacts. Hence, 'products are frequently superseded by newer or better – or seemingly better – inventions that demand a new shape. (Papanek, 1995)

Reflecting the logic of Victor Papanek, those things happen frequently in our lives. For instance, one of my friends, who seems care about environmental issue, does not eat beef because she knows that cows produce pollution; she even encourages people around her to take the same action. On the other hand, she cannot stop herself from changing her mobile phone or digital camera every two or three years, nor does it impact her compulsion to buy new shoes even though she already has more than sixty pairs.

Obviously, the example of my friend illustrates how customers are heavily influenced by marketing and adverting (Thorpe, 2010). People do not seem to be

able to stop themselves from incessantly purchasing new stuff, even they have environmental common sense. This is because, as John Doerr pointed out in his speech, ‘Salvation and profit in greentech’, ‘It is hard to change consumers’ behaviour, because consumers don’t know how much stuff costs’ (Doerr, 2007). Doerr does not mean how much money we spend on products, he means how we will pay for costs to our environment. Sometimes things take time to realise, and lead to regret once we know.

In other words:

> Contemporary consumer capitalism actually abhors products that possess enduring usefulness values. On the contrary, capitalist system demands products that are short-lived so that newer models can be sold, thus driving the market. Without this kind of product replacement through consumerism our Western economic system would simply collapse (Walker, 2003).

The same situation happens in Asian countries. Referring to these issues, the author Stuart Walker referred to ‘a philosophy of sustainable design’ in the research journal *Light Touch - The Design of Ephemeral Objects for Sustainability*. Walker says a philosophy of sustainable design should connect people and the natural world with the development of much more respectful, responsible and reciprocal relationships. Sustainable design cannot just bring things and people together with objectification and exploitation. The philosophy of sustainable design is that people need not only to see the expense of an object to be ’downsized’, but people also need to think about ‘the intrinsic value and welfare of people involved’ (Walker, 2003). From this point of view, a redesigned product has many elements within its intrinsic worth that need to be shared with consumers.

A similar theory to that discussed above is from Seyed Javad Zafarmand, Kazuo Sugiyama and Makoto Watanabe. These authors discuss changing consumers' viewpoints about environmental awareness of products; the easiest way to do this is through experiences, by imagining what it would be like to be in an object's situation. And then the consumer's view will based on an understanding what an object is made from and also knowing how it is constructed (Seyed Javad Zafarmand, 2003). That points out the need to work on users so that everyone can have the same philosophy as the researchers, scholars and designers and so on, based on a shared understanding of objects.

1.7 The viewpoint of the design

It is better that redesigned products be good products, as attractive as other fine products to attract consumers to buy them. As Paul Burall says, 'For some products, more effective way of ensuring product durability is simply to make the item so attractive that no one wants to throw it away antiques world shows how good design can be long valued and long lasting' (Burall, 1996).

Due to changes in product design beginning in the 1930s, the product first shows up on the market (The New York Times, 2011). Product design is a key point in the product lifecycle that can effect environmental change throughout the product's life. Today, there are more products made from recycled material on the market because many people are beginning to change their attitude towards the environment due to looming shortages of natural resources and ecological transformation; people are really thinking about the problems of ecology, community, environment and so on. Hence, the question of how to reuse material is an important one today. It must be 'a

key element of human creativity driven by resourcefulness and necessity' (McDermott, 2007).

As a result, the research from the case of redesign that we will examine also aims to probe into the question of what kinds of redesigned objects people are already attracted to. Hence, the viewpoint of design is that numerous people care about the environment, but how many of them will buy a redesigned product rather than a new and un-ecological product? In the book *Cradle to Cradle*, the author describes the mood of people when they purchase a new product. Most people only buy a brand-new product, which means that it is made of materials that are 'virgin', because they enjoy the feeling that the product really belongs to them from the first second (Braungart, 2002).

From that point, it is clear that, since raw-material products are mass-produced, the price of those products will certainly be lower than that of a redesigned product. , Because most of people love brand-new products, a brand-new product and a redesigned product cannot be marketed in the same way. The redesigned product should sell for a different purpose because redesigned products have unique features compared to mass-manufacture products.

Stuart Walker says, in the *Design Issues* journal, that the relationship of sustainability and product design has been discussed for many years. The relationship between those two subjects is complex and multifaceted. The most frequently presented issues arise in terms of product life cycle, materials, manufacturing and environmental concerns. Meanwhile, the design of longer-lasting products, which is the link between products and services, is constantly pursued.

These actions represent significant improvement for contributions to sustainability (Walker, 2006). The act of redesigning products from useless objects can hold the key to sustainability from Stuart Walker's point above, with respect to product life cycle, materials, manufacturing and environmental issues. This also meets the qualifications of the concept of eco-efficiency as I presented it in the beginning of this chapter. First, redesigning the product itself extends product life cycle (dematerialization, increased resource productivity and extended product lifespan). Second, redesigned products do not need extra raw materials to produce the product, (increased recyclability). Third, because recycle old objects do not need to become raw material again, this process does not consume as much energy (reduced toxicity).

Chapter 2

SEMIOTICS OF REDESIGNED PRODUCTS

2.1 Product Semiotics

In the field of semiotics, there are several orientations defining the concepts of semiotics. John Fiske (1990) referred to the most influential semiotics. Various scholars proposed the science of semiotics in the early 1900s. One of orientations dates back to the linguistics work of Ferdinand de Saussure (1857-1913), who expanded and diversified the field of signs in ways that were completely unanticipated in linguistics (Copley, 2000). Another approach comes from the founder Charles Sanders Peirce (1839-1914). Although cohorts, de Saussure and Peirce researched independently, but saw the same thing, signs, as central in their studies (Crow, 2003).

In semiotics, there are three main areas: The first is the sign itself. The second is the way signs are organized into systems or codes. The third is the contexts within which the signs operate, icons, indices, and symbols. Every sign refers either to *icon* through similarity to its object, or to *index* through factual connection to its object, or to *symbol* through interpretive habit or norm of reference to its object (Fiske, 1990; Crow, 2003). This aspect is about communication: someone sends a message to someone else. The sender sends the message or sign. and that is received by the receiver. Every sign is interpreted either as (rheme) term-like, standing for its object with respect to quality, or as (dicisign) proposition-like, standing for its object with respect to fact, or as (argument) argumentative, standing for its object with respect to habit or law. This is the trichotomy of all signs as building blocks of inference.

In the design aspect of semiotics, different understandings of a design can result from different points of view such as the designer, the user, the producer or even a bigger group, a larger cultural community or society. The reason for those differing views is to avoid to misjudgements or ‘the god’s eye view’, to make overly broad generalizations (Vihma, 2010).

We see that semiotics is a way to study signs. Susann Vihma continues the discussion of semiotics, stating that semiotics is about ‘meaning formation, signification and communication’ (Vihma, 2010). *Sign* has been approached by several researches as an umbrella term. In the terms of Ferdinand de Sausssure, a sign is produced when a ‘Signifier’ and a ‘Signified’ are brought together (Crow, 2003). Another term of semiotics comes from Charles Sanders Peirce, who stated that a sign refers to something but not itself, and that is the *object*; the object will be *understood* by someone, and then there is an *effect* in the mind of the user, or *interpretant*, who reads or comprehends the sign. These three elements – sign, object and interpretant – form a triangle system and are quite closely related (Fiske, 1990). According to those two statements, the concepts of Ferdinand de Sausssure and Charles Sanders Peirce are both very similar. Sausssure’s *signifier* is similar to Peirce’s *sign*, which refers to something, and Sausssure’s *signified* shares its explanation closely with Peirce’s *interpretant* (Crow, 2003). Analysis in this thesis is based on Ferdinand de Sausssure’s orientation.

From the sections above, we know that the concept of sign has been essential in both the Saussurean and the Peircean approach to communication in the field of semiotics.

A sign can represent something, but this does not mean that a sign only has a single

meaning behind it. The meaning depends on the reader's experience (Crow, 2003), or as Vihma puts it, 'a sign is not a thing, but a theory about relations' (Vihma, 2010). An object can be a sign. For instance, a door can be a sign to indicate entering, so that could become an icon, index or symbol (Vihma, 2010). Therefore an object can 'signified' different by different 'signifiers'.

Additionally, a product can communicate a sign to users by itself. A product's material tells meaning by itself; the form and colour of material of a product give a meaning. A product may sometimes be called a sign vehicle, when it functions as a sign and incorporates reference relations; then the sign will be clearly constructed. The relationship between a sign and a reference relations is the point that researchers address in analysis (Vihma, 2010). In other words, people communicate with others through products, and products show personal definitions in social groups, to signify a place for ourselves in the social community. From that we can say, 'design is a sign of the times' (Bu̇rdek, 2005).

Susann Vihma explains that 'The semiotic sign – as iconic, indexical, and symbolic modes' (Vihma, 2010) can be interpreted in terms of what a product's function is and how it connotes meaning. Hence, sign has ability to offer 'a platform that is versatile enough for the task' (Vihma, 2010). Through analysis, it is possible to find meaning through the appearance of products, from the point of view of semiotics.

In the book *The Meaning of Things*, Mihaly Csikszentmihalyi and Eugene Rochberg-Halton mention that objects show users' intentions. This is the sort of message that is sent by things in and of themselves. Meanwhile, people also can learn things about our relationship to those objects, just like we learn things from

relating to other people (Rochberg-Halton, 1981).

In a specialized field such as emotional design, even analysing a product has its own characteristics, which you can find in different versions. The author mapped the three levels of product characteristics below:

- Visceral design ‘is about the initial impact of product, about its appearance, touch, and feel’.
- Behavioural design ‘is about use, about experience with a product’.
- Reflective design is about the ‘feeling, emotions, and cognition’ (Norman, 2004).

Among of the levels above, time is quite a different distinction element. The visceral and behavioural levels are more related to ‘now’ because you can feel, see, touch and use the product in the present. The reflective level requires some time to reflect on experiences from past and to contemplate the future (Norman, 2004). Even so, a product design cannot satisfy everyone, but it can have its own unique advantages to pander to a specific group of consumers.

In addition, Mihaly Csikszentmihalyi and Eugene Rochberg-Halton mentioned that when something holds meaning for someone, that can explained between a thing and person by having a connection in past experience. Hence, Csikszentmihalyi and Rochberg-Halton say, ‘the emotion that thing evoke is also an interpretation or inference, a sign or symbol of one’s attitude’ (Rochberg-Halton, 1981).

From the theory above, objects contain messages or signs, and most symbols can communicate with human behaviour. Thus in my study, semiotics is a reasonable

approach to the thesis. Moreover, it is quite ‘precisely, the scholarly study of signification and communication, focusing on the interpretation of signs and symbols as they operate in various fields’ (Karjalainen, 2004).

Semiotics is ‘referring to symbolic aspects, serving to convey meaning’ When semiotics is applied to design, the theories of semiotics turn ‘the meaning of artifacts’ into ‘the relations between sign and their referents.’ The word *semiotics* can be seen in terms of its prefix (‘semi’ = ‘half’), which has roots in the Greek ‘sema’, and that is a sign that indicates something has half relationship, which in this case is between signs and something else (Krippendorff, 2006: 35, 209, 210). In semiotic analysis, there are three modes: iconic, indexical and symbolic. Any of these modes can give reference to a product. That is also why ‘a product as a sign’ (Vihma, 2010).

For my study cases’ products, I am using the viewpoints of Alvise Mattozzi. Mattozzi presents a semiotical tool to analyse a single product, the squeezer Juicy Salif, which was designed by Philippe Starck. Alvise Mattozzi says, ‘Objects are articulated’ (Mattozzi, 2010) because an object is an actor. It exists when it functions in action; whatever something is or something is a part of practices processes.

Moreover, Alvise Mattozzi’s interpretation tool can be used to define what an object signifies. Semiotics can be used as a methodology to express the result, and that will accord a certain sense, descriptive concepts, categories and models. Additionally, Alvise Mattozzi mentions that semiotics cannot be an epistemology or any conceivable theory either, but that semiotics still deeply affects theory and

epistemology. A way of expressing semiotics is to see it more closely to cartography; it presents the outcome as categories and models. The definition of cartography is the science or art of making or drawing maps; in other words, it is a tool to operate descriptions in a practiced way. For example, maps are predisposed to a practice, which is traveling. Hence the relation between semiotics and design should be thinking about the practice which communicates ‘produce and use descriptive tools that affect design practice’ (Mattozzi, 2010).

Alvuse Mattozzi’s method of semiotical analysis is divided in three levels, starting on the level of products interacting with each other and continuing into the intra-objectual level of a single product’s outer and visible formation.

The first level on the bottom is inter-objective relations: at this level objects manifest themselves taking part in a series of interrelated actions with other objects, that is, other products or other elements concerning the environment of a product.

The second level is inter-objectual relations: this describes relations that predispose inter-objective relations. These are inscribed into the object. For instance, a keyhole predisposes a relation with a certain key and a hammer predisposes a relation with a hand and a nail. Additionally, syntagmatic inter-objectual relations are, indeed, relations inscribed into a certain object that predispose it to interact with other actors (human or non-human) that are co-present within a certain situation. Moreover, syntagmatic inter-objectual relations outline a network that allows the object to carry out its narrative program. The narrative approach, i.e. a ‘story telling’ way of using language, is something new that Matozzi’s method brings into design and product semiotics. Without the narratives of products, we can say the analysis is just

semantics. The language, words and ‘stories’ bring design semantics into the semiotics.

The third level on the top is intra-objectual relations: this describes relations among parts of object that are internal, constituting and predisposed to be singular. The parts can be considered in different ways:

- As plastic parts, constituted as networks of contrasting plastic traits related to shapes, colors, properties of materials (consistency, texture). The plastic level consists of relation between shapes, colors and their topological distribution.
- As bodies, wherein each plastic part outlines a body in interaction with other bodies outlined by other plastic parts.
- As figures, since parts that are recognizable on the basis of a specific plastic configuration and in relation to that are nameable as that. The figurative level consists of relations between recognizable objects of the world according to certain cultural grids.

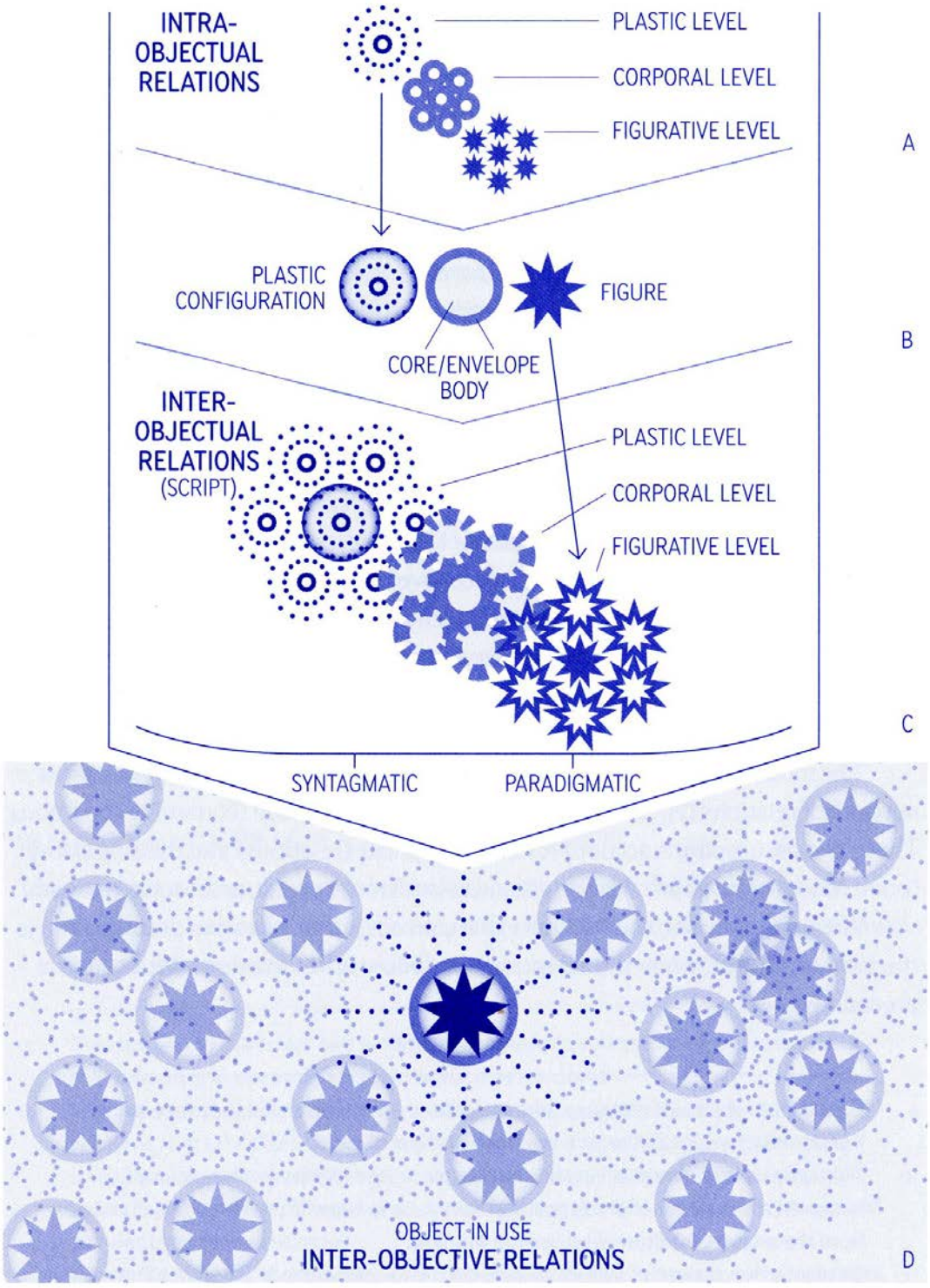

Image 1: Mattozzi: Semiotic analysis of objects: A model (Mattozzi 2010)

Objectual and objective relations pertain to different domains, or different spaces, in a similar way as a painting pertains to a domain

> different form the one of the wall upon which it hangs. In more adequate semiotic terms, objectual and objective relations pertain to two different ’enunciation layers’, i.e. two different frames of reference (Mattozzi, 2010: 52).

The word ‘enunciation’ is defined as meaning, simply said, from what viewpoint or by whom something is said. Applied to design, it means many times in different contexts that products are ‘taken’.

In addition, between intra- and inter-objectual relations, there is a stage that accounts for the object as a singularity, such as:

1. In relation to its plastic configuration: shape together with other perceptual features such as colour, consistency, etc.
2. In relation to its body: According to Jacques Fontanille (2004) a body articulated in a core and an envelope. The core, maintains the property of actant, and the definition of actant is in narrative theory, it is a term from actantial model of semiotic analysis of narratives. It relates to transformations: actions, what a certain body does. The envelope is an interface between the core and other bodies. It manages the relations between the inside and the outside of the body, within transformations carried out by the core. Therefore the envelope is related to how a certain body accomplishes what the core predisposes.
3. In relation to its figure: recognizable and usually nameable, an object as a singularity predisposes articulation of other, external, relations (Mattozzi, 2010).

Professor of design semiotics Susann Vihma referred to the ‘choices users make

regarding design alternative; preferences can be explicated and inspired' (Vihma, 2007: 229). Semiotic analysis can support the idea that the users and producers skip mistakes, which is unawareness of the relation of the meaning form. 'Thus they contribute to the planning of a product environment in which people want to live.' (Vihma, 2007: 229)

2.2 Semiotic analysis of objects

Through the Freitag messenger bag

Image 2: The Freitag messenger bag with user

Intra-objectual relations

Here I will follow Alvuse Mattozzi's method of semiotics analysis, intra-objectual relations: describe relations among parts of object that are internal, constituting, predisposing to be a singularity. Hence the Freitag messenger bag includes various plastic contrasts:

- Shapes: firm lines, asymmetrical colours section, quasi-rectangular horizontal

section;

- Textures: smooth, plasticity;
- Position: down / side.

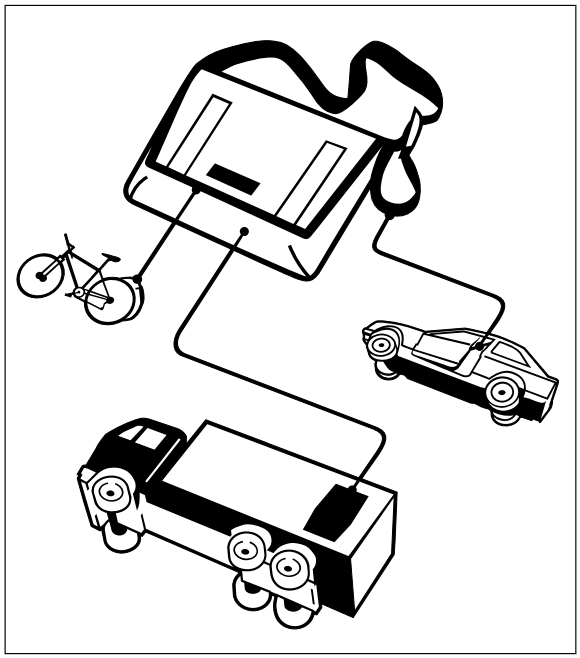

Image 3: The concept of Freitag

The Freitag messenger bag is composed of an old truck tarpaulin, second-hand car seat-belt webbing and an old bicycle inner tube. From Image 3: the concept of Freitag, this shows how the materials are used on the Freitag messenger bag and the relation between the bag and the materials. Examination of the bag reveals that cutting of a part of an old truck tarpaulin is most important element of the product. This accounts for almost 95 percentage of all the elements. Additionally, the material of cutting a part from an old truck tarpaulin is also responsible for visual effect, hence the pattern of cutting a part of an old truck tarpaulin will be a key point for the aesthetic wholeness. Because the material piece is taken from cutting a part of an old truck tarpaulin, each bags has a different surface. Hence, Freitag

messenger bags have unique features, as people have unique personalities. This shows the bags' characteristics, and the people who buy the bag also express uniqueness. Therefore, this is one of the signs of the product.

Inter-objectual relations

In the method of Alvuse Mattozzi's semiotics analysis, this level describes relations that predispose inter-objective relations. They are inscribed into an object. Therefore, from Image 3: the concept of Freitag, the Freitag messenger bag is compose of an old truck tarpaulin, second-hand car seat-belt webbing and an old bicycle inner tube, so all the materials are recycled; this makes it easy to think about the relation with protecting the environment. Even without seeing Image 3, people can still understand that the bag is made from 95% recycled material.

Inter-objective relations

As I described before, Alvuse Mattozzi's model asserts that at this level objects manifest themselves in taking part in a series of interrelated actions. Thus, as seen from the Freitag messenger bag's surface, the bag is made from an old truck tarpaulin. The first image is that the bag is durable, because the material is quite heavy-duty and also waterproof. Thus, customers do not feel guilty when they just lay it down on the floor or drop it on the lawn etc. because those actions give the bag more character. The characters could be described as informal, casual, and free and easy.

Conclusions

Through analysing the Freitag messenger bag above, we see that the characteristics of the Freitag messenger bag include uniqueness, casual, improving the

environment and so on. Accordingly, when we see the people on the street who carry the Freitag messenger bag, we may then reflect those characteristics onto that person. By the same logic, the Freitag messenger bag will attract people who have the same personality or who want to have the same personality as the product itself. These people will want to purchase the product; from the point above, it is individual cultural spiritual liberty and social equality from Findeli's three spheres of sustainability because Freitag messenger bag shows personal personality, which can be individual cultural spiritual liberty. The customer freely purchases his or her own style of Freitag messenger bag, and that is social equality. Finally, Freitag company procurement used truck tarpaulins from different European express transport trucks, which is economic solidarity.

Through the computer screens light from Klinik der Dinge

Image 4: Transferred computer screens into a light. (Klinik der Dinge, 2010)

Intra-objectual relations

The computer screens light, also via Alvuse Mattozzi's semiotics analysis, in intra-objectual relations contains the various plastic contrasts listed below:

- Shapes: firm, cube, single-colour section, quasi-square horizontal section;
- Textures: smooth, plasticity, light, hard;
- Position: down / side.

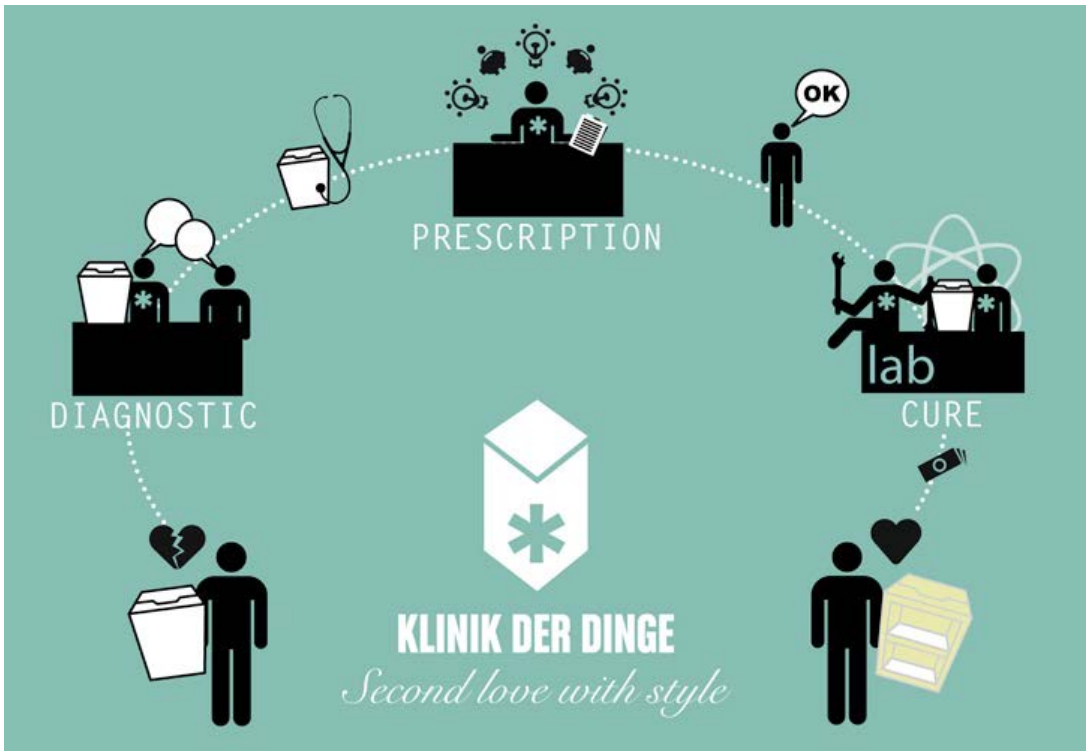

Image 5: The concept of Klinik der Dinge (Klinik der Dinge, 2010)

The computer screens light is composed of computer screens. From Image 5: the concept of Klinik der Dinge shows how the Klinik der Dinge redesigns products from old and sick objects. Through Image 5: The concept of Klinik der Dinge, it can be found that the designer treats old and sick objects as patients. They treasure goods whether they are in good or broken condition. And the customers who bring old and broken objects should have an equivalent awareness.

According the process of Image 5: The concept of Klinik der Dinge, the consumer brings a broken object with their broken heart to the Klinik der Dinge (the clinic of things), and the designer will check it and then give the diagnosis and prescription, with agreement by the owner. Thus, the designer can cure the old and sick object so that it becomes a new product in a new function for the owner. Afterward, the owner still can use the object with happiness. Hence, Image 5 shows us that they not only

cure broken objects but also cure the owner's broken heart. That is why Klinik der Dinge says second love with style. I think this is a very humanistic approach to redesign thought.

Inter-objectual relations

From Image 4: Computer screens light was composed from two computer screens' envelopes, and that became one lampshade. When it turns on in the dark, people cannot easily recognize that it is made from two computer screens. I sent the image to a few friends of mine to let them guess what the light was made from. No one guessed right; I was quite surprised by the result. After I explained that the light is made from old computer screens, people found that to be a very creative product.

Inter-objective relations

Based on my non-scientific survey, it appears that the computer screens light just functions as a general light, and it is not so easy to recognize what useless object it was made from. Additionally, the appearance of the light is not symmetrical, because it is made from two different-shaped computer screens' envelopes, and that looks more contemporary in style. Hence, the old style computer screen can create a contemporarily designed product, and I am sure that will be very rigid, as we know that old style computer screen envelopes are quite strong.

Conclusions

Through analysing the computer screen light above, we see that the characters of the computer screen light include uniqueness, contemporary style, firm, improving the environment and so on. Hence, from that point of view, it is individual cultural spiritual liberty in Findeli's three spheres of sustainability. Though I roughly asked

for other people's comments on the computer screens light, I think the light's owner will happy with the result of the Klinik's cure. Indeed, that is a really successful project, and it also a valuable product. Moreover, it also surprises people who do not know the computer screens light was made from useless computer screen envelopes. After they know the production process, they will like this interesting computer screen light even more. Hence as the process of the Image 5: the concept of Klinik der Dinge description shows, not only old and sick objects get the treatment, people also receive the psychological treatment such as a surprised mood or happiness. I think that is social equality in Findeli's three spheres of sustainability, because everyone can bring their own broken objects to Klinik der Dinge (the clinic of things), and every broken objects can get equally good treatment. However, economical solidarity in this case is missing, because Klinik der Dinge focuses on the local area, and most customers are single, couples or families, hence, it is quite hard to archive economical solidarity.

Over the past decades, design has often determined a product's existence. Additionally, it can be a tool to let us to communicate with other people, even to define our social groups (Bürdek, 2005).

Through the windproof jacket from Worn Again

Image 6: One of the products from Worn Again, a windproof jacket sewn from pieces of an old hot air balloon from Virgin Balloon Flights (Worn Again, 2009).

Intra-objectual relations

The Worn Again windproof jackets features:

- Shapes: soft, pieces, single colour section, irregular shape;
- Textures: smooth, plasticity, light, strong,
- Position: down / side

This windproof jacket is sewn from pieces of an old hot air balloon. The concept of

Worn Again is trying to turn wastes into products and make greater value from those recycled material, which is upcycling. Worn Again changes the traditional way of recycling the material by using these materials again and again, keeping them out of landfills. They call this process is ‘closing the loop’.

Image 7: The concept of Worn Again (Worn Again, 2009)

Because the jacket is made from an old hot air balloon, the material should be very strong, light and windproof material. Otherwise, it could not be safely rise into the sky. Therefore, they used the same material intended for other textile for the windproof jacket; it’s a perfect combination.

Inter-objectual relations

The whole jacket is composed of part of big old hot-air balloon. However, even we look at Image 6, it is still quite hard to recognize that the fabric is from an old hot-air balloon. The recycled hot air balloon is the main material for this product.

Inter-objective relations

As I mentioned before, the old hot air balloon is made of a very strong, light and windproof material. Hence, when a consumer wears the jacket, he or she will also feel how strong, light and windproof this jacket is. Besides, according to the Image 6, we can feel the girl who wears the jacket looks quite cool and feels freedom, from the photograph.

Conclusions

First, Worn again cooperates with quite famous clients, such as Virgin Balloon Flights, Eurostar, McDonald's…. They are quite successful on economical solidarity at this point. Second, through the design, Worn Again transforms the old hot air balloon into a wearable jacket, which is a unique idea, and the manner can represent individual cultural spiritual liberty. Finally, they are doing upcycling, which belongs to the sphere of social equality. Therefore, from this point of view, Worn Again matches Findeli's three spheres of sustainability: economical solidarity, individual cultural spiritual liberty, and social equality.

Through the varieties textiles products from Globe Hope

Intra-objectual relations

Basically the textile products from Globe Hope will be similar to Worn Again's windproof jackets features because both of them are doing textiles products:

- Shapes: soft, pieces, simple color section, irregular shape;
- Textures: smooth, plasticity, light, strong;
- Position: down / side.

Image 8: Globe Hope uses quite different recycled materials for making a variety of textiles products for different seasons (Globe Hope, 2010).

Inter-objectual relations

Globe Hope use quite many different materials to make a variety of textiles products, including army uniforms, vintage textiles, advertisement banners, seatbelts, worker overalls and so on. From Image 8, the girl wears a green dress that is made from army tent rain covers from East Germany. They also use same fabric to make two different styles of handbags.

Inter-objective relations

When you see this dress, it is quite hard to make the connection with army objects.

After we know that is made from an army tent rain cover, my first thought is that the dress should be very durable.

Conclusions

Basically, Globe Hope and Worn Again both are doing the upcycling of textile industrial, so the analysis will be similar. Globe Hope recycles materials not only from Finland, but also from Sweden and Germany. Hence, they meet the economical solidarity sphere. After the creative design, recycled materials transform into many lovely and special items; this can represent individual cultural spiritual liberty. Finally, as I mentioned before, doing upcycling is a kind of social equality in one of Findeli's three spheres of sustainability.

Chapter 3

REDESIGNED CONCEPTS and LIFE CYCLES

3.1 Re-designing data analysis

Stuart Walker mentioned that objects' characteristics usually have three different kinds of broad categories, which are functional, social/positional, and inspirational/ spiritual. Each of the broad categories can overlap in the same object. After the combined broad categories of the object, characteristics will tell the relationship between object and sustainability.

In relation to the combined broad categories, the most problematic in terms of sustainability is 'functional' plus 'social/ positional'. Objects of the 'functional' plus 'social/positional' combination include automobiles, watches, music equipment, footwear, and 'designer-labeled', and include products that I will describe in later redesigning products cases, such as bags and clothes.

As we know, objects of the 'functional' plus 'social/positional' combination are mass-produced products. Those products are usually promoted and distributed globally, and they also drive consumerism. Most of those products have a strong and negative effect on our environment and society. Therefore, those products not only 'combine functionality with positional value, they also become quickly outdated' (Walker, 2006). Hence, those contemporary goods have short lifespans because we know high tech goods always need to be more advanced than others, so people can follow the next great product's step and purchase new functions or new-looking products. Based on this premise, environmentally and socially are damaged by this combined category of objects (Walker, 2006).

Although the products that I mentioned above are part of the ‘functional’ plus ‘social/positional’ combination, that produces also the ‘inspirational/spiritual’ plus ‘social/positional’. Stuart Walker mentions that these characteristics of objects will not cause much problem in terms of sustainability. In contrast, production can be good for the environment and society, because products are mainly low-tech goods and generally made by hand and produced in local areas. Hence, people from the same place will pass techniques, cultural and aesthetic sensibilities from generation to generation. Meanwhile, local people benefit socially, economically and environmentally. Local actions also have relatively low impact on the environment. People today also focus on precious heritage techniques to carry on in future generations, so the description above is also a way to keep the stream flowing (Walker, 2006).

As previous stated, in this chapter, I collected a few cases of redesign companies and their products to show what a redesigned product is. Most of them require three conditions: first, the products can extend used materials’ life span. Second, transfer waste to useful material for those products. Third, it decreases the process of manufacture, reducing wasted energy.

I divide redesigning aspects into two groups. One is experimental; these are produced by the designer themselves or by just few people and cannot have high-quantity production; the scale of companies is smaller. The goal of experimental redesign is communicating concepts through a product to a customer. This kind of product can only can affect a limited number of people, because that it is not manufactured stuff and cannot be sold to a large number of customers. The

Studio Hergebruik / Re-use Studio has obvious concepts for customers and also offers workshop to people who are interested in environmental issues, but they don't development their own redesigned products for marketing; the redesigned products they offer are collected from independent designers. The other case, Klinik der Dinge, only provides services for local people and does not have a shop to sell their product; that is not their goal either. Therefore, the impact of the upcycling concept to masses is much less for these companies than for the companies that I described in the experimental cases.

Another sort of redesign is more broad-scale and also attracts some specific people. Paul Burall talks about 'customer loyalty' in his book:

> It is reasonable to assume that a customer who has been influenced to buy a product partly on its environmental performance will take such considerations into account when considering a repeat purchase. So a manufacturer hoping to sell again to that customer must make sure the environmental advantages are delivered in use and the Green message is reinforced at every opportunity (Burall, 1996).

Those companies continue to aspire to the upcycling message, and got their own factory to produce the products and their own shop to sell their products. Hence, they could solve recycling problems through producing redesigned products. These two kinds of redesign are upcycling cases. They both are redesigning products made from recycled object, but the value is higher than the object, which has not been recycled before. Hence, the process of redesigning upgrades the recycled object's value. Therefore, it could be a modern trend of recycling towards solution.

3.2 The experimental of re-designing

3.2.1 Studio Hergebruik / Re-use Studio

Image 9: The Studio Hergebruik / Re-use Studio and shop in Rotterdam, Holland. (Kati Noordhuizen)

Another example is Studio Hergebruik / Re-use Studio, which is located in Rotterdam, Holland. The studio displays many objects of art and design and all focus on re-use and recycling of materials or concepts. ‘Numerous functions are combined. Besides premises for a shop, galleries and conferences, workspaces for educational activities have also been designed’ (The Studio Hergebruik / Re-use Studio, 2010). When I went to the shop I felt as though I were in any general retail design store; the atmosphere is stylish and the products are high-quality. It’s a pleasure to spend time there, discovering the products that they had transformed from old things to perfectly redesigned products.

3.2.2 Klinik der Dinge (The Clinic of Things)

Klinik der Dinge was started by two Berlin designers, Corinna Harl and Virginie Gailing. The purpose of Klinik der Dinge is just what their name implies; it is a clinic of things. They help local people cure their broken or useless objects, making new and functional products, giving a new life to old products. From their point of view, they wonder why other designers do not share their design experience with people (Grant Gibson, 2010).

Hence, Klinik der Dinge functions as a design service, only servicing the people in Berlin's Kreuzberg district. Corinna Harl said, 'the idea of local service doesn't necessarily mean closing yourself off from other. Instead, connect you share your knowledge, you pay others for their knowledge, and you create a business which produces not too much, just what people need' (Grant Gibson, 2010). For the reason above, Klinik established the clinic for local services because in their thinking, proving the skills from different professionals designers or making cures for unused objects can help people more. The *Craft* magazine describes it as,

> The Klinik could be seen as a craft intervention; not only is it about re-imagining mass produced objects through craft techniques, but it also aims to equip others with the hand-skills to let them re-imagine objects themselves (Grant Gibson, 2010).

Image 5: The concept of Klinik der Dinge, and Image 3: The concept of FREITAG, narrative life cycles. Klaus Krippendorff has stated,

> This circle is completed when designers have learned from how the artifact they had envisioned passed through its life cycle, improving the

> designers' ability to handle their ideas next time around. We could also start this examination with a product that left an assembly line, changing its role to merchandise sold for profit, to a tool used for fun, to something to be repaired by an expert, to something being disassembled for recycling valuable parts, to being a stepping-stone to a next model. The traditional emphasis on production and consumption can be seen to be a small section of that circle, which when cut into small pieces ignores the essential circularity of an artifact's life (Krippendorff, 2006).

Here is one of cured objects as an example; the process and picture below is how Klinik der Dinge cures 'old' and 'sick' objects to become a newly functional product..

- Old object: computer screens
- Cure: detox, transplant, enlightning, skin renewal
- New function: light

(Klinik der Dinge, 2010).

The pursuit of upcycled design products innovation is an everlasting endeavour in a sustainable design environment. 'Klinik der Dinge (The Clinic of Things) is a collective challenging the role and future of design in local communities, promoting emerging consumption values for a sustainable future' (Klinik der Dinge, 2010).

3.3 The successful companies of re-designing

3.3.1 FREITAG

Freitag's messenger bag was design by two Swiss graphic designer brothers, Markus and Daniel Freitag, in 1993. In the beginning, they were looking for a bag that is functional, waterproof and heavy-duty to protect their designs. However, they could not find one, so they decide to make their own. The inspiration for the truck tarpaulin came because they were living opposite the cross-Zurich highway, and because the material is extremely resistant to heat, cold and tearing (Müller, 2001). They cut a part from an old truck tarpaulin for the messenger bag, and used second-hand car's seat-belt webbing for the carry belt and sewed an old bicycle inner tube on to cover the edging.

Markus and Daniel Freitag took their surname for the brand, and it's become a successful business. I think the bags could be so popular not only because they symbolize reclamation for saving environment, but also every bag is also different from every other one. Every series of bags from Freitag has been exquisitely designed, and each used tarp could have different 'marks', making each bags more unique. Moreover, Freitag emphasizes human-to-human transmission. All the processes of production are by hand, and the photos of these processes are shown on their website. Every bag has a certificate, so the purchaser knows the bag producer's name and even know what they look like from the certificate card. That is very human-interest oriented.

Image 10: The FREITAG messenger bag is cut from a piece of old truck tarpaulin.

The book *Freitag: individual recycled freeway bags* mentions that Freitag knows that the material that they reuse now is actually not eco-friendly for environment.

> In secret, the Freitags hope that PVC will eventually be banned. Then there could be a worldwide hunt for truck hides that would go on until they become extinct. After the last truck trap was made into a bag, the brothers could retire (Müller, 2001).

In reality, they are solving a problem of old truck tarpaulin waste. The company was founded November 14, 1995, and in 2000, they started the web shop so that customers living outside of European countries can also view or order a bag from the internet.

From the data above, we could image how many piece of old truck tarpaulin have been used during the past sixteen years. On the other hand, there can be an impact on the environment when they wash those old truck tarpaulins. My argument for this point follows the thinking of Paul Burall, who has described the environmental impact from the washing machine in the book *Product development and the environment*. He mentioned the lifecycle analysis for a washing machine, as given by PA Consulting, as part of the preparatory work for the European Community's Ecolabel scheme; the analysis divided the life of a washing machine into four stage, which are production, distribution, use and disposal. Each stage was tested for its impact on the environment. The effects can be energy consumption, air pollution, water pollution, solid waste and water consumption. Moreover, a huge proportion of the impact is not from the manufacture or disposal but from use stage of the washing machine's life (Burall, 1996). This problem might come into public focus, and that will be a task for the company.

Image 11: the XXXL washing machines for washing old truck tarpaulin

From what has been stated above, Freitag's messenger bag is still quite successful in the upcycling business. We can see Freitag shops in Europe, but they also have marketing in Asia, North America, and New Zealand. In 2010, Freitag cooperated with football brand Pelé Sports to design a unique Freitag football for young South African footballers. Freitag always have new ideas for their creations and a clear and strong concept about how they upcycle old objects; however, some customers may purchase without considering those reasons. For instance, one of Freitag bag owner was asked in an interview, 'Did he buy the cause that help saving the world through the recycling?' The answer is 'No.' He bought the bag because of the size of the bag, visual design and also the personality. Even so, there will be more and more people who know them and also understand what are they doing whatever the product or project they are working on. Hence, in this case of redesign, design and

marketing skill really help Freitag to promote the value of the product. The product is very popular with many people.

3.3.2 Worn Again

Worn Again started in 1995 in UK. Cyndi Rhoades is the founder of Worn Again. They provide creative ideas of sustainable solutions to large businesses, such as Eurostar and Virgin Balloon Flights. In this case, they cooperated with Eurostar and Virgin Balloon Flights; their main work is helping companies to reduce waste. They use decommissioned uniforms and retired hot air balloons as the materials to redesign new bags, windproof jackets and other accessories. Additionally, they also do business directly with the consumer market. Therefore, Worn Again helps huge groups identify with the concept of upcycling and face the concept of impacting the environment. Alex Ferguson, head of communications and marketing at Virgin Balloon Flights, said, ‘We recognize the importance of making our business as sustainable as possible and, by creating these fantastic, desirable products from our waste with Worn Again; we’ve taken a practical step towards this goal.’ Louisa Bell, head of environment and energy at Eurostar, said, ‘We’re delighted to be working with Worn Again as they give new life to Eurostar uniforms. It’s all part of Tread Lightly – Eurostar’s plan to reduce our impact on the environment and to help consumers do the same.’ In this mode of cooperation everyone becomes more powerful (Worn Again, 1995).

Those actions are just the beginning; the next step is delivering the concept of recycling everywhere in the world. From businesses' point of view cooperation with Worn Again has benefits for themselves, not only solving part of the waste problem from cooperating companies, but also promoting the companies from with those new redesigned products. John Doerr said, 'Companies are really powerful, and that matters a lot' (Doerr, 2007). Hence, the concept of Worn Again could even communicate to a larger number of people, including recycling material providers and buyers through cooperating with those companies. Besides the material collection, the cooperative partners and the products Worn Again company redesigned are quite diverse; therefore, they can generate more kinds of products on the market.

Nevertheless, Worn Again also has problems from production processes, like Freitag. The Chinese version of the BBC news website includes reports that are negative about Worn Again. It mentions that Worn Again cooperates with Terra Plana to redesign shoes from the local recycling materials in UK, but manufactures them in faraway China. This means that they need to send the materials to China to produce the shoes, and then send it back to Britain. This not only causes the pollution of transportation and wastes energy, but also pollutes the environment at the shoe factory in the Guangdong region of China (BBC News, 2007).

However, in the same year 2007, Worn Again shifted production from China to Portugal, but since Worn Again's launch producing footwear in the Guangdong region in 2005, 80% of footwear manufacturers also launched in China and other countries around the world. Hence, as the reported by BBC news above, the problems of production deserve serious consideration.

3.3.3 Globe Hope

Finnish design company Globe Hope is an innovative ecological design out of recycled materials. It was established in 2001 by Seija Lukkala. She tries to change the fast-paced ways of the textile industry by using sustainable, ecological actions to produce textile products. In the textile industry there is always a need to follow seasons and trends, so textile products will use more raw materials, energy and so on. In addition, most fabrics are not even planned for long-lasting value; people are going throw it away.

Based on this premise, Seija Lukkala used her expertise to create Globe Hope to redefine old fabrics and for people who are interested in the same ecological way of thinking. Most of Globe Hope‘s products are designed, produced and storaged in Finland. They also have some textiles produced in Estonia; they chose a location that is still very close to Finland because they want to keep the footprint as low as possible. (Globe Hope, 2010)

Globe Hope are using quite a variety of recycled materials including are hospital and army textiles, worker uniforms, advertisement banners and flags, recycled sails, seatbelts and vintage home textiles such as curtains, tablecloths and bed sheets. From that variety of materials, they make different kind of textile products. Moreover, the designs get a theme for each season. Hence, customers always have a

new collection to see from Globe Hope.

When old fabrics have been designed into a redesigned product, the Finnish may say, ‘Oh, the fabric of that skirt is the same as my old curtain.’ So the old curtain used to hang on a window and just look at people passing by, but now it becomes a skirt and walks on the street with its new owner to meet new friends. Globe Hope’s designer Anna Huoviala says that German customers especially like the redefined fabric from Finnish army uniforms, because they can experience the exotic style; Japanese customers prefer the fabric’s pattern, texture and aesthetics (Tu Tsui Shan, 2007).

When you browse Globe Hope’s catalogue, you can find redefined fabrics telling their own stories in the catalogue. A good example of this is one skirt that says, ‘I have been living with the old lady in the cottage for many years. She was very kind to me and treasured our company. She was proud of me when she got together with her own friends. She always took care me and never drops the coffee on me. One day, I was redefined as a skirt, and now I could look around and know what is happening in other places. Hence, I have so many stories can tell. I hope can find someone willing to listen to my story’ (Tu Tsui Shan, 2007). It really touched my heart when I read the article; I think customers do not just buy the product, they also get the story, the memory and the emotion through purchased the products. The customer then becomes a part of the story, the memory and the emotion of the product.

In summer 2010, Globe Hope purchased another company, SECCO, which also has a similar concept. After that, the products of Globe Hope were no longer limited to soft materials in the textile industrial but also include hard materials, like computer

circuit boards, unplayable LP-records and rubber from car tires. So far most of products are as the same as SECCO sold before. There are no new designs yet.

Freitag, Worn Again and Globe Hope also sell their products in other countries besides Finland, but most sales are in European countries with a few in the Asian countries such as Japan.

3.4 Same meaning but different means

After studying those studios and companies that put a lot of effort into working with recycled items to create useful products. I simply analyse them using two methods to attract people: ‘memory’ and ‘trend’.

The experimental redesigning group, when they create a new redesigned item, basically does not change the appearance, even if the function totally changed. Hence, new redesigned items can tell a story this way. For instance, Klinik der Dinge transformed an old computer screen into a light. That kind of computer screen was very popular in the past decades, but people today are buying LCD monitors, so old computer screens are becoming history. Hence, Klinik der Dinge transformed an old computer screen into a light as a good way to keep the item and its ‘memory’. This can preserve someone’s fond memories of a first computer that may have been given by their family members or friends, or it could be the memory of someone worked hard to earn the money for a first computer, and the memory of using old computer screens.

Another method of attracting people to buy the redesigned product is ‘trend’, which I realize from the successful re-designing companies can have a massive impact.

From my point of view, these are successful re-designing companies; for example, Freitag is a fancy brand for many people, and it can be a fashion trend for those people. Although the bag is made from recycled material, one bag can still can sell for a few hundred euro. As I mentioned earlier, a Freitag bag owner said that he did not buy the bag to help save the world through the recycling, so some customers will buy the bag just to show personal style and follow trends.

According to the analysis, it is still hard to determine which way is more correct to do the redesigning, but both methods are effective in helping people take note of environmental issues, and there will be more people joining. The most interesting thing is that three companies – Freitag, Worn Again and Globe Hope –can all match Findeli's three spheres of sustainability: economical solidarity, individual cultural spiritual liberty, and social equality. In the case of Klinik der Dinge case, only the spheres of individual cultural spiritual liberty and social equality are fulfilled. They do not have economical solidarity, and I think that is why Klinik der Dinge focuses on local groups, while Freitag, Worn Again and Globe Hope focus on worldwide marketing.

Chapter 4

CONCLUSIONS AND DISCUSSION

4.1 Review of research findings

Toni-Matti Karjalainen has stated:

> The visible forms, colors and textures of material objects and artifacts have symbolic properties and function as visual signs. Industrial designer encode products with particular design features, visual cues that are hoped to evoke specific associations and to give products a particular character, to create a brand image (Karjalainen, 2004).

From the point of view above, it is also understandable why people are usually interested in the ‘symbolic value’ of products. For instance, the windproof jacket made from used hot-air balloon lets us think about freedom; when you wear that jacket, you can go anywhere, just like a hot-air balloon. The author of *Product Development and Environment* mentioned the Austrian psychologist Leonhard Oberascher speaking at the Nunsppeet Design for the Environment Conference in the Netherlands in 1992, where Dr. Oberascher suggested:

> A general tendency of today is that the functional value or usefulness of product becomes gradually less important to the consumer. He seldom buys a product only because of its functionality or price but because of its symbolic value. By purchasing a product he acquires a piece of image, hoping that the product’s aura will also throw some light on his personality. Hence industrial products more and more fulfil the role of cultural symbols (Burall, 1996).

The basis of the theory above returns to the signs of semiotics, which are discussed in Chapter two. American philosopher Charles Sanders Peirce labelled the features of the three categories of signs (icon, index and symbol) as firstness, secondness and thirdness. *Firstness* is a sense of something, and it can be a feeling or a mood. *Secondness* is a physical relation to something to tell a fact to another. *Thirdness* is the mental level of general rules, and that can bring things into a relationship (Crow, 2003). Therefore, the features of firstness, secondness and thirdness can demonstrate the relationship between object and signs, and signs will be a key level for the object.

By the same logic, Ann Thorpe says, 'Novel or expensive consumer goods gain us a certain position in society, a position lost without relentless striving' (Thorpe, 2010). If redesigning creates a product with valuable signs, that is an advantage over mass-produced. I wish to bring the message of recycling but not downcycling through my thesis because reprocessed products made from recyclable materials will be an essential part of our daily lives in the future.

After analysing the examples shown in Chapters 2 and 3, using semiotics to tell the relationship between signs and redesigned used objects, I strongly feel that upcycling design is putting the original item's sign into the redesigned items to create an item's new story or characters. That is why I said that the windproof jacket made from used hot-air balloons lets us think about freedom; when you wear that jacket, you can go anywhere, just like a hot-air balloon. The same logic can also apply to other redesigned product. Whereas, when products are made from raw materials, there is no story to tell.

This thesis gives examples of people being able to enjoy products until the end of the product's lifetime and designers trying to design the products to be 'cradle to cradle not cradle to grave', because 'The best way to reduce any environmental impact is not to recycle more, but to produce and dispose of less' (Braungart, 2002). That will be one trend going forward in the product design field.

4.2 Implications/Applications of the study

Since I have been studying in Finland since the summer of 2008, I have learned that people living in Europe buy things in second-hand shops or flea markets, so I have adopted the practice of these European countries, such as Finland, Sweden, France and Holland. In Taiwan, people were not used to buying things that someone else has already used; there was little information available about second-hand shops or flea markets. Most old things we donated to institutions. Hence, I cannot even find redesigned products or innovative ecological designs in Taiwan as I did the research for the previous chapter.

However, news from Taiwan has taken notice of an increase in second-hand shops recently; some people beginning to buy things from second-hand shops or flea markets. This means some people are willing to use items that are not new, from second-hand shops or flea markets. That will provide a good start for redesign marketing for Taiwan because repeated reuse or redesigning objects will be a trend for many decades; although we never know for certain what will happen in the future, it's quite possible that this point of view will become a general attitude. Furthermore, more and more people could adopt eco-thinking because of those eco companies' acts and because of natural and man-made disasters. Especially, 'the western world has 20 percent of world's population but use 80 percent of world's

material and energy resources' (Burall., 1996); someone born into a convenient life environment may not want to take action, but everyone has the responsibility to take action.

In my personal point of view, people who create or purchase redesigned objects are the ones who really consider environmental issues. These more people are taking action with respect to conserving and preserving the environment, energy, resources and so on.

Finally, I hope that I can bring information about upcycling to my further career in Taiwan, or wherever I am, and I will always pay attention to that kind of information and to redesigning products to enhance my vision of redesigning.

4.3 Limitations of the study

A famous American industrial designer, Henry Dreyfuss, says, 'If the point of contact between the product and the people becomes a point of friction, then the Industrial Designer has failed. If, on the other hand, people are made safer, more comfortable, more eager to purchase, more efficient – or just plain happier – the designer has succeeded' (Papanek, 1992). The cases that I examined in the previous chapter, based on this definition of success, were quite successful companies that satisfy their group of customers and also resolve part of the material recycling problem.

In my opinion, designers who are redesigning products get more of a challenge than general designers because of the limits imposed by the recycle material. They are not just creating products; at the same time; they are making a story for the product

itself. When consumers receive redesigned products, they may think about the background story of those products.

Furthermore, as the environment changes rapidly, in the future, there will be more limits on resources for designers around the world. How can we reclaim limited resources? This remains an important issue. From the article *The Truth about Recycling:*

> If done right, there is no doubt that recycling saves energy and raw materials, and reduces pollution. But as well as trying to recycle more, it is also important to try to recycle better. As technologies and materials evolve, there is room for improvement and cause for optimism.

In the article, Ms Krebs even says, ‘Waste is really a design flaw’(The Economist, 2007).

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References

AGAIN, W. (1995). <http://www.wornagain.co.uk/> [Accessed February 15, 2011]

Aguirre, D. (2010). Design for Repurposing - A sustainable design strategy for product life and beyond. Vancouver, Emily Carr University of Art + Design

Boontje, T. <http://www.tordboontje.com> [Accessed February 10, 2009]

Braungart, W. M. a. M. (2002). Cradle to cradle: remaking the way make things.

Burall., P. (1996). Product development and the environment.

Bürdek, B. E. (2005). Design: history, theory, and practice of product desig.

Cheyney, D. (2009). Green is the new black. SixDegrees. Helsinki: 14-16.

Copley, P. (2000). Routledge Critical Dictionary of Semiotics and Linguistics

Crow, D. (2003). Visible signs.

Dewey,J. (1934).Art as Experience.

Dinge, K. d. (2010). Klinik der Dinge (The Clinic of Things) <http://www.klinikderdinge.de/> [Accessed March 23, 2011]

Doerr, J. (2007). John Doerr sees salvation and profit in greentech. <http://www.ted.com/talks/john_doerr_sees_salvation_and_profit_in_greentech.html > [Accessed May, 2009]

The Economist print edition. (2007). The truth about recycling. <http://www.economist.com/node/9249262?story_id=9249262> [Accessed Nov 29th 2010]

Edwards, A. R. (2005). Sustainability Revolution: Portrait of a Paradigm Shift.

Findeli, A. (2008). "Sustainable Design: A Critique of the Current Tripolar Model " The Design Journal 11(3): 301-322.

Fiske, J. (1990). Introduction to communication studies.

Freinkel, S. (2011). Plastic: Too Good to Throw Away. NYTimes.com. <http://www.nytimes.com/2011/03/18/opinion/18freinkel.html?_r=3&emc=tnt&tntemail1=y> [Accessed March 17, 2011]

Fuad-Luke, A. (2002). The eco-design handbook: a complete sourcebook for the home and office. London, Thames & Hudson.

Gardiner, B. (2010). Upcycling Evolves From Recycling. NYTimes.com.< http://www.nytimes.com/2010/11/04/business/energy-environment/04iht-rbogup.html?pagewanted=1&_r=2> [Accessed November 30, 2010]

Gibson, G. (2010). Upcycling clinical trials. CRAFTS 40-43.

The Environmental Protection Encouragement Agency (EPEA) (1987). Michael Braungart <http://epea-hamburg.org/index.php?id=69> [Accessed January 15, 2011]

Hendrickson, N. C.-S., Lester Lave and Francis McMichae Introduction to Green Design. <http://www.ce.cmu.edu/GreenDesign/gd/education/gdedintro.pdf> [Accessed April 17, 2011]

HOPE, G. (2001). <http://www.globehope.com/en/> [Accessed March 10, 2011]

Jansz., P. C. a. L. (1998). Introducing semiotics.

Karjalainen, T.-M. (2004). Semantic transformation in design : communicating strategic brand identity through product design references.

Krippendorff, K. (2006). The semantic turn: a new foundation for design.

Manu, A. (1994). "The humane Village Explained." The humane Village 1(1): 11.

Mattozzi, A. (2010). SEMIOTIC ANALYSISI OF OBJECTS: A MODEL.

McDermott, C. (2007). "Design The Key Concepts." 45,193.

McDonough, W. (2005). William McDonough on cradle to cradle design.

METAMORPHOSE, METAMORPHOSE project. <http://www.meta-morphose.ca/flash_eng/meta_movie.mov> [Accessed September 26, 2010]

Michael Braungarta, W. M. a. A. B. (2007). "Cradle-to-cradle design: creating healthy emissions – a strategy for eco-effective product and system design." Journal of Cleaner Production 15(13-14): 1337-1348.

Müller, L. (2001). Freitag : individual recycled freeway bags, Lars Müller.

Norman, D. A. (2004). Emotional design: why we love (or hate) everyday things.

Papanek, V. (1992). DESIGN FOR THE REAL WORLD Human Ecology and Social Change, Thames & Hudson.

Papanek, V. (1995). The Green Imperative Ecology and Ethics in Design and Architecture, Thames & Hudson.

Rochberg-Halton, M. C. a. E. (1981). The Meaning of things: domestic symbols and the self.

SECCO <http://www.seccoshop.com/index.php?k=3929> [Accessed July 10, 2010]

Seppälä, L. (2010). SUSTAINABLE RESPONSIBLE OUTDOOR CLOTHING - What every designer should know. Faculty of Art and Design, University of Lapland.

Seyed Javad Zafarmand, K. S. a. M. W. (2003). "Aesthetic and sustainability: The aesthetic attributes promoting product sustainability." The Journal of Sustainable Product Design **3**: 173-186.

Studio, S. H. H. R.-u. Studio HeStudio Hergebruik / Re-use Studio, Studio HeStudio Hergebruik / Re-use Studio. <http://www.studiohergebruik.nl/?page_id=238> [Accessed July 16, 2010]

Thorpe, A. (2007). Designer's Atlas of Sustainability: Charting the Conceptual

Landscape Through Economy, Ecology, and Culture.

Thorpe, A. (2010). "Design's Role in Sustainable Consumption "Design Issues 26(Number 2): 3-16.

Valtonen, J. M. a. A. (2006). Qualitative Marketing Research A Cultural Approach.

Vihma, S. (2007). Design Semiotics- Institutional Experiences and an Initiative for a Semiotic Theory of Form.

Vihma, S. (2010). ON DESIGN SEMIOTICS.

Walker, S. (1998). "Experiments in sustainable product design." The Journal of Sustainable Product Design(7): 45-46.

Walker, S. (2003). "Light Touch - The Design of Ephemeral Objects for Sustainability." The Journal of Sustainable Product Design 3: 187-198.

Walker, S. (2006). "Object Lessons: Enduring Artifacts and Sustainable Solutions." Design Issues 22(Number 1): 20-31.

Walker, S. (2009). "After Taste – The Power and Prejudice of Product Appearance." The Design Journal(12): 25-40.

Mickey Z. (2008). Green Glossary: Downcycling, planet green.com. < http://tlc.howstuffworks.com/home/green-glossary-downcycling.htm> [Accessed May 1, 2011]

Tu Tsui Shan (2007) Finnish living culture: Globe Hope put the environmental originality to fashionable runway, Pure Finland Design Let the world to see Finland.
涂翠珊 (2007). 芬蘭生活文化：Globe Hope 讓環保創意躍上時尚舞台, Pure Finland 設計　讓世界看見芬蘭.
<http://www.epochtimes.com/b5/7/8/16/n1803471.htm> [Accessed March 30, 2011]

Su Ping (2007) Cameron wears the embarrassing shoes which made in China, BBC NEWS.
蘇平 (2007). 卡梅倫穿中國鞋的尷尬, BBC NEWS.

<http://news.bbc.co.uk/chinese/trad/hi/newsid_6590000/newsid_6591100/6591101.stm> [Accessed March 10, 2011]

Bibliography of Images

Image 1: Mattozzi: Semiotic analysis of objects: A model

Mattozzi, A. (2010). SEMIOTIC ANALYSISI OF OBJECTS: A MODEL.

Image 2: the FREITAG message bag with user

https://www.facebook.com/photo.php?fbid=10150206846711423&set=o.17588922874&type=3&theater

Image 3: the concept of FREITAG

http://www.freitag.ch/shop/FREITAG/page/PAGE_F_CONCEPT/detail.jsf

Image 4: Klinik der Dinge had transferred an old computer screens into a light.

http://klinikderdinge.com/wp-content/uploads/2010/06/lamp3.jpg

Image 5: the concept of Klinik der Dinge

http://klinikderdinge.com/wp-content/uploads/2010/04/ablauf.jpg

Image 6: One of product from Worn Again which is windproof jackets sewn from pieces of an old hot air balloon from Virgin Balloon Flights.

http://www.flickr.com/photos/36940190@N04/3855092055/

Image 7: the concept of WORN AGAIN

http://www.wornagain.co.uk/pages/the-process

Image 8: GLOBE HOPE use different of recycling materials for making varieties textiles products for different season.

http://www.globehope.com/en/products/naisten-vaatteet/haapa.html

Image 9: the Studio Hergebruik / Re-use Studio and also shop in Rotterdam, Holland. Photo: Kati Noordhuizen

http://www.studiohergebruik.nl/wp-content/uploads/DSCF8753.JPG

Image 10: the FREITAG message bag is cutting from a piece of old truck tarpaulin.

http://www.freitag.ch/shop/FREITAG/page/PAGE_F_CONCEPT/detail.jsf

Image 11: the XXXL washing machines for washing cutting piece of old truck tarpaulin.

http://www.freitag.ch/shop/FREITAG/page/PAGE_F_CONCEPT/detail.jsf