Creative Up-Cycling

Exploring future possibilities in local communities towards DIY practice and sustainable lifestyle

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Abstract

The project elaborates design opportunities for a future practice that could promote alternative sustainable lifestyles on waste handling through *up-cycling* activities. It does this on a small scale through engagement in the local communities of the Hilda neighborhood and Segepark students’ accommodations in Sweden. To these communities, *creative-up-cycling* is explored which it introduced here as an approach where neighbors can participate in making new things from leftover materials. Through this work *creative-up-cycling* is a proposed recommendation for a possible service system on how to share the leftover materials in the local resident’s communities, as well as, how to remake the items no longer needed.

The empirical studies explore maker culture lifestyles and include how to find leftover materials, tools, space, and skills in order to guide people in *creative-up-cycling* alternatives. These creative activities also build social relationship via the integration of multidisciplinary citizens who are living in the same community and explorations were done on how could we elicit the skill sets from those people? What is a useful skill set in this area today? Values like mutual physical experience, reciprocity, and ownership could also be found along the empirical workshops in this project. Additionally, this report shows some interesting findings pointing towards the design process and the suggestions of design elements; ‘Co-storage’, ‘Mix and Match furniture shop’, and ‘Renovation and up-cycling’ concept elements.

Participatory design (designing with people) has been the core approach in this project. Additionally, I have been influenced by user-centered design, as well as service design approaches in order to comprehend the services, system and activities of recycling and *up-cycling* in cities like: SYSAV, STPLN, Cykelköket, Återskapa, Toolpool. The finding presented here are examples of practices that could make up the composition of recycling and *up-cycling* activities in future local communities.
Keywords
Sustainability, Sustainable interaction design (SID)
Interaction Design (IxD)
Up-cycling, Down-cycling
Craft, Craftsmen, Craftsmanship, Do-It-Yourself (DIY)
Open source, DIY Maker culture
Social innovation, Social based community
Local (residents) Community
Maker community, Communities of Practice (CoP), Flat organization
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Homemade Food, Thai Temple in Skåne and Social media
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Introduction

I have always appreciated people who use everyday products effectively. My disciplinary and career backgrounds, as an industrial designer, influenced me to become concerned with how to manage materials and objects in order to reduce waste. Working as a paper-product designer in a global company in Thailand has taught me how to manage dimensions and scale when dealing with large volumes of materials. Additionally, this experience has increased my interest in prolonging the useful lifetime of a whole range of products. In moving from Thailand to Canada, it was necessary for me to leave behind some of my creations, which held intrinsic value and that I wished to use again. I realized that if this quality could be incorporated into some of the objects that we no longer use, this might increase their useful lifetime and promote a sustainability lifestyle.

The product that someone no longer uses means waste to that person, but waste to one person might not be waste to another. In this way, waste is a general term that I view as subjective and inaccurate. Since it is a term of unwanted materials or undesired materials. Nowadays, sustainability has become a principal lifestyle for residents in many countries all around the world. Blevis claims, sustainability should be a main focus of interaction design and he calls this perspective “Sustainable Interaction Design (SID)” (Blevis 2007). He also guides several SID principles by linking invention and disposal and promoting renewal and reuse (ibid). In the field of sustainable interaction design, holistic solutions and the iterative design approach has focused on topics including (1) the materials used in an object, (2) understanding user non attachment, (3) design-before-design, design-in-use, design-after-use, design after design (meta-design), (4) supporting cultural and value changes through the non use of artifacts, services and (5) social innovation (Mankoff et al. 2007, Blevis 2007, Ehn 2008, Zimmerman 2009, Mullane 2010). Design is one way to promote sustainable lifestyles, however, design is no longer just a tool for creating sustainable objects, but also includes action platforms and intangible things that could encourage sustainable behavior (Stegall 2006). Additionally the various design methods, products and services are applied for improving the users experience in order to embolden widespread sustainable lifestyle (Stegall 2006, Stickdorn & Schneider et al. 2010, Meroni 2011). In this project, I aim to research how design within a local community context can promote sustainable lifestyles through a DIY maker culture approach.

According to the London Design Council, “eighty percent of the environmental impact of the products, services, and infrastructures is determined at the design stage” (2002, p. 19). This influences design decisions from designers and manufacturers.
“Design decisions shape the processes behind the products we use, the materials and energy required to make them, the way we operate them on a daily basis, and what happens to them when we no longer need them”, John Thackara (Thackara 2005, p.1).

How can design help people lengthen the utilization of their waste? As McDonough and Braungart stated, “lifecycle of a product can involve people in manufacture, design, environmentalism, related fields, and users’ behaviors” (McDonough et al 2009). People then could reduce the life cycle of waste of their products and services, but most are not concerned about it, especially the period of ‘after-use’. Instead, people more support the cradle-to-grave model, which have only a straight-line lifetime from production to landfill. As the following figure 1 presents, the straight-line of the cradle-to-grave of the items show one person could individually have various stages to throw items away. The green arrowhead presents a wide range of the undesirable period that could possibly bring the value of the items back via creative-up-cycling activities.

The use behavior is one of the crucial factors that can bring about either throwing away or up-cycling items in different periods of time. Fashionable items can impel consuming behavior at the desirable period, but it also can be sooner wasted even though they are still usable. Misuse behavior can cause a broken item ahead of time. We always own some unused items that are subsequently waste. Optimizing objects use however result in maximal ‘use period’.

![Figure 1: The gray scale diagram shows the cradle- to-grave model and the stage of creative up-cycling is shown by the green arrow.](image)

The graph in figure 1 explains that people produce leftover materials in any stage not always after maximal usage. This could also induce creative up-cycling possibilities.

Very few products are infinite, yet they may not seem invincible and are likely to diminish over time. Additionally, some people have more time than others. These make people accept a throwaway behavior as a norm and ignore the concept of up-cycling. They seem to find pleasure in the purchase of, “things that are brand-new made of materials that are virgin” (McDonough et al 2009, p. 102).
People have their mind-set on opening the new product (virgin product) for the first time like the metaphor of defloration. ‘This product is mine’ thinking. The manufacturers design and produce in accordance with this mind-set to fulfill people feeling as powerful, unique and individuals (ibid). These things make the life cycles of those items shorter in order to stimulate a brand-new purchasing behavior. One of the excuses to buy brand-new items is because of the perceived short life cycles of those items. If we look at the behavior of consumption closely in this small world, where you can buy everything conveniently from next door to across the world via the Internet, people consume globally but disposal locally.

William McDonough, the co-author of cradle-to-cradle, suggested that, In order to change from cradle-to-grave to cradle to-cradle there must be a change in people’s mind-set (McDonough et al. 2009). Cradle-to-cradle strategy is explained as a practical methodology to manage energy and materials in a sustainable way to promote up-cycled instead of down cycled or recycled” (ibid).

Bonanni et al. elucidated, “up-cycling considers how materials and products can gain value when they are designed for local re-use” (Bonanni et al. 2008). In other words, it is one of the possible ways that can increase the value and meaning of items, instead of decrease the quality of them overtime such as recycling. But what kinds of experiences bring people to (re) use items rather than throw them away? One expanse is personalized products, and through that provide added meaning to the items. Another reason is that, “up-cycling is a process whereby products can gain multiple functions after the original usage is complete” (ibid, p. 2558).

But, how can these questions be elaborated in a local residents neighborhood? What kinds of possible future practice inspired by maker culture are residents willing to embrace? Maker subculture likes Do It Yourself (DIY) could potentially support up-cycling and give prolonged life and value to items. Especially when it comes to furniture, one of the everyday life objects that I have found interesting during the empirical work in this project.

How can a community manage sharing items or leftover materials? Furniture, moreover, is one of the products that people can use, share, (re) make, but not necessary own. In a three-hours party, for example, a host would not have to buy a lot of new chairs if they were merely supposed to be used only during a couple of hours.

Additionally, the dimensions of furniture are big and tangible enough to set up a workshop for creative-up-cycling based community levels. Think about something like a chair for sewing, a table for drawing, a bench for gardening, a lamp for inspiring, etc.

In Malmö, Sweden, there are a lot of associations and services that support the DIY and Crafts, maker culture and sustainable lifestyles. People that share the same interests, the
same kinds of activities, and create a small group within a community are sometime labeled as ‘communities of practice’ (CoPs) (Wenger 2000). Several sectors and different maker communities, however, have their own specific structure, goals, practices, and their own skill sets to share. Also, they always use diverse materials for specific activities.

Additionally, the participants who use the facilities in the organizations, services have their own things to repair and have the same interests as the group. They have the maker passion.

The participants were interested in the activities before making things. Some people have merely interest but not actually make anything. These kinds of activities are called communities of interest, which embrace CoPs. This project, however, focuses on the groups that actually make things that they consider as CoPs.

The term ‘maker culture’, or ‘maker community’, refers to where residents live close-by, but they have a diversity of interests and practices that are not specific only to do an activity making. In this project ‘maker culture’ will center on up-cycling activities in a local context.

The scope of this thesis will be on a local resident’s community (see figure2) in a local neighborhood. The design space proposal will broadly focus on possible practices of local communities; temporary residents like a students’ accommodation and permanent residents in a local neighborhood (Hilda) where they co-own houses and share the local housing area, facilities, and media. I will elaborate on how a maker culture could make sense in these local resident communities and how the openness of design space of the creative-up-cycling activities could be a part of the creation of sustainability lifestyles within these local communities. In this report, I will explore how different maker communities possibly could influence the future practice of local residents in order to promote a sustainable lifestyle.

Speaking about sustainability, we usually think about ‘saving our planet’, which relate to ethical questions. To make it clear, this project is not focused on solving ethical problems, rather to enhance a quality of life for the future. In fact, promoting up-cycling activities does not mean avoiding recycling, but it is about the combination of the two activities.
Figure 2: The Venn diagram shows the scope of the project on a community-based level (up-cycled activities toward DIY & craft maker culture), the green circle represents existing maker communities and the red circle represents the scope of the project that refers to a local residents community.

The main research questions can be stated as follows:

1. How can design promote sustainable awareness via leftover items or materials in local communities towards the DIY maker culture approach for making a thing?

2. How can we design for sustainable up-cycling activities on a community-based level that use materials that we no longer use, but own?
The terms of Key words

Recycling vs. Up-cycling

Recycling is a form of ‘Down-cycling’ (Busch 2009). Recycling usually refers to materials from a previous use that get another incarnated through a waste management system (an incinerator) and is cycled one more time via the producers-consumers cycle on its way to the dump. “Most often the recycled one had a lower status than the original incarnation” (Busch 2009, p. 84). On the other hand, “Up-cycling is a form of recycling where the second incarnation is of higher value than the material’s original form” (ibid, p. 84).

Figure 3: Recycling vs. up-cycling (ibid; 84)

Flat organization

Flat organization refers to the peer-to-peer relationship inside a group of people. The roles of the participants, designers, organizers and facilitators have been blurred. Usually they take the role to exchange the knowledge in informal ways. Flat organization, however, usually starts from a small group of people who have a common interest. There is no hierarchy system in a flat organization, so the role of one’s responsibility normally takes turn in the group (Wenger 2001).

Local Community

A term of local resident’s community normally refers to ordinary residents within a neighborhood context. It refers to a group of people who live physically close together. According to Wenger, not every community is community of practice, so in this thesis I assume a community or neighborhood is not a community of practice or any form of associations (Wenger 2001).

Communities of Practice (CoPs)

Wenger states, “A community of practice (CoP) is a group of people who share an interest in a domain of human endeavor and engage in a process of collective learning that creates bonds between them: a tribe, a garage band, a group of engineers working on similar problems” (Wenger 2001, p. 2339). CoP has usually a main focus on the
development of “the systemic competencies of its members” and it focuses on collaboration and knowledge exchange (Iaquinto et al. 2011, p. 6). “There are three characteristics central to the existence of CoPs: mutual engagement in a shared practice, the creation of a common repertoire, and the negotiation of a joint enterprise” (ibid). “There are three characteristic central to the existence of CoPs: mutual engagement in a shared practice, the creation of a common repertoire, and the negotiation of joint enterprise” (ibid). CoPs, therefore, is everywhere and the heart of CoPs usually focuses on the social learning. Communities of practice are broad; it can be resident associations or educational groups and university depts., however, CoP is different from communities of interest like sport clubs memberships.

The communities of interest are wider than CoPs sense that the interest always comes first and the physical practice comes later. Nevertheless, this paper relates to CoPs more than communities of interest because participants usually get more sense on embodied making experience (making things), and face to face interaction rather than online making experience or being just memberships of a community, not actually make things. Additionally, in this paper, communities of practice mostly represent maker communities and maker culture (resident’s associations).
Chapter 1: Background

1.1 From cradle to where

1.1.1 From Cradle to Cradle

“A misuse of material is not just suicidal for future human generations but catastrophic for the future of life” (McDonough et al. 2009, p. 3).

As sustainable interaction designers, we may think about the primary purpose of a product or system in order to consider it as the whole. Some question might be, “what is the entire system—cultural, commercial, ecological—of which this made thing, and way of making things, will be a part?” (McDonough et al. 2009, p. 82) and “re-making the way we make things” (ibid).

Cradle-to-cradle is a support strategy introduced by McDonough and Braungart that view, “waste as food, as a nutrient for what’s to come. It is about how to support the biosphere and how to support the technosphere” (ibid, p. 5). It has employed a law of return with materials, which is about being beneficial of not destroying resources that we can pass onto the next generations (ibid).

The production line of every new product has required materials and transportation that create more impact than reused goods. McDonough points out that only 5% of raw materials has been used. That means the rest has been waste. They say, “everything else is designed for you to throw away when you are finished with it. But where is ‘away’? of course ‘Away’ does not really exist ‘away’ has gone away” (ibid, p. 27). To rephrase, everything that humans have created does not go away. We would not call something waste until we do not want to use those items or they are depreciated. Additionally, we can categorize comprehensively the waste into two main types; one is biodegradable waste, another is artificial waste. Even though the Earth can digest biodegradable waste, this process needs time. To make waste management more efficient, residents should separate at least biodegradable waste from artificial waste. This is due to the fact that every day we mostly consume waste from eating and drinking. If all waste was incinerated, this would become gas into our atmosphere, which does not go away from our planet. Scientists have said these substances cannot vanish from the world, but only change in form.

It is evident that there is no one single right solution to get rid of waste out of the world, so most factories are trying to sell something that is called eco efficient (ibid). They are trying to promote a good view of their businesses, however there are two sides of the same coin. People would like to buy eco-products but most of them still use plastic bags
at grocery shops. Replacing a paper book with an electronic tablet is another good example. People have started to change their reading behavior by reading with an electronic tablet. If the technology has not always been changed and the same device could be updated, we would not see a pile of electronic waste. This includes electronic accessories waste that contain cheap materials, which could not be recycled instead of a full shelf of good recycled paper books.

I am not expecting that everyone should be involved in the production line of mainstream factories or should avoid consumption. Rather, I want to put more concern on where the products come from and establish the idea of up-cycling in people’s minds. These is so waste can find the way back to the cradle again. Because everyone consumes every day, we should further closely reconsider our behavior of consumption and think about life of items after used.

1.1.2 From Cradle-to-Grave

Regarding the end of the process use, if people would like to know more about the product’s lifetime, which most do not know anything about, it is hard because of the mixed materials that make up complex products today. Actually, there is not a single good solution. First of all, most of the organic waste can be biodegradable, but it sometimes takes a long period of time to biodegrade. In some places however a catalyst is used to rush the biodegradable system. The biodegradable system also makes people get used to a throwaway habit. People think that every organic thing can be thrown away back to nature in some way, however, in the wrong place it may cause a negative effect. Throwing away a fruit seed is a good example. In the wrong biological area it might destroy a domestic agricultural system, as and this is one reason why law and regulations of U.S. customs and border protection does not allow any fruit or vegetable to be bought into the country.

Incineration is another way of waste reduction management. We can explain this process as waste to energy. It also promotes a throwaway habit by separating incinerable waste. Usually, people put waste in a combustible bin. The bin contains mixed materials that can be possibly burned, instead of going to the landfill.

Landfills are the worst process of waste management when you throw away waste that cannot be recycled. Some goods like televisions and mobile phones can be shipped back to the manufacturer, but the ones that often end up in the landfill in e.g. the United States are from China (Botsman & Rogers 2011). The effects of using landfills are bad smell, a source of pathogens or chemicals, and a lack of land for dwellers. This is not reducing the waste, but changing the place for putting waste away. Some island countries like Japan and Singapore are developing landfills to increase the country’s main land into the ocean. Both incineration and landfills mean grave.
However, in the world of capitalism, “throwaway products have become the norm” (McDonough et al. 2009, p. 97). Because the products have become cheaper, less durable and short cycle lives. “Who will repair a cheap hair dryer if it is much easier to buy a new one rather than sending it to a distant manufacturer or finding someone to repair it locally” (ibid)? Even though people realize that waste will not go away and still accept a throwaway norm, it has been a campaigned on Reduce-Reuse-Recycle (3Rs) during the last decades (Busch 2009). Moreover, when we think about the 3Rs, we usually attempt to tackle over-consumption by firstly reducing, and then reusing before finally recycling. Firstly reducing, we try to use less. Reducing means less wasteful use. Reducing is used to remind when people use non-renewable resources like oil, petroleum, ore, and natural gas. This includes the reducing of the energy, water, gasoline and the disposable products like tissue paper, disposable gloves, copies paper etc. Most disposable products are made for hygiene purpose.

Secondly, if we cannot avoid using it we will reuse it to extend the use period as much as we can. Reusing usually applies for renewable resources, the matters. The use period has some ends but most of the materials are still usable. This campaigned is simply to reuse again before going to the grave. The items are reused again usually in the same purposes. Reuse in this context may not add the items much more value. At least it adds some extensible use period and gives the products a longer life expectancy. Finally recycling, when we cannot further use it, it should be recycled. It gives another life of a product. Busch addresses, recycling is usually given a product less quality in its materials than the original one(Busch 2009).

In addition, the process of recycling not only provides us with a product of less quality but also increases contamination into another life of the materials. The results are weaker and less useful products. (McDonough et al. 2009) Most of the recycled products have chemical contamination, but are a lot cheaper than the original products.

We believe that these are the processes for making the world better in the last decade. These have become the basic activities that people must do. However, the whole campaign merely supports the cradle-to-grave life cycle. As the world population expands rapidly, however, the recycle is not the only solution to get rid of the waste from humans. As McDonough and Braungart gave an opinion on recycle that it is just as a pill to heal the world in the end of the river (ibid).

**Recycling is about being controlled?**

Nowadays, we live in a multicultural society. We integrate with a diverse network of people on a daily basis. In societies that promote recycling activities from the community level over the individual level, like most of the developed countries, each individual is
responsible for contributing positively to the environment. The easiest way to promote a sustainable lifestyle is to ensure that they either reduce, reuse or recycle (3Rs).

Simplistically speaking of recycling behavior, we usually think about sorting materials and throw each one into separate bins for incineration. People tend to sort their things if it is convenient enough or in order to have something in return. For example, the panta machines in front of every Swedish supermarket give people a coupon to exchange into coins or things in the store. Meanwhile there are some scavengers who see this as an opportunity to earn money from the streets. Scavengers help to clean the streets of course, but not all of the leftover packaging can benefit them. They are controlled by the system of the machines, so they specifically pick the leftover bottles and cans they are only allowed to sell within the country. Allowed bottles have barcodes that show how much money it is worth. This means that waste bought from neighboring countries are still waste in another place since no incentive it offered to encourage people to recycle it.

In the large scale, recycling is one of the existing solutions of waste reduction management that usually follows municipal regulation rules. It needs time, money and energy in order to reincarnate products. In a developed country, there are policies and regulations in order to control waste at a large scale. Sydskånes Avfalls Aktiebolag (SYSAV) in southern Sweden for example, provides private and company unloading waste places. Although, residents have to pay for waste management in some ways such as via the city of Malmö or the fee of transportation to SYSAV. Seemingly, then recycling is about being controlled.

Up-cycled, on the other hand, requires less. It is supporting “a diversity of needs and desires” (McDonough et al. 2009, p. 139). Additionally, up-cycling is an open-ended concept for everybody in order to promote sustainable lifestyle that embrace various activities including reduce, reuse, repair, remake, recreate, reconstruct, mix & match, mash up, exchange, and ‘use not own’ concept, but not directly recycle. Up-cycling usually gives more value for 2nd life of products and emphasizes on (re)using concept (Busch 2009). In order to extend the lifecycle of the products, people have to reconsider the everyday life products, things that they own and the relationships the items. In order to find that relationship, we usually refer to the meaning and the stories of how to use the products and by whom, rather than how to make them. In some senses, up-cycling products may be used for different purposes from the original ones. Making items, nevertheless, can potentially provide meaning and stories of its items, so up-cycling items usually are designed after previous used that allow owners have open-productions with their leftover materials.
1.2 Design Production and *Up-Cycling* through DIY Maker culture

In *up-cycling* perspective, Do-It-Yourself (DIY) is one approach to give second life of one product a meaning. DIY is not a new concept, since can be dated back to when people started making tools of survival. In the past, it was necessary to DIY ‘crafts’ things because there were no advanced technologies, and the products had various uses depending on the craftsman. The furniture in this period was mostly made with craftsmanship skills. In Victorian –era styles for instance, each piece of furniture was unique and made with a special technique. Most artists were a designer and a craftsman (a maker) at the same time.

Moreover, the DIY had likely shifted the main purpose into hobbies that can customize things in the ‘Mass Production’ era, where products mostly are produced by manufacturers because of the time consumption of making activities. The products during this period were standardized in the same form and dimensions for *one-size fits all*.

During the industrial revolution era, the issue of *one-size fits all* is found in the different human scales of different continental people, so it affects the ways of producing things. Manufacturers produce a thing for a worst-case scenario that can function with the same efficacy in any circumstance. “The designer goal at this time quite specific limited to the practical, profitable, efficient and linear” (McDonough et al. 2009, p. 24). These led to the process of *cradle-to-grave* strategy. This era manufacturers needed designers to guide the design because of the large volume of products. Designers were embraced with the user-centered design approach, although, most people were looking for a good brand that guaranteed the international style or uniform standard products, which were made by a big industrial factory. The import and export of the products were becoming popular because people still want unique products, so they would like to own outstanding things that not everybody could own in their local city. Besides, they try to customize standardized products to be their personalized products.

Because of the power of the computer and the Internet and the need of personalized products, consumers have interacted with the digital design process so the production during the last decade has more ‘Automake’; consumers and makers had played a co-designer role in the process in order to personalize the products but ‘Automake’ process still has the limitations of the productivities (Abel et al. 2011).

To avoid these limitations, there were several entrepreneurs occurring to be a meddle man between customers and manufacturers. This is a starting point for opening the production and customizing your products because once the manufacturers do not need to produce *one-side fits all* products any more, they reduce the size of their factory. Moreover, the entrepreneurs also have acted as a mini factory at some point. These raised
DIY movement usually refers to maker culture and maker communities because both have adopted the method of self-production or self-creation. Gautlett argues, “there is the everyday creativity flourish nowadays” (Gautlett 2011, p. 1).

From the pre-industrial era until now, the evolution of relationship between productions and consumers has changed; it is a closer distance and more collaborative. Everybody has at the same time a designer and a maker role. Open sources like Ardurino, the makerbot, that encourage consumers to access the data and the production part easier become popular. The widespread of the DIY furniture concept like IKEA can cultivate people to construct things at home, and bring the DIY craft culture back to the society. The service platforms like There I fixed it, mobile repair service in India or Cykelköket can open up the opportunity for users able to fix their own things (Abel et al. 2011).

As mentioned, making things is not a new practice Gautlett claims people still have been thinking about the meaning of making things, so “the power of making spreads beyond the online world to all kinds of activities in everyday life” (Gautlett 2011, p. 1). To make this making activity not become worse for the world, I combine the up-cycling concept of reusing of the scrap materials and DIY maker culture approach together. The makers have to make an object that can be disassembled (McDonough et al. 2009).

When making everyday products with old items or leftover materials, it brings everyday creativity alive. People feel empowered and proud when they make things (Shedroff 2001, Sennett 2009, Gauntlett 2011). To be sustainable, the acts of making, connecting and creating as a human need to be socializable, as Gauntlett claimed, “making is connecting” (Gauntlett 2011). We easily connect with others and ourselves by DIY making activities. In this connection, we create a group that has the same interest and this interest leads to some kind of practices, a community of making.

Generally, to form a community of maker culture practice, a community of practice (CoP) needs people’s skill sets, tools and space in order to inspire and sustain this activity by participants. To sustain a CoP, we usually structure the community into an organization, a form of association. However, within a community of practice in term of up-cycling perspective, I would like to explore design possibilities for the future practice that can shift the practice into the local neighborhoods. In a social innovation perspective and participatory approach on prototyping the future, everyone has a voice to find possible future solutions to promote and make sustainability together. There are no longer only designers and or stakeholder’s tasks any more.

1.3 Maker culture in Malmö

Sweden is one of several welfare state countries. There are various NGOs, organizations, associations, and CoPs, especially maker communities, which provide residents in socio-
environments for a lower fee or free of charge. This is a kind of *culture of supporting*. In this way, the scope of the research thesis was limited to a study of Swedish users, stakeholders, where resident’s co-making behaviors were researched in relation to different Swedish socio-communities setting. Presently, there are more than 1000 social communities, CoPs and marker communities and communities of interests, located in the city of Malmö. Additionally, most of the maker communities in Sweden have embraced the concept of sustainability, especially the *up-cycling* concept; Cykelköket, for example, is making a new bike from an old bike, Återskapa is making workshops from industry leftover materials. From both examples, we are made to reconsider using or remaking things from unwanted items, in which we call *up-cycling*. Additionally, to local maker communities we can also reconsidering the whole system of waste management policy in Malmö with semi monopoly company, otherwise known as SYSAV. In Southern Skåne, SYSAV gets a major role in incineration and recycling with municipalities and NGOs collaborate service about waste transportation through SYSAV.

In Malmö, garbage has been turned to something of value because people can sell it especially metal, the PETs and the packaging of cans as well. Most waste systems are usually managed locally, so the waste management costs are included in house management fee or rent. In a co-housing area, there is a small room or garbage house to throw away daily waste. A garbage house is locked all the time in order to limit the amount of household waste from non-habitants in that place. In this room, there are provided different types of garbage containers; for newspaper, plastic, metal, color glass, white glass, and combustible waste. If residents would like to throw away big items like furniture or computers so each household has to carry them to SYSAV by themselves.

1.3.1 Finding possibility in Hilda

*(Where permanent residents reside)*

How could we bring the concepts of *up-cycling* maker culture to a local community like Hilda areas? How can this project be a part of creating a sustainable community? Hilda neighborhood is located not far from the city of Malmö, Sweden. It is located beside Rosengård. There is a group called *Climate Coaches* that has been concerned about natural energy within Hilda. There is also a mixture of Swedish people and work labor immigrants arriving in the 60s’ 70s’ living there. Because of diversity of permanent residents, I believe that there are potentially highly skilled people living in this area want, but they have small opportunities to highlight their skills within the community. They co-own houses, facilities and media, and a local TV channel in the area. There are approximately more than 2000 residents living here. The architecture in Hilda does not provide attics for putting unwanted items but rather have spaces like a storage garage.
Architecture is still in the after-war style; with a boom shelter, which is of no use anymore. In that boom shelter you can see sanitary wares and glazed tiles because it used to be a showroom when a construction firm renovated the toilets.

Beside the daily garbage room, the community provides four big containers for residents where they can put away big items. The containers are located outside between the buildings. Usually they get full in a week. The community transports the containers to SYSAV, which costs 2000 sek each time.

There were some interesting that some of the local residents are involved in the *up-cycling* concepts like making bags from coffee packaging, gardening, etc. (section Empirical II).

![Figure4: An up-cycled bag made from coffee bean packaging by a Hilda resident](image)

### 1.3.2 Finding possibility in a students’ accommodation

**Where the temporary residents live**

Living in SegePark student accommodation, I have seen the opportunity of *up-cycling* concepts toward DIY maker culture based community approach while temporary residents have moved in and out. Students do not have much money to spend on things since they only live there a short period of time, but they have more free time than workers to spend time *making* together. Beside the Internet, furniture is one thing that can support student life in term of personal comfort and social life.

In SegePark, it is very difficult to find a common space to mingle especially in the winter; there is no indoor common space for students. Each room is like a studio; it has a small
kitchen, a restroom, a bed, a table and a chair. Thus, when students want to meet they have to bring their own chair to another room.

Above daily throwing, students have to find the place to throw away big items like furniture by themselves through going to SYSAV, selling items on the Internet, giving to other new students etc. Finally with time limitation for moving out, the furniture will end up being destroyed into smaller pieces that are thrown in the containers in the garbage house.

From these two possible case-studied groups throughout the empirical studies of the project, they are such crucial elements, which are a part of my analysis for suggesting possibilities of the future practices. In these elements, this sort of the bottom-up process can bring about an innovation. To be told, in every participatory design project. It is significant to define the specific users and or participants. And, as a designer the important question raised is how I view these two groups of people regarding up-cycling concept?

1.4 The Roles of the designers in a Participatory design project

To find the future possibilities for design in a place, designers do not only regard the target groups and their perspective, but they should also explore issues from several roles in order to support the local community in sustainable ways. In order to reach sustainability by designing, designers and users should together generate some knowledge or tools instead of designing objects that only represent their polished ideas.

Designers traditionally work for the representative users and stakeholders. However, in a participatory design approach I design with Hilda neighbors and students, not representatives (Westerlund 2009). Working with real users, designers should apply holistic approaches, and methodologies to inspire, steer people’s imaginations and actions (ibid). Designers usually practice PD by design together and making together. By using a DIY approach, it also opens opportunity for end users to produce the product by themselves (open productions). As Seravalli argues because of the open productions, the designing has shifted “from designing for to designing in making together” (Seravalli 2013, p. 14). From this shift, designers should support the concept that ‘everyone is a designer’ by using aesthetics along the ways of the design together process in a project.

In the PD project, it is obvious that a role of designer is as a facilitator and or as a provoker in order to support and lead workshops activities. In my view, designers can take any role in the design process, as long as they can open up for poking new ideas from participants or users. As Seravalli addresses, in the PD approach by making workshops together with users in some degree designers have a new challenging role in “how to leave the space to others in order to transfer ownership to participants even if this
implies that the designers role in the project becomes marginal” (ibid, p. 12). The starting point of this PD project is about bringing new possibilities of change, which are defined by the interests of the *up-cycling* makers, the conditions of the leftover materials, and the path to change (Bannon et al. 2012).

In the interview in the book design interaction, Dunny and Raby said, “we cannot change reality, we can change people’s perception of it” (Moggridge 2006). Like this wrote the concept of *creative-up-cycling* does not actually prohibit consumer’s behaviors, but it can drive sustainable awareness on their own creative products and the future situations of practice. Residents have possibilities to design and create their ideas alone or together in their everyday life in their local communities.

Because I as a designer have acted in different roles in the design process of this project, there were challenging tasks for me. On one hand, there was a risk of the results and outcomes. Acting in different roles throughout the project’s experiments might affect some parts of the reflections in each experiment. Moreover, different angles might increase the positive feedback, some not. These have trained me as the designer to be resilient, sympathetic, and less egocentric. Now the designer’s role goes beyond the aesthetic design for the end result’s tangible objects.

### 1.5 Sustainable interaction design (SID)

Interaction design is one of the design fields that can use design to influence a sustainable lifestyle. As Blevis claimed, designing for sustainability is currently only taking place in the works of interaction design research (Blevis 2007), but has large potential for further exploration, research possibilities, and focus. Sustainable interaction design (SID) is a starting point of a perspective of satiability that uses a design approach “to define an act of choosing among or informing choices of future ways of being” (ibid, p. 503). As Dawkins argued, “Sustainability doesn’t come naturally” (Dawkins 2001).

Stegall also points out the role *sustainable interaction* designers should practice in developing a sustainable society, which is to “not simply create sustainable products but rather to envision products, processes and services that encourage widespread sustainable behavior” (Stegall 2006, p.57).

As designers we have to create usable things or concepts in order to help promote sustainability, even if it is not necessarily to design tangible objects, even if products are 100% be recyclable after its use. One of the characteristics of interaction design for sustainability is to explore possible futures (Löwgren 2008). As McDonough suggest in *cradle-to-cradle*, designers for sustainability should design a product as a service that can be disassembled (McDonough et al. 2009).
In order to design for SID this work aims to show how the openness of the design process, within DIY in a local community, could sustain up-cycling activities and shape use behaviors because it leaves space for locals crafters to make any change and disassemble objects in the future.

1.6 Open-source and Trends of DIY Maker culture

I further aimed to find ways to empower residents in both permanent and temporary living arrangements by exploring the design possibilities within this research space. Regarding making things in general, the open source concept is growing around the world. Open-source usually refers to computer software with its source code made available and licensed that provides a free access and the rights to anyone to study, hack, and change for any purpose.

![Diagram showing the positioning of DIY or maker culture within four dimensions as labeled on the axes. The graph is from the online survey of P2P foundation.](image)

According to the Open Design Now book, the trend in the world of design today is affected by the maker culture and DIY movement where makers and users are allowed to document, modify, distribute and live in their own creations (Abel et al., 2011). Due to the trend of personalized design, users are encouraged to generate ideas and products artifacts using open production tools including using open-source code, FabLabs, sharing platforms, Communities of Practice (CoPs) and hacker spaces.

There open production tools bring design and production together such that end users now have the ability to make things on a small scale without the need for big industrial factories and equipment.
So called ‘FabLabs’ have been on the rise and during some MIT classes, participants have been able to make *almost* anything. In this way these students are empowered while doing and making things and will inherent as well develop knowledge and problem solving skills. An added benefit of this style to learning is that it is a pathway to more invention.

The purpose of open source and the Fablab is to provide users with an open platform to produce their ideas freely with technology or things that they have not been familiar with before. From this, it leads to new trends of skill sets such as skills to use 3D printers or a 3-axis CNC machines or laser cutter machines. However, I believe that this also creates some opportunities that could cultivate marginal people to make things. But how could designers bring these elements into the local community? How can one local community integrate the DIY production into the local system? One way is as Shedroff claims, “humans are inherently creative creatures and when we have a chance to create we feel more satisfied and valuable” (Shedroff 2001, p. 166).

### 1.7 DIY creativity with craftsmanship skills and productivity

“*One attribute that distinguishes us as humans is the ability to create things*” (Shedroff 2001, p. 166).

According to Shedroff, people are more comfortable with the term productivity in terms of its efficiency and value. They also usually make a distinction between productivity and creativity. Likewise, they often limit the word creativity to merely artistic expression, customized self-expression and hobbies. This productivity is most commonly associated with work, making and value creation (ibid 2001). Actually, time is the principal variable for productivity with handmade creativity, which sometimes reverses variation of proficiency of a maker. In this point of view, craftsmanship products are given higher value than manufactured products. One example is how the world of luxurious brand names likes Louis Vuitton, or Bentley, have had their brands related to craftsmanship for so long, while maintaining success with high price products.

These business models show how users are willing to pay for the unique products from distinguished craftsmanship. Users like the unique style and durability of the brand-name products that can guarantee the quality of the materials.

Additionally, people sometimes separate the DIY creativity from craftsmanship skills because of the tools and the lack of perfection of a final creation. Regarding the concept of DIY it is about something rough and easy.
Shedroff also states that the experiences of making DIY creative objects have a great value to makers and users compared to buying manufactured ones. Humans often feel proud and appreciate the output of their own creations (Shedroff 2001).

Since we are in the open source age and the widespread use of the Internet and open productivities, tools like a 3D printer, a laser cutter machine, or a 3-axis CNC machine gets cheaper and smaller. There is also a blurred line between customers and producers, consuming and productivity. These divisions cannot draw the boundary line between DIY creativity with craftsmanship skills and productivity.

1.8 Added values of making things within a maker community

David Gauntlett illustrates that making can connect both materials and ideas together in order to make something new (Gauntlett, 2011). He also believed that the acts of creativity usually connect one person with another and implicates a social dimension. Through making and sharing them in public, makers can enhance their embodied experience on making things through social and embodied engagement (ibid, p. 2).

Making things is valuable itself because of skill practicing. When one maker starts to do something new he or she might not have any knowledge, but once he or she has practiced it many times it is rewarding for their new skill.

Also, the maker community has been driving innovation when different people with different skills come together. As mutual learning and project goals are joined in this community this increases “the likelihood that all participants benefit in some way from participation while making” (Blomberg et al. 2013). Sometimes the members of a community might show some technique or some materials that one maker has never thought about before. Through participating in a maker community, participants will have “a new perspective on their own creative abilities” (Gauntlett 2011, p.2).

Makers could also gain added value when they participate in a maker community, even though they may be able to make their creations alone.

One maker community could bring people who have the same interests, but different skills. This creates a mutual learning experience. This exist for example in a community for knitting which might include housewives, journalists, bikers, students, designers, or other people in hacker space communities that are simply interested in knitting. It can be said then that the activity is the main focus of all participants in a maker community.

1.9 SID and Creative-Up-Cycling

The concept of SID is not only to design sustainable object for users, but also to make a platform for people to apply its principles continuously (Blevis 2007). For the platform to
be maintained it has to give some meaning to people since “humans do not see and act on
the physical qualities of things, but on what they mean to them” (Krippendorff 2009, p. 47). Designing for sustainability does not mean to design solutions to sustainability
problems or to ‘save the planet’, but rather it means to design for living with themselves
(McDonough et al. 2009).

Stegall also points out the role designers should practice in developing a sustainable
society which is that it does “not simply create sustainable products but rather to envision
products, processes and services that encourage widespread sustainable behavior”
(Stegall 2006, p. 57).

Maker culture activity is an embodied interaction act where people see themselves
through creation and the idea of making. People tend to engage with the things that they
are willing to build and make because they are unwanted items or materials. Makers can
customize their own creations, which gives meaning to the makers or the owners. Maker
culture then encourages sustainable behavior since it encourages people to reuse and
remake rather than throw away, that is, to up-cycle rather than recycle. However, to
sustain up-cycling maker activities people need to know information of how to find
materials, tools, space, skills, and people.

1.10 Sharing adopted Strategy: Reciprocity and ‘Use, not own’

Reciprocity, and use, not own concepts are sharing adopted strategies that have a common
element in both given and taken activities. For example a flea market in figure 6 below
shows one of the physical sharing platform possibilities in a local area.

Reciprocity strategy is about “I’II help you, someone else helps me” (Botsman & Rogers
2011, p. 132). A culture of direct reciprocity is about people responding face-to-face on a
positive action with another positive action such as transactions and exchanges with
relatives, local neighbors, as well as within the same small maker communities (ibid).
Reciprocity is a sort of local sharing that often is seen in a system that has a kind of trust.
This makes a system stronger with a number of different behaviors that alternately
“reinforces sharing, collaboration, honor, sociability and loyalty” (ibid, p. 134).

Another adopted sharing concept is called use, not own strategy. To promote sustainable
lifestyles such as the creative-up-cycling concept, people nowadays have adopted several
services like public libraries, zip cars and sharing bikes. The main strategy is to
collaborate in consumption in order to become a collaborative community (ibid). The
reciprocity and use, not own strategy can inspire this project in several ways.

The sharing quality of both strategies should be integrated in local areas. There are main
four stages that can apply these two strategies into up-cycling activities and possible
services.
First stage, to find leftover materials in a local community, sometimes residents want to get rid of their unwanted items and they need space to share or to exchange items and materials, such as an attic or a storage or a flea market (see figure 6). To apply these strategies for material exchanging usually refers to a system that is a hub to manage unwanted and unused resources. An attic or a storage is one of the possible spaces to share.

Second stage, for finding tools locally people need to have a network and or a good relationship between a renter and a borrower, or use a trustworthy system such as a library. From 2008, the emergence of worldwide sharing services in many places all around the world has shaped our lifestyles. One example is from “Generation Me to Generation We” (ibid). This has occurred properly in a combination between online and offline platform services systems such as Airbnb, Instructables, Toolpool (see section 2.4.4), etc.

Third, local residents need a shared space to DIY. Shares spaces encourage people to make things without owning a working space. Shared spaces can be virtual or physical, or a combination however in this thesis I will focus on physical space rather than online space. We cannot ignore completely online shared space however because it still plays a role in some kinds of booking system and promoting activities. STPLN for example of a sharing space that it can be further explained in next section 2.4.2.

Last but not less, in DIY up-cycling projects residents all have acquired maker skills. Additionally, in the content of making furniture, product designers and furniture makers with aesthetic sense are an important role in a local community to share their skill sets. ‘Skillshare’ is a good example site on how to match beginners with professional.

Figure 6: A flea market on National Day of Sweden in Folkets Park, Malmö 2013
Chapter 2: Related Works

This chapter presents related works that have been done on promoting sustainable lifestyles and maker culture and that inspire this thesis. Most examples are focused on social innovation and community based projects, which promote a participatory design approach. This approach has naturally been emphasized from the users’ side. In every related work, I explain the core qualities, the ideas, and findings related to the perspective I bring forward in the thesis. I also categorize related works into different groups according to big pictures of waste issues, up-cycling organizations and products that help recycling.

2.1 Big Pictures of Handling Waste

2.1.1 SYSAV

Sydskånes avfalls aktiebolag (SYSAV) is the biggest recycling company in the Southern region of Skåne, Sweden. They have more than 16 branches there and they receive every kind of waste from dead animal bodies to household refrigerators. SYSAV is a private company, which is owned by 14 municipalities. They recycle, and treat waste from households and business sections, but they do not have a service system to receive waste directly from households. Each household, community and company is responsible for carrying waste to the recycling plant that SYSAV provides in a local area. More than 15 different containers are provided for them for different materials in order to efficiently manage their waste items. During summer last year, in Malmö alone, there were more than 500 cars per hour using the recycling plant in the private sector. This number correlates with the number of things people consume. To me this is a good example of the final destination of the products lifetime, people can see how much waste they cause while throwing things away.

SYSAV also opens a materials shops for the public where people can buy new recycled materials such as soil that is made from decomposed flowers and pieces of unwanted ceramic from households. Recently, residents can now throw away their old items and buy recycled materials in SYSAV private plants.

Once you throw your unwanted items away into a giant tank, those items belong to company SYSAV. One reason for this rule is because SYSAV needs combustible waste to run the incinerator in order to generate the power energy every day, recycled materials to sell to other companies, and new products to sell directly to customers. Another reason is to keep up with the flow of customers that come to throw things away. This rule gives SYSAV several benefits for both customers and the workers who work in the site.
When I visited SYSAV a worker shared a story that one day an old lady lost her ring in the giant tank because she had thrown it with other old furniture from her home. She and her colleagues took over four hours to find her ring in the giant tank. This was an exceptional case. Considering these rules of throwing things in SYSAV site, what would happen if customers together can negotiate or exchange items before deciding to throw them away? This was the aim of the cooperation with the NGO Cykelköket and SYSAV in last summer. Cykelköket had kiosks on SYSAV sites where people could throw bicycles away for recycling with SYSAV, so in this way there was up-cycling with Cykelköket.

The result of this Cykelköket experiment found that people are willing to donate, share, exchange and give their things if they have a chance on the spot. These activities can raise awareness on up-cycling instead of recycling. There are some opportunities for some companies, NGOs, services who deal with materials or items in order to separate good things from waste before putting them to death. Up-cycling concept can prolong the product lifetime. The concept sometimes needs to relate to the bigger recycling system such as SYSAV (e.g. to get leftover materials).

2.2 Up-Cycling Organizations

2.2.1 Emmaus

It is a good deal if you can donate money and get a product at the same time. Emmaus is an NGO based social service that is located throughout Sweden. This organization cooperates with SYSAV and has a kiosk in SYSAV’s private recycling area in order to give people an alternative to recycling with SYSAV. Citizens can donate personal items such as old clothes, and shoes via Emmaus, then Emmaus will sell them to others later on. The money from this activity will be donated to Africa. The kiosks provided by Emmaus are like a box to receive the items, however, Emmaus employs someone who specializes in separating usable items to be at the spot too. This service does not only raise awareness on people’s consumption, but it is also a part of the bigger waste management system, SYSAV.

2.2.2 Apokalyps Labotek

Apokalyps Labotek is one of many design and innovation companies based in Malmö, Sweden. Petra and Jenny work at this company and aim at sustainable alternatives for the city. They do this by creating different kinds of projects like ‘the soap’, ‘the lamp blob’, mostly in collaboration with companies, institutions, and residents.

They are involved in a lot of interesting up-cycling cases such as ‘the soap’, ‘the lamp blob’, ‘the parquet’, etc. The soap was the first project from Apokalyps Labotek. “This
Soap was made from the oil from recycled deep fried oil from local falafel kitchens. The method and recipe was a new version of traditional soap production.” By collaborating with biochemists, they found out how to make soap with a few ingredients. This is an example of an *up-cycled* product; a concept in the process of line production, which re-use post-consumer waste materials to get a new different life. Additionally, this project preserved a local traditional method of making soap with local waste.

*Up-cycling* product companies can show how to design sustainable products for local people, and give people an alternative of *up-cycling* products that are made from local leftover materials (the material that designers could not expect size or quality before designing it).

### 2.2.3 Allwin

Allwin is a project that helps companies to take responsibility for their overproduction. The project cooperates with client companies such as food companies by adding a new line in the logistics chain. This line makes use of and transforms food that has been mislabeled or got a scratch in the package. Allwin does not only solve possible waste problems in companies, but they also assist residents to get cheaper products. At the same time, they also make people more aware about waste issue. They fill a boundary between factories and local residents.

From a promising approach to material management would be possible in our society if every production line could do something like ‘Allwin’. What effect could that potentially have in the world?

### 2.3 Products help recycling

#### 2.3.1 Minesaboveground.se

Minesaboveground’ started in 2012 and focuses on waste management. Their first product was ‘the bin’ in figure7 which is divided into 4 parts; food, paper, metal, plastic. This is really a four-in-one container that replaces the need to buy 4 containers for sorting their waste. The company claims that users can lower their waste management costs with up to 1400% with ‘the bin’. The simple idea of ‘the bin’ makes me wonder how simplicity can support social change and promote recycling awareness. Now they have launched ‘the bin’ throughout offices and companies in Skåne, Sweden.
Figure 7: The bin

This company works as ‘show case’ artists; they believe that green products can promote sustainability lifestyle. I agree with this view, additionally, a show case product has higher price than manufactured one, to make the products be a part of everyday life usually needs time for local residents to accept the idea and lifestyle.

2.3.2 Degoedzak: The good bag

In the Netherlands, Degoedzak is a new waste bag idea where a bag is placed on public streets with a transparent cover that provides people to see potentially usable items inside the bag. Other citizens who are passing by can see and decide if they want any of the items. It shortcuts the process for reuse by sharing through anonymous transaction. This also makes people aware of the idea to separate good things from waste and further creates a giving community in the area.

Figure 8: Degoedzak on the street in the Netherland

It is a good idea to apply this idea into different countries in term of a service system, hacking system of the normal garbage bag management. The good bag might work in a large scale as long as the objects can fit into the bags. In a local scale, if no one sees the potential of the old items, who will take care of them?
2.4 Sharing services

2.4.1 Plag[gi]at

Plag[gi]at is a clothing library in Malmö which provides members with the opportunity to rent old clothes. Plag[gi]at works as a showroom where an individual can become member for only 100 sek. The concept behind this service is to change the idea of ‘owning clothes’ to ‘renting clothes.’ they repair remix-match with used clothing, so the members will get the unique style of clothing. Additionally, Plag[gi]at received “Young people's innovation, a collaboration between VINNOVA and Tillväxtverket” award. To me this service can raise the ideas of 3Rs (Reduce Reuse Recycle) and be able to promote sustainable lifestyle in the long term.

This service is related to fashion and clothing, and sometimes the style might only be appealing for niche target groups. However, residents can apply this service model in their own local communities.

2.4.2 STPLN: The Place to share

Another example of a sharing service is STPLN in Malmö, Sweden that functions as a public workshop and creative meeting place. The space is separated into 4 or 5 parts: a living room for anyone and with free Wi-Fi, NGOs offices, Cykelköket, Material library, etc. The free space is managed for occasional events, workshops if you book it in advance. Usually, participants come from everywhere as long as they have good activities. This is to me a good idea for citizens to have space to mingle with some good tools while using the space. However, from the view of a sustainable community, STPLN needs to promote their activities and build more relationship with the local residents to sustain activities and promote a sustainable lifestyle.

2.4.3 SKILLSHARE: Sharing Skills

The slogan of Skillshare is learn anything from anyone. The Skillshare provides a global marketplace for classes. You can be a teacher, or a learner. It promotes your projects where you can let others apply the skills and techniques into the projects. This platform supports people all around the world to collaborate and share their creativity on everything from programming to craft. This is a good approach with a low threshold to learn things from skilled people available locally.

2.4.4 TOOLPOOL: Tools for sharing

Will you buy a hammer to only use for 5 minutes in 2 years? If not, then Toolpool is one of the options for borrowing tools that you only needed for a few hours or a few days. This service is located in Malmö, Sweden. The concept was transformed from carpool. And the service is very easy to use because it links to your own Facebook account.
Toolpool earn money from selling the materials like nails and screws etc. This sharing service idea could potentially become useful for local communities if people gather tools together and keep them in a common space.

2.4.5 The collaborative consumption hubs

These ideas adopt a *use not own* concept. It is an online marketplace that allows people to trade, rent, gift, swap, and barter items. The service allows users to be both a seller and a buyer at the same time. The eBay and Craigslist, peer to peer travel Airbnb are some service examples. These kinds of online market platforms can open 24 hours in a day, 7 days in a week across the world. (Botsman et al. 2010)

2.4.6 Camden.gov.uk

Camden.gov.uk is a UK government’s website that gathers a lot of the reducing, reusing, and recycling services that help you to reduce, reuse, recycle your things by your own or your community or recommendations of alternatives. One of the “Camden” column guides you on how you can reuse unwanted items. There are several ideas in this column;

- Charity shops: you can find the local charity shops close to you.
- Freecycle “Don’t bin it, Post it on Freecycle”, an online registry network.
- Ecomodo “An online marketplace that provides an opportunity to lend and borrow everyday objects, skills and spaces with confidence”
- Freegle “Don’t throw it away - Give it away” The ideas about all unwanted items from all donations and requests must be free and legal. This service is a national fundamental organization of people donating or taking free unwanted items
- EcoBees, you can save the planet when you start giving, getting, swapping and sharing items while EcoBees allows us to do these activities for free. This also provides us a map for finding the closest place. This is a good step for reducing reusing recycling projects in UK. Our world would be better if we have the same service as EcoBees in every country and could interconnect to exchange the items even across the world. These are some Local creative Up-cycling alternative service systems online in UK that could collapse transaction costs of unwanted goods. (Botsman et al. 2010) Some of them are well known as being a model guideline for other countries.
2.5 *Up-Cycling* physical-based services

2.5.1 Material Library- Återskapa

The Material library is located in STPLN basement. This is a NGOs based in Malmö. They collect different materials from diverse industries and transfer them into small pieces or display them in a ‘ready to use’ shape. There are a lot of colorful socks, and pieces of textile from a socks factory, color paper and plastic stickers from some companies, Ethylene-Vinyl-Acetate (EVA material) from plastic factories, Plastic containers from hospitals, etc.

The founder Carin is a former teacher from LA, USA, so it is not surprising that most of the users who came to the workshop are children from grade 8 to 12. At first, she started to contact the factories to get some leftover materials. Three months later, the factories like plastic plants, socks factories, hospitals and some of the participating companies have seen how the leftover materials are reused, since then they provide her the opportunity to come and pick them from the factories every second week. She argues that the users will get the sense of reusing and recycling things while recreating something during her workshops. Återskapa is open for the public every first Sunday of the month. Children and parents can select the materials in the workshop and sit at the tables where the equipment is placed. They can recreate things from the unwanted materials in the room by mixing matching, tacking, patching, weaving, etc. For a creative environment with reused materials, decorating by the recreated items, such as socks’ dolls, EVA lamps is very important in order to inspire participants. If they have no ideas what to make and how to make, Carin and Cia (a helper) will help them with their own material choices.

2.5.2 Make a Toy concept

*Make a Toy* is an *up-cycling* project where old toys are rebuilt to new toys by children. This workshop does not only raise children and guardians awareness on spending money on new toys but also does give them knowledge about materials. This project also has relation to a workshop in Hilda that was organized through the initiatives of those in the Hilda neighborhood.

A year later, there was one group of residents at Hilda who had seen the importance of old toys recreation, so they reproduced the concept of *Make a Toy* in the Hilda area again.

2.5.3 Cykelköket

The concept is to make an old bike into your own. The ideas behind were the founders’ hobby and thinking of the bicycle as transportation. They wanted to promote sustainable lifestyle through a workshop form and initiated *Cykelköket*, which is an organization that receives funding from *Arvsfonden* and cooperates with the city of Malmö, SYSAV, and
bicycle shops in Malmö. They are building the community by having more than 20 volunteers, having a basic fixing class and also having open time for the public. The key values in this example can be separated into 2 main ideas. One is about sustainability by reusing and or repairing unwanted bicycles. The other is about maker culture by using the peer-to-peer learning and DIY process for sharing skills and knowledge.

The Cykelköket was firstly managed more like an organization service before they had volunteers. They experimented with the idea to introduce it into some temporary residents places like Rönnen students accommodation, where they saw the opportunities with temporary students. Students want a cheap bike to use during a temporary period of time. Additionally, Cykelköket can gain non-ownership bicycles and old bicycles from Rönnen.

2.5.4 Swishing Guide Concept

Swishing is a practical guide concept, which encourages people to make a swishing cloth party. The things they suggest us to swish usually are clothes and shoes in your own place. The concept has guided everything from gathering people to managing leftover objects from the party. There are several potentials of this swishing guide concept but these need to try to fit into the local context. This is a crucial idea to inspire people with the guide.

2.6 DIY Crafts Up-Cycling online-based communities

Nowadays, there are several DIY online services which contribute to DIY movement and communities. These trends came from the rise of social media and Web2.0 (MySpace, Facebook, etc.). The DIY online services can help makers in their doing and sharing their documents online. This is a creativity exploration platform that can inspire new makers and be a channel to communicate by mimicking a physical maker community.

2.6.1 Pinterest.com / DIY&CRAFT

This is a kind of inspiration site of stock pictures that has started from 2010. You share pictures, pin (post) them and or follow people who have some interest or good stocks pictures categorized, that you are interested in. This is a kind of social network context. Users feel ownership instead of stealing the pictures. There is some sharing with DIY&CRAFT ideas that you can get inspiration to do. Users do not need to storage pictures on their own computer but rather create a kind of online community that builds on visualization. Pinterest provides an unlimited amount of inspiring pictures. In the perspective of DIY Up cycling community, Pinterest provides mostly final creations rather than showing the methods or how to find the materials.
2.6.2 Snapguide

“SnapGuide” is one of the DIY&CRAFT service (Apps, Web based) platforms, which support you to share your own methods and or see other ways to apply devices or ingredients on your own dishes. This provides a platform for you to snap photos of your methods and share them via other members, so they are able to click like or comment it. “SnapGuide” does not provide users only on the computer screen, but also an application that you can use on your smartphone or your tablet. This service makes numerous skills of DIY&CRAFT available across the world, which people can apply to their things. The con is that it will take a lot of time and energy to document your process and the audiences may not want to do the same thing as you have done.

2.6.3 IKEAhackers.net

Another inspiration site is IKEAhackers.net (2006). Because of the wide spread of IKEA products, every home has at least one IKEA product. The IKEAhackers.net is an online site that provides people with ideas about modifications on and repurposing of IKEA products. This mimics the IKEA concept of DIY products. You can upload your picture ideas with how to do it on this site and also download the other ideas. The site shows the ideas of adding on the IKEA products from small decorations to some others that require power tools.

2.6.4 Instructables; explore share make

Instructables is a platform that allows makers to share the instructive ideas on how to make things. It provides users to follow each other and share documents on website and mobile application. You can explore what people make and how to make it, in another way to share what you make to others. They have a special feature relating to a channel for contests in order to encourage users to make things. This platform is a good inspiration to DIY things at home and it provides easy ways to documents instructions.

2.7 Maker Organizations

2.7.1 FabLab

A FabLab is short for ‘fabrication laboratory’, a small-scale workshop. The idea started from a popular class in the FabLab program in Media Lab at Massachusetts Institute of Technology (MIT), USA named “How To Make (Almost) Anything”. FabLab is a maker organization business module that provides mini industrial machines like 3D printers, laser cutters or tools or space for people who would like to make something, in order to empower people, and bridge the distance between production and consumption. The FabLab idea can be one of the potential service concepts’ elements of this thesis in term
of a business and management structure model. What if local communities had their own FabLab in the neighbor area and felt ownership and a possibility of empowerment when using it. It would directly contribute to the local economy by using the local resource to create things, and additionally using left over materials.

2.7.2 Hackers space

Usually, Hackers space is a sort of flat community, unstructured organizations of maker practice context that occurs everywhere. Mostly, the members have a common focus on electronic, technology, computers, science, digital art and electronic arts. With the widespread culture of open source, the Hackers space idea is very commonly distributed and might be referred to hacklab, makerspace, hackspace. The hackers’ space is a model of peer-to-peer learning system, which mostly has focused on software rather than hardware. The members are mostly male and it is really hard to engage new female members. I will refer to some of related works later in Chapter 7.
Chapter 3: Design Theories framework and Method used

3.1 Design Theories

When exploring opportunities in the intersection between maker cultures and recycling and the complexity that arises from that, design theories helped me to guide my exploration process. In this research I used both empirical findings and theoretical inspiration in order to explore possible future practices and developing some concepts.

3.1.1 Research through Design

This is a research project, more specifically a research through design project, that uses design interventions in real world contexts to produce knowledge. In this thesis the design approach has been applied in every process in order to produce data, elaborate knowledge visually, and reflect on the iterative acts along the way of the workshops and field works. The mission of analyzing seemed almost impossible because of a vast amount of complex data gathered so for this work the research through design approach was important. It embraces iterative design, participatory design, and service design in order to analyze experiments and to make the intangible more tangible and visible. (Stickdorn & Schneider et al. 2010, Koskinen et al. 2011). This method provides alternative for future practices, instead of focusing on problem solving (Koskinen et al. 2011), Expressed differently research though design usually provides future opportunities that are not completely designed.

According to Jane Fulton Suri, it would be better to connect research and design because “Design was largely future-oriented; research focused on the past and the present” (ibid, p.ix).

Research through design usually guides designers and researchers on the context of use which is appropriate in the specific project. In this project I mostly use the field approach that places design in a social setting, particularly in the maker culture settings. It builds on social science and theories of social interaction that helps designers frame the design process and focus on the context of co-experience in the place (ibid).

3.1.2 Participatory design

One of the well-established areas of research through design is Participatory Design (PD). This research area merges practice within many areas of interaction design and information technology design. (Robertson & Simonsen 2013, p. 14) The roots of PD was during 1960s and 70s when Western societies had strong political and civil rights movements connected to work places. Workers demanded an increased voice in decision-
making about different aspects of their lives. They also needed to participate in “collective actions around shared interests and values” (ibid, p. 2).

That movement aimed to empower people at the workplace. In a similar manner this project aims to empowering residents through Creative Up cycling and DIY approaches.

PD is sometimes called Co-creation or Co-design, and by including participants with different skills it helps designers to make decisions and build confidence (Shedroff 2001, Eriksen 2012). The participatory design research and practice is an important field because it highlights the ‘how’ of design rather than the ‘what’ of design. (Blomberg & Karasti 2013, p. 41) PD is about “how design is approached as a process driven by social interaction and engagement” (ibid, p. 1). This means that ethnography and PD are closely related and designers use ethnographic approaches in order to investigate, understand, reflect upon, reflect in action, establish, develop and support shared learning between various participants. (Blomberg & Karasti 2013) Moreover, Blomberg & Karasti argues that the principles of ethnography and participatory design usually support designers to get a new perspective on their project.

For me PD in this project was to:

- Bring opportunities for mutual learning (e.g. maker communities)
- To respect and include different knowledge domains (e.g. maker culture workshop in my empirical practice)
- Connect and negotiate between participants’ different needs and project goals (e.g. Creative Up cycling workshop in my empirical practice)
- Provide tools and processes to facilitate design (e.g. insight of workshops, how people are interested in the design subject)

Ethnography likewise supported my design work by:

- Studying events in everyday settings (e.g. talking to people in their settings)
- Taking a holistic view (e.g. Textile department ethnography)
- Providing descriptive understanding (e.g. textile department ethnography, culture probe in my empirical practice)
- Taking a member’s point of view (e.g. textile department ethnography, culture probe in my empirical practice)

The core principles of both PD and ethnography go well together. They are a good mixture and enhance each other’s specific methodological elements in the project, for example by being able to zoom in on the inside perspective of participants where
designers do not need to design settings (ethnography) or able to zoom out where designers bring the PD projects as well as create the environments for the participants (Blomberg & Karasti 2013, p. 88-89).

Both approaches work well together to support designers with empirical findings. Another emerging field that potentially could challenge and inspire PD and that are relevant for this thesis is design for social innovation (Robertson et al. 2012, p. 55).

### 3.1.3 Design for Social innovation

It’s a broad field with different agendas and focuses. Traditional innovation often focuses on closed business models and closed labs with a product-centric perspective rather than the users’ value. The shift from traditional innovation to social innovation opens up for co-creation and participation. From these shifts the business models need the combination of professional researching and designing skills in order to move from lab to field (real life environments) studies (Robertson et al. 2013).

According to Björgvinsson et al. “Social innovation can be products or services just like any innovation, but they can also be a principle, an idea, a piece of legislation, a social movement, an intervention, or some combination of them” (Björgvinsson et al. 2010, p.3).

The main focus of design for social innovation is the capacity to both meet social needs and create new social relations (Robertson et al 2013 p.55).

According to Jegou and Manzini several “social innovations” are already embedded in different communities. This creates a partly new role for the designer who also becomes a facilitator. In the processes to transform everyday practices into innovation, designers firstly encourage people to act and make things that they usually do and use. Designers should provide the way to guide people imagination. From this, designers and practitioners together design everyday behavior to better future practices. Designs for social innovation can be guidelines towards better living conditions for people and accessibilities of the solutions (Jegou & Manzini et al. 2008). For example Jegou and Manzini describe collaborative services that can fulfill different kinds of everyday activities such as enhancing local visibility, fluidity management, offer different levels of involvement, etc. Their view on designing for social innovation can be seen as an intersection of “service design and design for sustainability” (ibid p.111).

Recent developments in participatory design could contribute to building new relations and designing networks that could bring forward embedded solutions. One example of this is how researchers and designers are connecting users and stakeholders for example in the DAIM projects where researchers at the Danish design school connected re-cycling companies, municipalities, user communities (Halse et al. 2010) or the projects of Malmo
living labs, where NGOs, municipal departments and private companies where connected (Björgvinsson et al. 2010; Hillgren et al. 2011).

3.1.4 Design for service

Interaction design is a broad field that embraces several design practices and research. One such discipline that is relevant for this thesis and that also relate to social innovation is service design. The common connotation of innovations is that its relate to technology. However, as John Thackara argued people can do more than technology can do (Thackara 2010). People focus then are more important than technology because technology is intangible and products should not be alone without any person interacting with it. Service design broadens the perspective on innovation compared with a technology focus.

Ezio Manzini frames this as design for service is “designing for something rather than designing something.” This means that the design is not the end result, but “an action platform” (Meroni et al. 2011, p. 3). The system or service can lead to different actions for the reconstruction, repairing, and reassembly of the components, which cannot be planned in advance (ibid). Many inspiring examples for creative re-cycling can be found within service design. In this work also, I have been inspired by techniques from service design such as post-it techniques, use scenarios and touch point diagrams to express the concepts and ideas. Usually the role of the designer is to listen and facilitate the discussion on what to do (ibid).

3.2 Design Methodology

In a complex project like this, creative-up-cycling, I have used a holistic methodology. I started the project by trying to understand the big picture of sustainability in the city of Malmö by using techniques of service design. Although post-it notes often are used within creative workshop formats, the practice of using them have a prominent position within service design where they are used for exploring possible services (Stickdorn & Schneider et al. 2010).

I also conducted personal interviews with four people who are involved with sustainability projects. I asked them several questions relating to sustainability in their respective areas. Afterward I analyzed the materials from the interviews, which pointed toward a common passion for maker culture, and that led to the design of a practical workshop, the maker culture workshop. This first workshop then led to an iteration of several maker workshops.

In parallel I visited the Hilda neighborhood while the community put four big containers in the area, that potentially could provide objects for maker workshops, and I launched
ten *Explore My Attic* culture probe sets in a student accommodation. Last but not least, summing up all empirical findings a final design workshop was produced to discuss and evaluate the concepts. Because participants in the community drove this *creative up-cycling* project, I hope that they sustain the experience and insights gained in this work.

To make the design project less abstract, Buxton suggests that designers should start from sketching the process (Buxton 2007). For me this sketching started first in the midst of the project, but it made it clearer for me on how to proceed with this work to bring it to completion.

![Figure 9: The process](image)

These are the methodologies and techniques that I used along the exploring ways in this project.

### 3.2.1 Ethnography methodology

Ethnography methodology is not a new practice within research based PD projects, however, since late 1980s, ethnography has been debated within PD in term of when it should be done. Ethnography could be studied to understand the practice, in this case the maker communities. Additionally, ethnography could help designers explore design interventions in a PD project (Robertson & Simonsen 2013). In my case I have been doing both but I started with the first approach and found that there are several ethnography methodologies that are suitable to this work such as informal talks, interviews, fly on the wall and other observation as well as culture probes. I aimed to use approaches that let me as the designers to know and understand people’s ordinary behavior in their natural settings and to not interfere with them (ibid). Below I state the ethnography methods I practiced and highlight main lessons learnt.
**Observations:** the simple method is to observe the participants in everyday natural contexts. I used this method for understanding the way that informal learning occurs in the community or workshops or maker communities. The challenge I faced as the designer was to play a transparent role in the place. Adopting a transparency role, the designer has to build trust and be a part of them. They are dependent on the situations that the designer would like to explore (Stickdorn & Schneider et al. 2010).

**Informal talks and interviews:** these methods were used to get information mostly about perception and attitude of the interviewees or a group of participants. Mostly, the designer will get the information by following the interviewees’ interests in some ways, so if the designer uses this method he or she usually knows the role of the interviewees in the beginning. The designer role has to be empathetic and be friendly while using these methods (Stickdorn & Schneider et al. 2010). At the beginning of the project I used this method to talk to several makers and people who were involved in sustainability.

**Fly on the wall:** The fly on the wall method is usually applied to some situation where the designer does not want to, or does not have a chance to participate in the activities. It is often with the aim of being more neutral. I used this method while participating at Drop in Arts at Återakapa (see empirical research 1).

**Culture probes:** Cultural probes is a strategy for gaining empirical material that often elicits participants’ attitudes toward novel interaction techniques (Gaver at el. 1997). In local communities this strategy could be a part of an ethnography approach that produces materials about user participants in their setting (Robertson & Simonsen 2013). The method of culture probes is often designed to provoke inspirational responses from the users (Gaver at el. 1997). It can guide participants’ documentation with photo and writing and even story telling. The participants will get culture probes, usually in the form of paper cards, which contain tasks or questions. They have one to two weeks to do the task. In order to understand the local cultures the cultural probes should not constrain my design unduly by concentrating on the needs or desires they already understood. The design probes could play a role of development and communication platform with the groups towards unexpected ideas, but the designer should not dominate it (ibid).

For me, in this research project I designed ‘Exploring my Attic’ probes that could provide “inspirational data with the probes, to stimulate” my “imaginations rather than define a set of problems” or information (ibid p.25).

The probe did not function as a limited or specific format, but rather supported an informal or experimental and generative approach. I learnt a great deal about the groups by discussing the materials and using it to spark a dialogue between the group and me.

In this context of the maker culture, this is a relevant method but some elements have been shifted to contemporary situations where people have their own cameras and smart
phones (instead of a camera as a part of the kit). The way to communicate to the groups have also changed towards social media, but we still had time to talk face to face individually. As a designer, this strategy was not focused on technology but on understanding technology as the way to communicate (ibid).

- **Story telling**, “Extraordinary stories about ordinary things” is one tool to build “empathic conversation” (Meroni et al 2011). This approach takes inspiration from existing research fields like ethnography, phenomenon, participatory and experience design (Shedroff 2001, Meroni et al 2011). Story telling provides insights behinds the things that people make, and was an ethnography method here. I used a story telling technique while doing ethnography at a textile department. For example one story was how they made textile designs with materials accidentally found on the streets. Another interesting story was how they made things from leftover materials rather than stick with old materials.

The story telling approach will unfold and emphasize the value of making things, and things that mean something to the makers. This also works as inspiration for other new users (makers).

For me, in the maker communities, this technique works as **Informal talks with the materials in hand** that is used for asking about things of participants own or what they work with. The designer role will be to listen and study the reaction from the participants who are talking. The materials in hand can elicit the memory of the tellers about the relationship between the materials and storytellers.

### 3.2.2 Workshops

A workshop is a popular format within participatory design projects to understand the use contexts and develop new solutions. The focus is usually on prototyping by bringing different kinds of people into the workshop. Robertson and Simonsen state that when people from at least 3 different stakeholders or different age groups or different disciplines come together in the same situation (a workshop), it usually generates some knowledge for the host and the participants (Robertson & Simonsen 2013).

Throughout my empirical studies, workshops have been a crucial driver to provide knowledge and ideas to the project. In order to capture design knowledge researchers and designers need to have an aim and create an environment to reflect upon a workshop and research materials (Schön 1992, Eriksen 2012). Additionally there are different tasks in any one workshop, so usually designers have a team to help to either drive or facilitate or document the workshop. In some of the roles, however, designers might just only be an observer or a participant in the workshop. The workshops of this project, to give some examples, had the aims of finding common interest within different maker cultures or
understanding and elaborate the concept of creative up-cycling. I created environments that could inspire, inform or challenge the participants to work together. For this I used images, (e.g. of tools, stakeholders, materials etc.) that could facilitate discussions and sometimes construction of materials where participants had to build things.

During the workshops I most often used a recorder and mobile phone camera to record the voice and pictures. I rarely used any video tool in the workshops because firstly participants would feel uncomfortable and at some point they would not respond naturally. For me workshops are a creative method that allow us to learn together and learn outside the intended scope at the same time.

3.2.3 Use scenario

A use scenario is a format where a service or products use situation is outlines in order to understand the actions and the sequence (time-oriented) in the real context. It might be a form of video sequence or visual illustrations like a storyboard (Stickdorn & Schneider et al. 2010, Meroni et al 2011) In the real complex world, designers do not merely design only a physical object, but designers should be able to create things in a broad perspective; including actions, environments, even people’s perceptions (ibid).

In this project I have used photographs to elaborate use scenarios in order to show how ideas could be situated in the real world context and to show the possibility of the concept in a future practice. This supports both designers and users to collaborate and imagine in the same situation, real life setting (ibid).

3.2.4 Analysis and Iterative approach

Analysis and iterative approach in a design research project is a common method to provide continuous feedback from real users to evaluate the workshops and concept development (people, technology, materials, design). This approach plays an important role in this thesis project where I have produced knowledge continuously and iteratively through a process of reflection in action. As Schön said “Design as reflective conversation with the materials of a design situation” (Schön 1992, p. 3). Designers make inquiries into situations of uncertainty through a process where the situation talks back (Schön 2003). In the empirical works, I use this approach to set up a reflective conversation with the design materials that I have produced and collected including the existing materials and practical works materials such as literature, observation, culture probes and workshops. For me the workshops have been a creative method for reflection in action where both designers and participants have gained new knowledge that we could not expect beforehand. During these processes the reflection of previous empirical work was used to reframe the next move of another workshop. The combination of the reflection-in-actions (during workshops situations) and the reflection-on-action (after workshop) had been used along the way of this design research project. I believe that
using these methods can help designers capture relevant design knowledge in the project (ibid).
Chapter 4: Empirical research I

4.1 Exploring the big pictures of sustainability

Preparation

The purpose of doing this work was to see the big picture of recycling practices and of up-cycling services. I used post-its to write and glued the printing of organizations, companies, associations, NGOs, people, key words, activities, theories, books, which involved sustainable lifestyle. There were two main components of waste reduction management that I wanted to explore. One is called down-cycled (Recycled): the method that degrades the quality of things and materials by using incineration or burying. This cycle has been created in order to solve the throwaway habits problems (Botsman & Rogers 2011). Usually, this cycle is provided by the big waste management company (SYSAV) and collaborate with the local municipality (in this paper I refer to the Malmö Stad). The easy way that people can promote sustainable lifestyle is to separate their own rubbish and other unwanted things into two main groups: ‘Biodegradable waste’ and ‘Non-Biodegradable waste’. Some private companies such as ‘Minesaboveground’, ‘the good bag’ have supported these people behavior. The other is called up-cycled: this cycle is to cut across the down-cycled process and usually the materials or the products will not be thrown into the incinerating oven, which mixes materials. This way usually uses the characteristic of the used materials in order to create a new item or reuse it in the differentia. Some of the materials still have the same quality as a natural version. Some have to adapt, mix and match with other materials. Moreover, there are a lot of design studios like ‘Apokalyps Labotek’, and communities like ‘Cykelköket’, ‘ÅterSkapa’ which has promoted these activities. Because of the up-cycled cycle, we cannot control the rubbish before remaking. The new items from this cycle usually look unique and fascinating per se. How do people make the new items more charming? From my initial exploration, they use different kinds of tools or machines, skills, knowledge and craftsmanship to give new life to waste items (See Chapter1 and 2).
Result

One of the ways to make the big picture clear is to use two by two matrix technique. To do this I rearranged and extracted the post-its into a two by two matrix and found relationships between the post-its (figure11 ). Vertical axis represents up-cycling and recycling and the other horizontal axis represent physical maker communities and online maker communities. Doing these I can identify the design challenge to explore and organize the existing knowledge from the existing communities of practice. The relationship of online and physical maker communities of practice will be explored.

Figure10: Post-its without organized in the context of recycling and up-cycling map.

Figure11 : the post-its with two by two matrix map

Figure12 : DIY crafts’ Physical and Online maker communities relational map.
From two by two matrix relationship in figure 11, I zoom in the graph again in order to rearrange it in different ways. The further exploration is to find the relationship of existing on and offline communities of practice (CoPs). I extracted the data into my thesis focus, which is on the DIY crafts Cop. The figure shows the relationship between DIY crafts’ physical and online communities.

**Re-Framing**

From this matrix relationship in figure 12, I experiment by reframing the graph two by two matrix in diverse axes; (1) households leftover materials vs. industrial leftover materials (2) DIY method vs. mix and match (3) kinds of materials-wood-metal-plastic-paper (4) recycling vs. up-cycling activities. I found out that maker communities cannot anticipate the forms of leftover materials in a place but they could have a specific set of activities in order to engage people to motivate participation in the communities.

**Reflection**

In the result, I could find the relationship of both recycling and up-cycling communities of practice both are promoting maker communities based on DIY crafts activities. Some CoPs like ‘Cykelköket’, ‘ÅterSkapa’ can guide and help people to prolong leftover materials before they end. Other companies like ‘Minesabovеground’, provide an easy way to separate the leftover materials into what they can recycle or up-cycle later on. There are some correlations between recycling and up-cycling which were discussed previously in chapter 2.

Additionally, the relationships between existing communities of practice (CoPs) can help designers further explore how they can shape the relationship within residential communities. I found that most of the maker communities, organizations and companies especially in Europe have up-cycling activities instead of recycling. Most CoPs have a combination that includes both recycling and up-cycling activities, so how can CoPs make a balance of those activities?

This experiment also produced new questions that could be relevant to explore further such as:

- How might different services in the same city share the material resources and tools?
- How could I see my different roles as an interaction designer in the process?
- What stakeholder would be relevant to include in the further design work?
4.2 Ethnography I: various thoughts on sustainability

From figure 10 given in the previous section, I continued the research by talking to different people who are involved with sustainability issues in Malmö city, for example waste management, alternative up-cycle organizations and who could see possibilities to promote sustainability in different ways. Simultaneously, I participated in some maker communities in local areas in order to seek out different kinds of people who potentially could produce diverse perspectives on sustainability issues.

From the map of previous section, I continued the research by talking to different people who are involved with sustainability issues in the city and who could see the possibilities to promote sustainability in different ways. Simultaneously, I participated in some maker communities in local areas in order to seek for different kinds of people, who potentially could produce diverse perspectives on sustainability issues.

**Sustainable Economy**

I did one interview with Trevor Graham, the head of KLIV, one of the two departments at the environmental office in the City of Malmö. The interview focused on a sustainable economy. His view of sustainability is to connect people in the city by using different kinds of events to bring them together. In order to make a sustainable economy, the city has to provide opportunities for people to spend money, such as Christmas market event, Malmö festival, etc. The money will circulate into the society and sustain itself. He also promotes the fair-trade system for the local products as well as open the opportunity for local residents to produce their own products to sell in the city. To sustain economy, people need to spend more money to circulate the economic system, to up-cycle is an opposite people spend less. After the talk we found that the system of creative up-cycling will affect a sustainable economy in term of exchanged things with money for example 2nd shops or flea market.

**Sustainable Products**

To gain understanding about the nature of how to give new life to things from unwanted materials I talked with Jenny, one of the Apokalyps Labotek company founders. She used to teach interaction design classes at Malmö University about using solar energy for making graphic and using wind energy for making patterns. Now she is involved with two companies both aiming for sustainability. One of her companies is about keeping traditional methods to produce products that mostly use up-cycled materials (see section 2.4). Most of her materials are from industrial factories, which are designed after the industrial process was finished and or during production. After I talked to her I came up with the idea that it would be nice if designers can be a part of material decision in every factory all around the world in order to manage the whole materials resources in the industry. What would the effect be in the world economy system and waste management
system? I believe that there would be a market demand for designers in different positions for up-cycling area.

**Sustainable Creativity**

I talked to Carin who runs the Återskapa NGO. The Återskapa is a space where creativity meets productivity, it is also called (scrap) materials library where people can ask for help about the scrap materials. The Återskapa provides classes and open public workshops (Drop in Arts). Highlighting the DIY Crafts activities and scrap materials from industries can attract people to come and join in the workshop. The activities here do not only drive creativity but also infiltrate an idea of sustainability through the process of up-cycling on leftover materials (see chapter 2). What if a local community can mimic creative-up-cycling activities like Återskapa, with local materials inside the community? Who would take care of it? What kinds of sharing space would be possible to use in a local community?

**Sustainable DIY Making**

Bertil and Ola who promote an up-cycling concept where to rebuild old bikes through the DIY process. The community of making your own bikes concept ‘Cykelköket’ has been spread through Malmö. This concept is very widespread successful something that is proven by the same workshop occurring in Gothenburg. At first, it was merely a service bike shop but after a while a lot of volunteers approximately 20 people started to hang out there and informal learning emerged within this space. This kind of learning encourages sustainable lifestyle in the society. They also did an experiment with SYSAV during last summer, where they got more than 200-300 bikes per day, a scale they could not handle. From this we can conclude that everybody in Malmö does not need to buy a new bike, there are enough bikes for everybody if we could manage a good system for supporting this re-cycling. I realized that the fixing bike skill sets are important not only in Malmö but around the world. Old bikes that they use for spare parts were from households, so what if every item in your house could be up-cycle rather than recycle. What if every one knows the basic skills to fix DIY things on your own. Not everyone can bike, so we can think about something that everybody uses everyday, then we imitate this business model to these other items for example furniture.

**Reflection**

From several interviews, I concluded that the different views on sustainability could open up the design space regarding sustainability issues. From the ethnographic activities I came up with questions instead of a clear conclusion; if creative-up-cycling concepts can be used in order to design for sustainability or its makes more complexity for final up-cycling items, and any position can help to promote sustainability lifestyle in the small level of the big scale in long-term. However, the most interesting point for me is about
maker culture because through the maker culture people are encouraged to reuse and maintain items for a longer time. What is the value of maker culture that brings people together? What is the common area of interest?

4.3 ‘Maker culture workshop’ Finding common interest

From the talks above, my interest was about DIY and maker culture, so the aim of the ‘maker culture’ workshop was to find the common areas of interest and the value. In this workshop was about bringing different professional makers together.

The roles of the interaction designer: a facilitator, a workshop leader

Preparation

The maker culture workshop was created in the morning on 8th, March 2013 at Medea. The workshop aimed to find common among professional makers. I also used this workshop as an opportunity to interview informally. Design dialogues was one format of interviews (Rehearsing the future, 2010) done and involved talking with more than one person at a time. I used the design dialogues technique to inspire this maker culture workshop. To drive the dialogues, I designed cards that were printed into 5 categories: key values, materials, machines or tools, activities, and logos that represents stakeholders. Every category also had a blank card to encourage participants to try free drawing or writing. To make them feel comfortable and fulfill trust, I asked permission to audio record the discussions and to take some pictures during the workshop.

Result

In this workshop I selected the participants from a variety of makers’ heads. They represented various stakeholders. Bertil represents Cykelköket, Marcus represents Fabricant, Luisa represents Hemslöjd, one of the traditional associations of Sweden, Anna is a PHD candidate who is involved in STPLN (See 7.3 in chapter III), who helped me run this workshop. In this 2 hour workshop I used the 5 piles of cards to guide participants imagination and encourage them to be playful (Design Research through Practice, 2011). I also began with the first question “ Can you present your community as a maker?” They explained their community one by one and what things they have made previously. Marcus said, “ I could define my activity into 2 communities, one is about making things like furniture, lamps something like these and the other is more about coding, programming.” Both are flat communities he would say because every time is almost peer-to-peer learning.

I observed that people divided the communities by activities and things that they have made. However, if someone belongs to a strong culture or the ‘brand name’ of the
community, instead of saying the actual activities they explained more the value of the community.

Figure 13: A picture from the Maker culture workshop

They picked the cards and separated them into 2 groups generally: the cards that represented their community and the cards that they wish their communities to be. They presented the cards, which held the value of their organizations. Additionally, they also picked the cards that represent other stakeholders which they have cooperated with, these could give a more strong image of their organizations.

Within sustainable concern, Bertil picked ‘You are what you do not throw away’ card, which illustrated their activities making old bikes into their own bikes. Some limitations of these young organizations were also identified such as lack of materials, money and even some with no permanent location.

Figure 14: The picture of the representative card

Figure 15: drawing ideas on the recycled-paper table spread

Reflection

From the workshop, I found out that various communities have something in common as a maker head and a ‘geekiness’ or ‘aficionado’ in their own interest. They also have or would like to have ‘a sustainable organization with active participants’. However, the key magnificent value of the maker culture within the community was identified as a social aspect because people cannot find this value online.

Marcus “we always start the time with Fika.” Fee-ka is both Swedish verb and noun and it means to drink coffee, to have a break. We learn and share things informally at the coffee table. Luisa added, “I can do knitting at home by myself, but I would not learn a
new technique from a maker next to me.” Her association mainly uses the old methods with new materials in the activities.

One crucial DIY finding that I would like to mention beside the contents of the activities was that they were using the same space at STPLN for setting up their activities at the beginning. For example they were involved with making furniture together from leftover materials (pallets, old bikes) like sofas, lamps, tables for using in the place. Additionally, I found that the space and the furniture are also important elements in order to support the activities for a maker culture as well.

Some questions were raised into my mind at the end of the workshop: what are the skills that mankind needs today as makers on recycling issues? What kinds of craftsmanship exist? I also discovered that the maker community does not only promote new ways of up-cycling, but this is as a cultural heritage (old techniques from skilled people). Moreover, the craftsmanship in the handmade objects is also filling generation gaps. Additionally, the maker community can blur the distance between production and users.

4.4 Reflection on Handmade things, which they made or owned in the place.

The main role of the interaction designer: a participant in a maker community

Preparation

Again, because maker culture is a very big scope, I cannot simply do my research at workshop events. It would be hard to explore its value only for a few hours. Therefore, I participated in the textile department in STPLN from the beginning of this thesis project, by meeting with them every Thursday in their space. One activity in that department included renovating the room together in order to have a nice environment until you make your own things individually. Participants remade the chairs’ seats in this workshop from the leftover textile materials last year, so each chair is unique and have a story. The textile department is a flat organization, or an unstructured organization. Everybody is an owner, as participants have the same right to lead the workshop.

Figure 16: A chair and a mirror, Hanna’s winter suit & hat and Jenny’s gloves
Regarding the name of this community, I found out that the former name of the department referred to ‘old lady craft’ but was changed because it is hard to encourage males to join in. The participants therefore include different age groups, from girls to retired women. However, no men are included within the study with this group. The leftover textile materials or old clothes have been collected from the different shops.

In this department, with a role of a participant, I have investigated that everyone uses at least one handmade item everyday. I also have a conversation with them about what handmade objects that they use today? Jenny who comes to the department every week owns handmade gloves. She explained that they were the Christmas gift from her grandma last winter. Her grandma made gloves for everyone in her family. Next to her, Henna was wearing the winter overcoat, and matched hat, which her mother made especially for her. She feels warm and pleased when wearing or talking about them. She also says her mother asked her not to wear other 2nd hand overcoats again. I see the DIY style and fashion inside those two items. Even though the items were using the DIY method they are so personalized and meaningful for users however, these were only for occasional gifts for specific receivers. The makers used their own ability freely to design the items with combinations of their own skill sets.

In the maker community likes textile department, there are open opportunities for participants or makers to make things (alone) together and the activities that can bring them together are more about making something that they can leave in the room like furniture and decorative items in the place. Participants have their own interest about textiles but they have different special skill sets such as knitting, sewing, embroidering, patching, patterning. They also work on their own creations (alone) while others together in the room.

Even the furniture in the place we made together with their skill sets. Two months ago before I joined the activities they made chairs’ seats with the old clothes and staple on the wood frames and painted old chairs with white color.

One time we designed and made two pin-boards from coffee bean bags in order to leave some notes and knowledge on the board. One who is good at structure measured the place and the wood frames by covering it with coffee bean bags with staple. After that we measured the wall to stick two boards next to each other.

A week later we made a lampshade from patching knitting pieces, Cia from Återskapa showed the techniques how to make form by using balloon and homemade flour glue. An 8 years old girl who came with one participant taught us the techniques like paper mache’ from a class in her school she said. She adds “we have to lay the flour glue on top to
cover the Knitting pieces.” After we made this we had to leave it until it sets into a form and we will assemble a light bulb inside later.

**Reflection**

One interesting reflection regards how they in order to renovate the room produced furniture through *creative-up-cycling* activities. These activities tied the participants together with the furniture that they since then have used every week. From making furniture together we felt belonging in the CoP. The knowledge could come from participants who have experienced making it before; other new makers can also learn by doing at the same time. Regarding some potentially valuable but missing technique from our repertoire we had to figure out new methods all the time. Generally speaking, crafted things do not have only meticulousness, but also do include deeply positive stories. I can see people put a value on their own everyday objects individually at least one item used is made from DIY crafts and also the DIY furniture together can socially tie participants within the place.
4.5 Things you cannot find from Google

The DIY crafts concept is not a new practice. We can see the trend from the Internet. In order to make things, we can find e-classes or any data from search engines like Google. As humans, why do we still need to participate in physical learning communities if you can find how to make things online or search engine in formal ways? To me, a search engine can give only a self-studying tool for finding the specific end results. You know before what you are looking for. You can get only an individual experience from sitting alone in front of the computer.

However, if you participate in a workshop you will find more innovative ways of learning, diversity of results, as well as mutual learning experience. I do ethnography in the textile department by focusing on the value of informal learning, and mutual learning, where the key is to be together in a place. Making alone together and making together inside the place makes the making more meaningful than if you merely search Google and do it individually.

4.5.1 Ethnography II: explore the informal learning within the textile department

The roles of the interaction designer: a participant, an observer.

Preparation

The ‘textile department’ is a new name of the ‘old lady craft’ as I explained in the section above. The ethnography is the most sophisticated and complex issues for the process, so the ethnography in the textile workshop will be mostly using observation that includes voice recorded and photos. I focused on informal learning in the textile department, so my propositions of these actions were: what they are doing and saying while doing their own creations.

Result

I jotted down, observed and recorded the conversations for three weeks in order to get insight in this maker community. Some of the conversations are in Swedish, so a friend of mine helped me to translate them. The conversations in the textile department were random topics but mostly were about making items or techniques.

There were various activities each week because we were allowed to work on our own projects. Interesting stories emerged between us while we were making items in forms that I never have experienced before. Also, the Swedish culture seemed to influence the makers in many ways. For example eating behavior could inspire to make a table cloth or an apron, making water proof textile flowerpots results from growing plants culture during summer, culture of giving gifts during Christmas time leads to making special objects, etc.
We usually had conversations about our projects and members gave their own ideas. In this maker community, people have the goal of what the final result would look like and practice the techniques 2-3 times before making the real one. Josefina is a good example for making a smock dress. She had come here every week and practiced on her small piece of smock (10x15 cm.). A week later she made a real dress. Making a tool is another good one. Alice showed a ‘kumihimo’ tool that she made to test it. She usually mixed and matched her clothes and asked for the opinion.

They were trying to have activities that used leftover materials from the industry as well as the activities that focused on the techniques like street arts activity, and the knitting activity.

**Figure 18** : Mutual Learning in the textile department

**Figure 19** : Josefina with her smock

**Figure 20** : A handmade kumihimo tool

**Reflection**

Informal and mutual learning can create ‘smiling dialogue’ with their own creations in their hands. Participants create contents by themselves. The materials (made by designers, participants) can guide the way of conversation and raise an informal learning environment. Every week, participants usually have their own agenda to make, talk and inspire others. Sometimes, when we have a lot of leftover materials like coffee bean bags or a new 2nd machine like a knitting machine, we usually arrange an event for that kind of the special activity.

Makers usually first make a prototype by creating their own tools (the sketching) and learn from the Internet, once they were familiar with the method they bring the sketch to the maker community where they will get additional knowledge and ideas from others instead of making it alone at home. In some situations we could find the solutions together or from someone who had experience in doing it before.
4.6 Fly on the wall on a ‘Drop in Art’ day

In order to understand the feeling and value of making things within a CoP, and leftover materials, I have a chance to observe these actions in the ‘Drop in Art’ workshop. To see and find possibility of the making activity based creativity.

*The main role of the interaction designer: an observer, a participant*

*Preparation*

First Sunday of each month, the ‘Återskapa’ (@ STPLN) opens space for the public to come and join ‘drop in art’ workshop. From 9:00am until 16:00 people, mostly parents and children, enjoy doing and making their own creations. The place provides stationary equipment, leftover materials from industries, which were resized and rearranged to fit into users and activities by Carin and Cia. The participants know them before coming here. I talked to Carin in advance, asking participants to observe and to photograph them. Additionally, preparing myself to be a creator in order to be transparent in the environment.

*Result*

![Figure 21: Some of the up-cycled activities of Drop in Art workshop](image)

In this time, most participants were parents and children. Some of them came for the first time. Being first time visitors, people were really impressed by the place with a variety of organized leftover materials. They explored the materials to (re) create and find the space to sit. Children grasped the paper tray with cotton yarn handles and walked to pick interesting materials. At the same time, parents watched their children and looked for some tools to help them (re) create some creations. The space environment is decorated with dolls, hanging lamps, and leftover materials to inspire participants. Carin and Cia were wearing the ‘Återskapa’ uniform in green. They help participants when they got obstructed. The creations of the boys usually were freak animals, humans, cartoons, vehicles, and spacecraft in order to play with them immediately after creating them. They felt proud of the toys they made by hand while playing with them together with other children. The girls were mostly making dolls, some decorations, some ornaments, and animals. They all brought their own creations home.
Reflection

As I see, participants especially parents give an importance to their child’s creativity. Within this workshop, it does not provide them a direct lesson for making things but its creation of the environment provides informal learning on recreating scrap materials to allow their imagination play. Carin wished people could give more value to scrap materials in indirect ways. Beside the friendly space and tools, the leftover materials from industry are an attraction for this workshop. The skill sets of adults could simply pass on to children. For me, this workshop was a *creative-up-cycling* kindergarten for rising awareness on sustainability in the beginning. Furthermore, the power of making and creating activity can bring about knitted-tie relationships in the family, peer to peer and or between generations. And the most important things were the stories and memories of making the creations that could bring them value in makers’ eyes forever.

The questions after participating in this workshop were

How might *up-cycling* scrap materials recreation process be concerned more about recycling afterward? For example, avoiding using glue in order to stick two materials together. What if users would like to (re) create some big scale items like furniture rather than decorative small items? What if every neighborhood had the ‘Återskapa’ what would happen in the area? If you had your own leftover items or materials in hand what would be the new creations?

Are there differences between household materials and industry materials how they effect makers’ perception on making?
4.7 Idle things to idea things - mini creative up cycling workshop

From Drop in Arts day, I created the mini creative up cycling workshop at STPLN on 23rd April 2013.

*The roles of the interaction designer: a facilitator, a participant, an interviewee*

*Preparation*

The aim of this workshop was to explore possibilities of the *creative-up-cycling* concepts. I collected the pictures and method of DIY and printed 5 inspirational papers. I brought my DIY handmade objects such as a bag, a sleeping mask, and a doll. I sent advertisement on the website and invitational emails.

*Result*

In total, there were 8 participants, one male and 7 females. Six of my participants were Swedish and the two were from Italy. I was surprised with a number of the participants and the leftover items that they brought during the way to STPLN. Firstly, we introduced ourselves, before our expertise, and our items. One of the participants brought the tool for reaching the apples by knotting a bow saw with a wooden baton. He also brought three gloves that he found in his attic. Interesting items are an old bicycle wheel, a broken wafer machine and broken table lamps.

Samar showed her bag, which was made from coffee packaging. The difficult part of making this bag was collecting coffee packaging because she does not drink coffee at all. She took almost 2 weeks to complete the bag. Anna showed her craft, which weaved textile on the old bicycle wheel.

“More than 70% of my home is from 2nd hand shops” Maja said. She is also planning for making a baby bed for her coming baby in this July. I showed a handmade bag that was made from the leftover textiles from industry, a doll that was made from an old sock, and five inspiring papers.
Figure 22: My bag made from leftover textiles from industry

Figure 23: The creations from participants: a wheel pad, a tool for apple tree, a bag

Figure 24: Fika and inspiring papers on the table
After we discussed with the leftover items at hand, we separated ourselves into 2 groups. One group knew each other before coming and they expected to build something with suggestions from the more professional makers. The other group discussed what could be the next maker workshop by the leftover materials at hand, as they sketched materials in order to rebuild a table lamp to be a hanging lantern. On the spot, reciprocity had occurred, we negotiated who would want the creation and what kinds of materials someone had to give. The hanger structure was made from leftover wood tray from Maja’s home, and the lampshade was made from old shell lampshade from Samar’s home. The hanging lantern was not finished; Samar brought it back to continue her creation. Also she asked for five inspiring papers to inspire her colleagues during the next meeting in Hilda.

**Reflection**

It was not the tangible result itself that I got from the workshop, but I can see a possibility of the DIY movement and the potential of the leftover materials in the city of Malmö. People would like to remake things that are useful including big scale like furniture. In this workshop we reuse items by matching techniques. The ways people worked with the scrap materials and the lifestyle with the 2nd hand items it had shown how much they are interested in up-cycling maker culture activities.

Most of them showed objects they have made from scrap materials, so the objects were manifested through collecting these scrap materials, using DIY processes, and their skills to recreate their own products. Participants presented their needs and they mutually
benefited while sharing their items and remaking together. Another interesting thing to me was that the numbers of participants were large probably because of their interest in the idea of creative-up-cycling. The interesting things were: How and where do we find the leftover items that are still useful? Who does specialize in materials that can help us find useful scrap materials?

Some concerns regarding aesthetics were also brought up, where some of the participants aimed for really professional levels of craft. What kind of aesthetic could be expected when amateurs are working with combination of very different materials?

### 4.8 What inspires to Empirical research II?

I have found several interesting insights from the empirical work I.

- An element of sharing (reciprocity) where leftover items (that are not valuable for the original owner) potentially could be valuable as materials for others in the workshops.

- Challenging to understand the need before the workshop has started (how can you match needs with resources and available materials at the workshop). How can we find a person who is willing to take a final creation from the workshop.

- Skills of the makers are important. Additionally, making skills are also including aesthetics aspects.

- Culture is one of the major factors that influence makers for making specific things (e.g. a biker community in Thailand builds on hobby biking, while in Sweden biking is used much more as an everyday transport).

- The need to develop up-cycling skills about how to assemble handmade things that could still be further recycled or up-cycled in the future (like not using glue for making some of items from paper or textile materials).
Chapter 5: Empirical research II

5.1 Participants

After I conducted the first empirical research the next step was to further identify potential design directions. I propose that the best way to understand how the maker culture could influence ordinary citizens is to show examples of objects, activities and behavior.

Participants in all the previous empirical work were invited because their interest in up-cycling behavior. These studies focused both on amateur makers and professional makers that belong in different maker communities.

There was a mix of both male and female participants who lived in Hilda students accommodation and were in professional makers communities. To influence this project, it was important that all participants participated throughout the empirical research phases in some point because of their maker perspective and the potential of influencing their neighborhood (local community).

Figure 26: The Participants
5.2 Explore My Attic exercise

‘Explore My Attic’ is a culture probe that I designed for users’ self-documentation. The purpose was to explore what things people have or own, not use. The meaning of the attic is broadly referring to space where users leave their own unused items for a while like a storage room, a garage. This probe can be a motivated tool in order to make people self-document and identify themselves by ownership. In this exercise I put the focus on leftover items or materials.

**Preparation**

I designed the culture probes ‘Exploring My Attic’ and printed them on 30 cards. One idea behind it was to make people aware on their own unused items, including which objects they wished to share, repair, reuse etc. Another idea was to understand the meaning of items that are no longer being used. At the same time, I was looking for residents who live in Sweden to be my participants.

![Explore My Attic culture probes](image)

**Result**

I left the culture probes of 3 cards per participant for 1-2 weeks and the participants wrote and photographed their items on the ‘Explore My Attic’ probes. I got some interesting pictures such as chairs, a bed, mobile phone, etc., which could potentially be remixed and rematch or exchanged to others (reciprocity in the community). On the backside of the probe cards, there were also personal questions in order to understand the relationship between the participants and their objects. The results showed that the objects or items were not important to them. The participants did not have much memories and experience with the items. This exercise provides them an opportunity to rethink about something you almost have thrown away.
Figure 28: Explore My Attic culture probes results

Reflection

This exercise raised the awareness of having items without using them. Participants started to change their attitude from ignoring those items into sharing, giving, repairing or recreating. They could see the way to do it by using the facilities of existing services like ToolPools, Cykelköket, STPLN etc. (See chapter 2). The probes was a great dialogue tool to communicate with people around this issue.

I could see the pros and cons from the materials or items pictures from the probes cards. First of all, there are limitations of the participants skills in order to reconstruct items alone, and the material qualities of the objects are not easy to be up-cycled. However there seemed to be some opportunities to customize the objects if they would know how to do it.

Also, participants differ between their own items (their need) and making things (up-cycled DIY), so for this exercise it was hard to analyze and connect it smoothly to the concept of creative-up-cycling.

Participants have unwanted or unused items in hand and the ‘Explore My Attic’ cards were about inspiring them to see one choice to get rid of their items by an up-cycled DIY process rather than recycling. If they could see the benefits of using a DIY method they could potentially reserve the time to do it alone or together.
The cards have showed that what you ‘throwaway’ can identify yourself! (Leftover materials). However there is an opportunity to develop ideas on a sharing attic space in the community, like having a flea market to exchange unwanted items (see section1.10).

5.3 The creative-up-cycling workshop 1st

The aim is to promote the concept of the creative-up-cycling. The workshop was held on 18th May 2013 at STPLN

The roles of the interaction designer: a participant, a maker, a facilitator, an observer

Preparation

From the last discussion with Samar at Hilda, she suggested that in order to attract people to creative-up-cycling activities in the local area, we should focus on making outdoor or indoor furniture and gardening. She explained that sometimes people would like to know their role and their task before they join in. I understood that people would like to know the context before they make a decision to participate, so I designed a workshop again with openness on the needs and activities about making furniture but more specific in the leftover materials where in this case I will use pallets. Additionally, pallets are common leftover materials that can be reconstructed into the activities as Samar suggested.

A week before I booked the STPLN space in collaboration with Anna, a PhD student, and Oyuki, the organizer of the STPLN space. I prepared the pallets and printed inspiring picture sheets about up-cycling furniture. After I knew that STPLN had available space, I promoted it with a Segepark student accommodation Facebook page event. Furthermore, I created the Segepark Facebook page during this thesis and asked Samar to join. The needs and making activities were opened for permanent and or temporary residents.

The day before I collected the pallets locally from the K3 workshop in Malmö university and from public spaces. I used a cart to collect leftover pallets or wood along the way from K3 to STPLN in order to prepare the workshop. The workshop was set for May 18th, which was the day of the Eurovision finals, and since Malmö was the host city this year I knew that there would be few participants for this workshop. I went to the place around 15:00 to prepare the space, tools and Fika.

Result

There were 5 participants including me, four were students who live in students accommodations; Sara, Rui, Anna and Me, one was an elderly female Swede; Jytte. The participants for this workshop then were all female. Firstly we looked over the leftover pallets that we had at the space, which I collected before. From some inspiring pictures, we discussed the need, what we would like to make out of it and who would take this
furniture later, after that we reconstructed the pallets into the form of a bench. We chose some of the good pallets to be the seat and filled the seat gaps with pieces of woods from another pallet. Afterwards we discussed further how the bench would look like. We started to make it right away. Anna represented the most skilled person who had experience with the machines and tools at STPLN and she taught us how to use them. We helped each other and found out ways to use the tools within the limit of leftover materials at hand. We sketched while making it. Sara asked for the opportunity to use the tools in this place next time. Rui focused on the idea of DIY furniture, without buying it from IKEA. After we finished making the seat, we took a break with Fika at the couch close to the working space. We talked more about general things and getting to know each other more. We also talked about the bench and how we could finish it such as, What method we could use for building the bench legs?

After we took a rest, we continued to discuss how to make the bench legs with tools or machines and leftover materials in the space. It took longer time than I expected and I realized that this is because we had never made a bench individually and definitely not together before.

Each one of us had unique experiences of benches before such as, Rui assembled DIY IKEA bench before, Sara has never experienced making furniture by herself but she watched a maker made a bench.

At the beginning, we need to decide the scale of the height. Jytte tried to measure height of the bench from sitting on a chair and measure how high would be comfortable for her. She wanted a height around 45 centimeters.

“How’s about making leg with the thick wood” I raised the idea.

But “we have no bigger machine to cut wood that is larger than 2.5”x2.5” and we have only 3 long screws” Sara added.

Rui came to the room and explained the technique of how a DIY of IKEA chair works in case we can use it for our bench.

Jytte came with a smart idea that “We just stick the piece of wood to four sides of the seat”. The problem was the pallets materials were too weak to support two persons weight while using this bench. Rui wrote down her idea on how the legs would be nailed to the seat and explained it to us again.

Re-frame

Now we reframed the construction idea again by cutting a piece of wood. According to the limitation of scale and quality of the leftover materials. The first time a piece of the pallet was cut in the wrong size. Rui came up with the idea of making stronger wood by combining two pieces of wood together. At 19:00, we were so tired but we wanted to
finish the bench today. We made a decision based on a suggestion by Rui. It was not strong enough to support the weight of people, so we cut another piece of wood to nail between two legs. Finally, we finished our bench! “What a wonderful bench it is” Someone said.

A few days later, Jytte contacted me again via email to help her to stick a piece of wood into the seat and sand it. I provided her with a can of wood oil and painting brush. Two days later she painted the bench by herself and planned to move it to her garden as soon as it was dry.

Figure 29: the bench and the participants

Reflection

Even though we skipped the collecting scrap materials part together, the participants experienced how to use the machines and tools, which they have not used before. The reflections of the workshop can be summarized from different perspectives.

As a designer

1. Before making a workshop - Matching some makers with a wanted final creation that could be given to another person is the most challenging for designer who set up the workshop.
2. During the workshop - I felt frustrated sometimes, such as when we had an argument on how to do the bench legs, but as a designer in this research project I had to give space for the other participants to raise their ideas. After discussing ideas to make some parts of this bench together every one felt ownership of the bench.

As a new maker

The amateur makers saw the opportunity to make furniture at home and an inspiration to re-make their furniture. The workshop was a place for negotiation because there was a need, a person who would take care of the creation after the workshop and there were makers, participants who co-made that creation (see section1.2).

Quality of the work and the limitations

1. The mutual benefits or reciprocity came while making and discussing. Some ideas were good but not suited in the situation, where we had the limitation of leftover materials, the limitation of the tools, and time constraint.

2. Additionally, this experiment brings the conclusion that the concept of creative-up-cycling is possible as long as the participants have a good content of an activity in order to engage them to make the bench.

Things that are necessary for creative-up-cycling workshop

1. Good tools are necessary for this workshop.

2. A big creation as a bench needs space.

3. Not only the skills of making to use the tools is acquired, in this case, a skilled practice of making aesthetic objects is a necessity too.

The evidence of this workshop had endorsed the creative-up-cycling concept and the next workshop.

5.4 The 2\textsuperscript{nd} Creative-Up-Cycling workshop 2\textsuperscript{nd}

\textit{The roles of the interaction designer: an expert maker, a content creator}

\textit{Preparation}

From the last workshop, the bench was a good instance of the creative-up-cycling concept, but I conducted this workshop to experiment further on the perspective of the role of a professional maker. This workshop was conducted on 30\textsuperscript{th} May 2013 at the Textile Department in Malmö.

Three weeks before the date of the workshop I asked Cia to order a pack of origami papers online because I could not find it from any stationery shop in Malmö. The online shop used was called Skapamer, and 4”X4” origami paper with random patterns on the
front side were ordered. One week later we got the papers, so I brought them to the textile department in order to create the content of the activity. I was also promoting the workshop via the textile department’s Facebook page. I saw the origami paper as a tool for practicing in order to transfer techniques to leftover textile materials later.

At first, I thought about a form of origami that could be good to transform to other materials. I came up with the form of a bunny. I practiced folding for a while both on origami papers and then on different kinds of leftover textile materials. After that I drew instructions on how to fold the bunny.

We promoted the activity with the sentence ‘How to transfer origami techniques into leftover textile materials’. I came to the department early and pinned the big instruction paper on the coffee bean board. Monica came and prepared the equipment including iron, glue, paper and tape for use in the room.

**Result**

As soon as I spread the event the members in the group on Facebook were interested and shared the event contents. I expected there would be a large number of people participating, however, that day was a sunny day so most people wanted to be outdoors. The participants were just 6 people including me.

They were expected to learn the origami techniques on textile rather than only on paper. The paper however is a sketching tool for this workshop. At the beginning of the workshop, participants were interested in patterns on the origami papers. They picked the one they liked based on patterns and colors.

Monica would like to fold the birds with her grandchildren in summer. She said, “The bunny form is so advanced for children”. At the same time, Alice was trying to fold one algorithm into each origami paper step by step. She wanted to document it by herself. Jenny was following my teaching closely. She was frustrated sometimes when she could not make it. Monica told her to fold 1000 times, and she would be an expert. I taught how to fold a bunny because it would be nice to transfer this technique into textile. An origami bunny has functionality as a container, if you fold it with paper, it could contain candy in Easter. If you apply it with textile, it could function as a plant container in the house. I did not consider however that it could be a bit tricky for beginners.

Jenny and Monica asked to make a bird instead, so I changed from folding a bunny form to a bird form. Sara and Simeon helped me document the workshop. They also learned how to make a bird and a bunny. Because of time constraints we could not transfer this technique into any leftover textile materials.
Reflection

As participants in the workshop

1. You never know what will happen in the workshop, so an instructor should be prepared and expect the unexpected. The environment of the space and the number of the participants affected the workshop for example if more skilled people participated in the workshop, it would be a lot of new advanced skills practiced in the workshop.

As an instructor

1. An instructor should have diverse skills in the area in order to adapt in a moment. As mentioned, the skills of the participants affect the workshop’s environment, so an instructor could pass on skills and techniques to the right style, not too easy or too advance for the audience.

2. As professional maker role or an instructor in this workshop additionally I wished to get impressions from the participants

Quality of the workshop and limitations

1. The good content of activities could involve people who have the makers mind. They, for example, discussed their previous origami skills while folding a paper, they also think about how to add function to the final origami that they created such as a bird mobile.
2. Most of the participants however would like to add new skills rather than an end result, an object, then participants and I saw the origami paper as a tool for practicing skills.

3. The maker community of the textile department has a neat space for activities, but limit the number of the participants to use each time.

5.5 Sum up Empirical stage I and II

In empirical stage I and II, the designer had various roles in each stage such that sometimes the role have good potential to elicit participants’ thought while making a thing and could affect makers imagination. Most of the empirical works the designer leave space for participants to create their own creations. The reflections of a different roles of designers might effect the design directions on the other hand there were some interesting things inside which opened the designer’s perspective.

The criteria of the city of Malmö and the communities on the creative-up-cycling concept in this research framed the design principle for this project while previous reflection empirical work leads another empirical study. This brings some value across all of my empirical works that it could guide me to the creative-up-cycling concept in the next chapter.

The empirical studies showed the possibility of up-cycling activities as the need to include good tools, enough space, potential leftover materials, professional makers who have skills set plus aesthetic sense and local residents, who could capably influence and sustain these activities for a long term. These are five design ingredients that I explored during the empirical works and these ingredients could potentially form the up-cycling activities that gave the value of the activities along the way which can potentially guide the design directions of A-B-C in the following chapter.
Chapter 6: The Creative-Up-Cycling concept

Even though there were a lot of stimulating studies from empirical stages I and II, it was still not easy to translate insights gained into design opportunities. One of the opportunities that I could see however, was that several ideas from the established maker cultures in Malmö also could make sense for other citizens and residents in different local neighborhoods. It seemed also, like although most of the established maker communities in Malmo focused on textile, electronics or bikes up-cycling, furniture could potentially also bring people together. Below I outline a general framework of a concept that will be elaborated and explored further in chapter 7.

6.1 The concept and the 5-design ingredients

The creative-up-cycling concept is a creative form of waste handling, based on local communities, and through DIY maker culture with a focus on furniture. The concept purpose is for local communities and Students’ accommodation.

With the making process of creative-up-cycling, the studies have shown that it contains five major design ingredients along the way. As long as you have one of the ingredients in the cycle then you have a starting point and then you can find other ingredients to up-cycle things. The five design ingredients (see figure 31) that I found for creative-up-cycling activities are:

1. **Leftover Materials**: there are 2 categories of leftover materials that have a different thinking process on how to re-make when it comes to up-cycling activities:
   1.1 *Households* leftover materials
   1.2 *Industry* leftover materials

2. **Tools**: this includes machines to remake things.

3. **Space**: this mainly means the space for making activities.

4. **Skills**: maker skills plus aesthetic skills or aesthetic sense

5. **People**: as elements of a local community, people are one of the necessary ingredients in the creative-up-cycling concept in order to create a mutual learning environment that sustain activities.
To make the process of sketching the various issues less abstract, I also created the visualization diagram above which shows the design principles that allows me to conceptualize and understand the relationship between neighborhood and existing maker communities in different layers. In this section I define interesting keywords from the empirical studies in order to find themes. From the themes I aim to indicate the directions to use for sketching and developing of the creative-up-cycling concept elements (themes).

6.2 The design principles

Figure31: The 5 Design Ingredients of the creative-up-cycling concept

Figure32: Visualization theme of design principles in this thesis for sketching concepts. The triangle represents the design space, and the spots are representative of the possible concepts, including the 5-design ingredients inside.
From the 5-design ingredients figure above, the *creative-up-cycling* concept features five (5) design ingredients (Leftover Materials, Tools, Space, Skills, and People) and has been aligned with the research questions that focused on the local communities (the main research questions can be found in page16). The design principle figure mainly shows the relationship between recycling and *creative-up-cycling*, online and physical existing maker communities in relation to a local residents community.

The empirical studies have shown that there are two qualities that are able to reflect the main concept through the DIY maker culture: reciprocity, and ownership.

In addition, each quality has been expected to create reflections on the main concept of *creative-up-cycling* and brought about the following design directions.

### 6.3 Reciprocity

The concept of reciprocity or *use not own* concept is embraced in mutual learning that emerged throughout the studies in several stages. This theme emphasizes a sustainability lifestyle (reducing waste) on a local confined scale. This happened in the conversation on the make (alone) together in the existing CoPs, as well as the local resident communities.

The use of the furniture, tools, space, learning skills and sharing skills are included in the reciprocity theme. (see section 4.7, 5.3)

#### 6.3.1 Mutual experience sharing:

The empirical studies have also shown that physical maker communities support mutual experiences sharing more than if you are making something alone at home. This was especially apparent in the sharing Skills experience and the final creation (the bench) (see section 5.3) in the workshop. During this event both the givers (makers) and the receiver (the owner of the object) worked together. In the textile department, participants elicited their experience on making a thing and shared and transferred the Skills, techniques to other participants’ works.

The form of reciprocity in a maker community is apparently not limited to only individual sharing with one to another but also sharing of physical objects.

In this *up-cycling* project, mutual benefits are experienced from having to think about reducing waste instead of increasing it, so it would be necessary to find an owner of the final creation before starting ‘make it together’ activities otherwise the final creation may be a waste or a complex product afterwards. The bench in section 5.3, for example, was wanted by one of the participants in the workshop. The reciprocity could be in the form of a transaction system, a public Space of exchanging: Flea market, Library, etc. (see section 1.10, and 5.2), a (NGO) company like Emmaus, Cykelköket (see section 2.2.1,
2.5.3). The transaction system is through the form of reciprocity, also challenging the usage. It is not only about making. This guides to the possible design direction below.

*A: Supporting Creative-Up-Cycling and mutual sharing of experiences through connecting to and build upon service systems that already exist in society.*

### 6.4 Ownership

When it comes to maker culture, creations of *up-cycling* have increased the value to more than the original item. A common value when you are making a thing is to be able to own it (see section 5.3).

#### 6.4.1 Embodied Making Experience

For amateur makers, participants seemed to create or repair their objects based on their interests and needs (see section 4 and 5). The creation often developed stronger meaning during the making experience. The first creations often had the most meaningful and strong memories for them. This leads to the possible design direction B:

*B: Create the embodied making experience from highlighting the process of making.*

#### 6.4.2 What makes you accepted in a maker community?

Professional participants seemed to maintain the final creations relied on a high standard. The meaning of items and making is associated to individuality and the impressions they wished to make on others. (see section 5.4) The creations have an impact on ‘*showing off*’ potential.

Showing off final neat creations could potentially prove that they are professional makers to others and it shows a worthwhileness of making time. Other amateur participants additionally could accept one as a professional while he or she does maintenance the items that they made or use such as bike cycle, furniture and clothes.

*Up-cycling* activities require existing of makers skills plus aesthetic skills that they could apply their skills on any leftover materials that cannot expect size and quality. These skills could bring about acceptance of professional makers.

Professional makers or craftsmen could address a story that has value and meaning (see section 1.7-1.8) such that value they gain from making their own creations is much more than ones bought from factory. They provide a unique meaning for users and have been widely accepted. From this creation story could inspire new makers to collaborate in *up-cycling* activities.

Any one could be as a professional maker in the subject that he or she are passionate and interested. I believe that once local residents accept the they themselves could spread the opportunity on *up-cycling* DIY activities.
This leads to the possible design direction C:

*C: Spread the design opportunity towards DIY craft activities and the raise of Up-Cycling sub culture in local communities.*
Chapter 7: The Concept Elements

7.1 The Design Workshop

“All communities, whether online or not, take time to develop their cultures” (Shedroff 2001, p. 190).

To elaborate the concept of creative-up-cycling further I planned a design workshop with Bertil, one of the Cykelköket founder, people from the Hilda neighborhood and participants from Segepark students’ accommodation.

To generate concept elements, I conducted the design workshop in order to elaborate possible future practices. Concept elements were the details, the ideas and the themes that were expected to the represent the whole concept of creative-up-cycling. (see chapter 6)

Preparation

I planned the discussion, including what if and use scenarios techniques in the workshop. The concept elements or design repertoires and the pictures were projected onto a white board from a power point presentation in my computer. I invited various kinds of people including students, professionals, makers, and researchers. Sketching papers and other stationery were made available on the workshop table.

The workshop was on June 13th 2013 from 17:00 to 19:00 at Medea. There were 7 participants besides myself and included: 3 students, 2 researchers, 1 permanent resident representation, and 1 professional maker. They had all participated in my empirical works at some points, which made their contribution more relevant to this project.

Firstly, I introduced the concept of creative-up-cycling, as an alternative way to reduce your waste instead of recycling. The need and benefits of the concepts were explained on the form of A3 papers and post-its, which were mapped on the white board. After that, the discussion started focusing on how to find materials.

The workshop aimed to provide insights by discussing:

(1)Foreseeing the potential use of the main concept and the 5-design ingredients as amateur users and professional users in the concept elements (2)Testing the core principle on each concept element (3)Designing together with concept elements as inspiration and building blocks.
Figure 33: the design workshop
7.2 The Concept Elements Outline

This section presents and elaborates the description of each concept element. The concept elements aimed to find and elaborate on possible service configurations. The concept elements of the *creative-up-cycling* concept are: Co-storage, The Mix and Match furniture shop, and Renovation and *up-cycling*.

Visuals and diagrams have been changed to contain details of a whole understanding and insight of concept elements. Concept elements were not implemented since the core concept had been implemented in several stages in the empirical studies. (see section 5.3)

To find the possible service suggestions the core principle of each concept element were presented with the feedback and evaluations from the design workshop and the participants in each of the following sections of the concept elements.

The outlines of each element are

- Concepts explanation outlines with illustrations of the real context that explain use and actions.
- Design and feedback from the design workshop.
- Connection to related works and what others have done and what elements that can be regarded as potentially relevant.
- A major service stage of each element is outlined with brief descriptions.

A reflection on each concept will also be further discussed in the contribution and final reflection chapter.
7.3 ‘Co-storage’ concept element

From visiting Hilda and the empirical works I learnt that there are potential opportunities regarding waste reduction management in the area. Co-storage could possibly be a concept element in Hilda community that local people could use.

The Design ingredients used: Leftover Materials and People

7.3.1 Overview

Co-storage is a swap concept, local residents can exchange or swap unwanted items by using co-storage as a platform. One person could leave unwanted items and another person could take them or give to someone in that local area.

In this way it mimics a scenario where unwanted materials or items are sold in a marketplace which is any space that connects people who have unwanted objects, and people who need spare parts. A marketplace in this way is an items sharing system where both a giver and a receiver gain mutual experience. A giver who gives an item can expect one day he or she can take another item back from someone.

Co-storage could be in any form as long as it has a space, protected from the weather and animals and it should be lockable like a container room, an attic, a boom shelter. These things make the items still have a good condition to be reused. Normally the lockable storage in Hilda is not open for public to use. However, Hilda community provides 4 unclosed containers in the center of the community for residents in order to throw away unwanted items. The containers cannot protect items from rain or animals such as rats.

The four recycling containers cost to Hilda community about 2000 sek each time for unloading materials to SYSAV (see section 2.1.1). The residents can throw away items, but they are not allowed to take away the items from the recycling containers. Through this practice one of the containers is transformed into a locked sharing container. However some residents have tried to find usable items in the containers although its not allowed. We (Samar, Anna and I) saw the potential of the materials that could be useful for the community in the future rather than recycling them. We also collected some of the good items and materials from the street close to containers.

7.3.1.1 How it works

The co-storage is put in the middle of the co-housing building area. Residents can use the same house key or their id cards to access the co-storage. In different times, co-habitants (see section 1.3.1) can leave and take unwanted or unused items especially big scale items like furniture. To exemplify it with Hilda, this housing cooperative have approximately 2000 households and each couple weeks they have 4 containers that are filled with unwanted items. I sketched one of 4 containers to be an up-cycling container, which it transforms to the co-storage concept.
The co-storage, figure 35, is available next to an *up-cycling* container, figure 34, and recycling-garbage rooms in the same area. This co-storage element is a sharing platform. This concept element aims to make people aware of *up-cycle* instead of recycle, and provides the opportunity for co-habitants to exchange items.

For maximum use, instead of paying SYSAV 2000 Sek the community could employ professional or amateur people in order to separate the usable materials for the community.

*Figure 34: The *up-cycling* container sketch before transform it to the locked co-storage concept.*
Figure 35: The co-storage concept element preferably locked co-storage.
7.3.1.2 The Value and The Connection with the Design Directions

This concept element is changing the way we store the unwanted items and the way we decide to own items. The inspiration of this concept was while visiting Hilda, where people use four opened containers, and a private locked storage. The value is presented in sections 7.3.1.3 and 7.3.1.4 below.

7.3.1.3 The Potential Pros

The various potentials are:

(1) Giving a meeting platform for residents. The co-storage does not only give a local space to handling the waste that you no longer need or want but it does offer a meeting point to the neighbors. I hope this would be an element that gathers them to start knowing each other via the sharing element.

(2) Inspiring of up-cycling waste manage for the neighborhood. When residents meet they might discuss the potential of the leftover items that they no longer use, which could inspire others.

(3) Providing a job opportunity in the community for sustaining the system. For the maximal use and the variety of unwanted items, the co-storage may need to be rearranged and managed, so this would open up an opportunity for a local resident to separate items legally (Transform money from paying SYSAV into hiring an expert materials person, manage person)

(4) Protecting items from a weather condition and animals with a locked co-storage. The co-storage can be locked from house keys or id cards, so the items inside the co-storage could be saved from the weather condition such as rain, snow, sun and animal such as rats.

(5) Reducing items that would go to landfill sites. There are some items that still have a good condition to reuse or remake by other local residents, but there were not much opportunities for local people to give them to others directly, so the co-storage is one of the platforms to collect those items waiting to be used again by a new local owner. Co-storage gives local people a place to leave unwanted items instead of transporting them into a public place or a landfill site.

(6) Having a material management system within Hilda community and outside the community. Co-storage could give the local community a connection to other communities or second hand shops outside Hilda because the items in the co-storage need to be managed in order to maximum use. The co-storage has a limitation of space so it
would be better if the community has some kind of material management to network and exchange items or materials outside Hilda. This not only makes local people unite but also provide a connection to other communities on *up-cycling* activities.

These values can connect to the design directions A and B below as follows:

**A: Supporting Creative-Up-Cycling and mutual sharing of experiences through connecting to and build upon service systems that already exist in society.**

In this concept element, a form of reciprocity of sharing items does not only reduce waste from the households but also diminish transaction costs, transportation costs of the exchanges either givers (owners) or receivers (customers) have to pay. Getting free furniture from blocket.se is one example; receivers have to transport furniture by themselves from owners no matter how far. It is often that owners give the objects for free because they do not need to transport it to SYSAV.

The sense of a face-to-face communication that this element provides is stimulating reciprocity (see section 1.10). Residents can give and take and spread the word.

**B: Create the embodied making experience from highlighting the process of making.**

Leftover materials is one of the 5-design ingredients that should be a starting point to inspire people to gain the embodied making experience. Imagine if you got a free table from the co-storage, you might need to repair or remix with other materials and decorate it. After these activities you will reuse it and feel more ownership instead of some body else’s items.

**7.3.1.4 The possible obstacles**

How does a community manage the limitation of the co-storage space in the long term?

The ways to unload, upload and store items from residents might cause muddle. The participants suggested having separate dates of unload and upload could solve this problem. (see section 2.5)

Some items might turn out to be unwanted and gradually fill up the container. Who will then take care of emptying the container?

**7.3.2 Design together and feedback**

The participants were concerned about the number, and the quality of the objects in the co-storage.

1. The area to put the co-storage: It could be that people within a residents area are uninterested in the items, but other people outside this area might be interested. Could
they then get access as well and in that case how? But on the other hand, Hilda residents probably do not want outsiders to come and sneak into their containers, however could some people who engage in up-cycling business services get permission to come and take items?

- If the participants raise a potential to leave the containers outside Hilda area, would the sense of local community be gone?

- The sense of donation that the objects are anonymously given and taken was interesting in the discussion because the concept was transformed from up-cycling opened containers to the sense of anonymous where scavengers could find things freely.

2. During the workshop someone expressed that a materials expert person, especially in materials like wood, metal and textile, could make more use of unwanted items. What kind of skills does the community need to hire in order to check the conditions of the leftover items in the co-storage? (a professional maker or a SID designer, a product designer, a furniture maker ?)

3. Most of the participants use social media, so they gave an idea on sharing leftover pictures on existing online platform. the unwanted items could be taken and shared for a possible owner to check these items online first to see them in real. Residents could use local existing networks such as local TV channels, or social media to promote unwanted items.

7.3.3 Related works
There are main service ideas that build on exchanging items or giving materials away like this co-storage concept element.

7.3.3.1 Camden.gov.uk
This online site promotes reusing unwanted items. With a swapping concept and a market place concept that match the needs between givers and receivers. The streetbank, freecycle, freegle and ecomodo are registered networks that collect unwanted furniture. (see section 2.4.6)

7.3.3.2 Marketplace platforms like Blocket.se, and eBay
These are online platforms for people to negotiate; you can find or sell or share cheap items or free items from these websites and you can also find more information on items.
7.3.3.3 The services for donation

The services for donation such as Emmaus, Myrorna and Erikshjälpen are NGO companies and they provide a convenient way to *up-cycling* things such that people know where their items will end up. They only accept small-scale items such as clothes, handbags etc.

Another example is Degoedzak or the good bag (see section 2.3.2). This is the principle of giving and taking anonymously and individually.

![Figure 36: The different donation boxes provided around Malmö](image)

7.3.4 Service flow

This is service system of the co-storage concept.

![Figure 37: The service system of leftover materials in Hilda community. Residents can leave and take unwanted items to the co-storage. They can exchange items on the spot, pink color area shows the possible exchanging space. Residents however might need to up-cycle some items before they reuse it. The community can manage this when the co-storage gets full. The](image)
community could provide a job opportunity for a local resident to manage these items. Hiring a person instead of paying to SYSAV. The 4 opened containers could transform into locked co-containers. The Items in the co-storage could be sold to second hand shops, donated to existing maker communities, and exchanged to other communities. The unwanted materials finally would go to SYSAV, but there would be a few items left.
7.4 ‘The Mix and Match Furniture shop’ concept element

The design ingredients used: Leftover Materials + Skills that have aesthetic aspect

7.4.1 Overview

The mix and match furniture shop is a place that could up-cycling furniture with aesthetics sense. The users are able to learn how to use tools and mash up their old furniture by having a professional maker who is specialize in mash up aesthetics advice them.

7.4.1.2 How it works

Imagine if you have furniture you no longer use or want but you do not have any skill to up-cycle it, ‘The mix and match furniture shop’ has a great deal for you.

The shop is a business place that provides a space and tools to any person who wants to up-cycle their old furniture to directly negotiate a surplus ratio with a professional furniture maker in order to mix and match and mash up the old furniture with aesthetic sense and unique style. The mix and match furniture shop business model is like a Cykelköket business model that provides tools, machines and skilled assistance for participants. You could mash up furniture by yourself as well as get some advice by professional furniture makers in the shop.

This could turn out to business partnerships where both an owner of old furniture and a skills person can share the profit of selling the furniture later or the owner of the old item can bring it back to home. Possible local marketing is done through social media like Facebook group, Twitter, Instragram or Pinterest.
7.4.1.3 The value and the connection with the design directions

The value on this concept element, mix and match furniture shop, based on a business level behind products is that the customers perceive to them as eco-efficient products in a unique style.

The unique of the final furniture especially regarding aesthetic qualities has added positive value. From this value it could motivate people to bring old furniture to the shop. Products from this shop would be unique because of re-making an unexpected artifact of old furniture. People receive not only the uniqueness of final products but also pay less.

Using existing materials is cheaper than finding an antique spare part, which it might cost even more expensive to up-cycle items.

The value of ownership has increased through the story of the item for example who was the previous owner, who is the professional furniture maker and who will be the new owner. There would be stories a long the way of making final creations. One obvious value of mix and match furniture shop is reciprocity that is not limited only when you are in a maker community but include a business model that provides mutual experience sharing as well as potentially sharing of profit.
Additionally, a professional furniture maker can mix and match items during his free time and he or she can also share the profit from the activities. The final furniture belongs to the owner of the old furniture.

**C: Spread the design opportunity towards DIY craft activities and the raise of Up-cycling sub culture in local communities.**

The uniqueness of the final furniture could help to promote the DIY craft activities towards ‘The mix and match furniture shop’, however up-cycling activities like this shop needs time to promote and be a part of a local community.

**A: Supporting Creative-Up-Cycling and mutual sharing of experiences through connecting to and build upon service systems that already exist in society.**

The platform of a shop can market per se to the residents, with the potential of promoting the activities inside the Mix and Match furniture shop. The shop also provides a space that users and professional makers can benefit the experience from others.

### 7.4.2 Design together and feedback

This business idea came from the design workshop, when we were discussing that not every body would like to spend time on making a thing. During this discussion, the expert person offered the deal to other participants who had items that they do not use anymore “how about you get 50% and I get 50% if I fix it and sell it”… “It is a great deal”.

### 7.4.3 Related works

The related works of this element is like an up-cycling product design company like Apokalyps Labotek (see section 2.2.2) that mash up second items to be a good design products. In addition, there is an NGO that provides a (library) space that bridges skills people or tools with the members of Garaget.

#### 7.4.3.1 Garaget

Garaget is located in the heart of Malmo city in the form of an open space and library. The activities in Garaget are diverse including borrowing books, borrowing tools and fixing your own cloth.

#### 7.4.3.2 The mash up furniture designer studios

Some companies like 5.5 design studio and Baas call themselves furniture makers as well because they mash up furniture from leftover items. Mix and match furniture can also continue to be the same kind of furniture with similar functions or they can get new
functions. For examples, ‘Le Fauteu’ of Sauvez Les Meubles in 2003 has been used in the same as previous function; versa ‘Hey chair’ is transformed into a bookshelf rather than another ordinary chair.

Figure 39: Le Fauteu, Sauvez Les Meubles, 2003 (www.5-5designstudio.com)

Figure 40: Hey chair, Baas (www.maastenbaas.com)

Figure 41: Multifunction mashed up furniture

7.4.4 Service flow

The following diagram shows the flow of benefits and communications. This also illustrates the business flow.

Figure 42: The Mix and Match Furniture shop. Residents bring unwanted furniture to the shop. Having a discussion with professional makers they mash up furniture together. They negotiate the direction of the final furniture with the form and functions. They also discuss whether the owners of old furniture would take it back home or sell it. The professional makers could share the profit if the furniture can be sold.
7.5 ‘Renovation and Up-Cycling’ concept element

The design ingredients used: Tools + Skills

7.5.1 Overview

A significant part of the housing stock in Sweden where built during the 60s and 70s and many of these houses have to be renovated. Hållbara Hilda is an example of a housing stock that had to be renovated. Normally a process like this is sub-contracted to external construction companies that get paid to do the work during a specific time span. During this process construction workers will come and put up some temporary containers that they can use as workshop facilities and where they can store their tools. This was also the case with Hilda. What if however, some of the workers were hired locally (something they are working on in the MIL-project that is coordinated by the city of Malmö) and what if they instead of putting up a temporary container that later would be removed, the first phase of the construction or renovation phase would be to build a small workshop space or house in the area that could be maintained and used by the residents after the renovation process was done?

7.5.1.2 How it works

The small workshop house provides tools for residents to renovate the house, but also work as a space where they can renovate furniture by themselves. The co-benefit is to use it for both professional makers (from renovation company) and amateur makers at the local site.

At first, the skills people from the company like a carpenter, a furniture maker should provide residents a lesson to use the tools and after that they could sustain the knowledge in the community.
7.5.1.3 The value and the connection with the design directions

The company can reduce the cost of transportation of a container to another construction site as well as it could support skill-development in the local area. Residents can learn how to renovate and fix their own house and own furniture at the same time. Understanding about doing renovation however leads to the proper use of the objects. This obviously shows sharing opportunities on Tools, Skill and People, and they are a kind of reciprocity per se. The location of a small workshop house is highly visible in the community. This may give an advantage on promoting the up-cycling subculture without any promoting cost.

A: Supporting Creative-Up-Cycling and mutual sharing of experiences through connecting to and build upon service systems that already exist in society.

This concept is like an open workshop for the local residents and it could potentially connect with other existing up-cycling service system in society.

7.5.2 Design together and feedback

Because of time constraints, the participants of this design workshop did not have much time to discuss the concept element. One thing that was discussed was that, if local people could develop and maintain renovations skills they could then become valuable for fixing things in the area in the future.
7.5.3 Related works

The related works of the same system of the small workshop house concept are various. One good example in collaborative services project is called “Open Handy shop”. This shop provides space for DIY use, including tools and hardware materials. Users can get advice from the shop owner.

Another example is called “Wood atelier”. The wood atelier allows gradual access to a professional carpenter that could meet the personal needs and could take into consideration the skill level of each user. Wood atelier also provides a space in workshop where people can benefit the experience from each other.

7.5.4 Service flow

![Diagram](image)

Figure 44: Renovation service system. The workers and local residents share the tools in the area. Using the small workshop house to share the tools and skills. Local residents could also be inspired from Pinterest, Houzz, and Sketchup websites, etc. The community could maintain this small workshop house by renting it from the renovation company.
Chapter 8: Final reflection and knowledge contribution

8.1 Final Reflection

This thesis project has explored design principles comprising of 5-design ingredients that open design opportunities (concept elements) for the domain of creative-up-cycling. The empirical studies included culture probe and various maker workshops which were all extremely important elements for examining the value and understanding the experience of mutual learning, reciprocity, and ownership as applied to creative-up-cycling. The three final concept elements: ‘Co-storage’, ‘Mix and match furniture shop’, and ‘Renovation and up-cycling’ have provided suggestions for possible future practices on the community-based level.

8.2 Research Question Answered

Research Question 1

How can design promote sustainable awareness via leftover items or materials in local communities towards the DIY maker culture approach for making a thing?

The empirical studies have shown the way designers or makers conduct workshops in order to make things (see section 4.7, 5.3, and 5.4 in the preparation). The design process has shown the importance of making, thinking and preparing. These activities are creating the foundation for how makers learn how to make things by hands.

In this project, the design process became a major part of promoting sustainable awareness by designing with leftover materials. Some examples are the use of materials in the workshop like; a recyclable tablecloth in the maker culture workshop (see section 4.2), pallets to make a bench, and leftover textile to make a bunny pot.

Designing new tools was another way how design promoted up-cycling activities: designing gardening tools for reaching apples on the apple tree (see section 4.7) can inspire people to use household objects to make new tools themselves. Drawing origami folding process algorithm chart (see section 5.4) can help participants understand the process of folding. Designing a tool to stick the pallet wood pieces together (see section 5.3) can be inspiring when making a thing from pallet etc.
The creations in the workshop can promote awareness such as the bag from leftover textile material that I made in the textile department has been an inspiration to other makers. They sometimes asked and watched how I did the bag.

Research Question 2

How can we design for sustainable up-cycling activities on a community-based level that use materials that we no longer use, but own?

To sustain creative-up-cycling activities, I explored the 5-design ingredients: Leftover materials, Tools, Skills, Space and People. From these 5 ingredients I also developed three concepts elements: ‘Co-storage’, ‘Mix and match furniture shop’ and ‘Renovation and up-cycling’, where each element is a part of up-cycling activities. All the concept elements have potential aspects that could be embedded into new local practices to support sustainable up-cycling in the future (see chapter 7).

8.3 Knowledge Contribution

8.3.1 Knowledge Contribution to Interaction Design

My knowledge contribution is especially valuable for the interaction design community that is engaged in sustainability issues. As Blevis claims, sustainability should be a main focus of interaction design, he calls this perspective “Sustainable Interaction Design (SID)” (Blevis 2007). Stegall also points out the role sustainable interaction designers should practice in developing a sustainable society, which is to “not simply create sustainable products but rather to envision products, processes and services that encourage widespread sustainable behavior” (Stegall 2006, p.57). The value of my work to IXD consists of two parts, (1) I have contributed to a repertoire of service design concept elements that could support creative-up-cycling and (2) I have shown how different established methods within interaction design could be combined to explore opportunities for creative-up-cycling.

The empirical studies I have conducted show that there is potential for setting up a service system for creative-up-cycling where dedicated maker culture groups can be connected to ordinary local neighborhoods and also shows how these two groups could contribute to each other. The contribution from each other in this thesis means to share the five design ingredients that I have explored for up-cycling activities: Materials, Skills,
Space, Tools and People in a local context. These ingredients could bring about possibilities for services systems, also discussed in this paper (see chapter 6). The repertoire of the three concepts elements: ‘Co-storage’, ‘Mix and match furniture shop’, and ‘Renovation and up-cycling’, could support the up-cycling activities and it is even a catalyst for individuals to make things by DIY. These concept elements have not been experimented, albeit, these seem to reshape the waste handling behavior in the local area. The common area that residents usually use could create more or alter functionality including sustainable issues.

However the concept of up-cycling could have a weak point about how to deal with complicated products that were not designed to be remade for after use. The items like leftover electronic parts or cheap materials sometimes could not simply up-cycle them, so as this works focused on materials that could potentially up-cycle such as leftover pallets, papers or textiles. These materials however were not designed because of unpredictable of the previous used. In order to effect change people need to change their mindset towards more up-cycling activities and interaction designers should design products that can disassemble in the cradle stage (McDonough et al. 2009).

As mentioned, not every kind of products can simply be up-cycled in the end. Electronics are a good example such that it can be up-cycled to a new version of software in a period of time, however, the complicated hardware might not be easy to up-cycle. The concept of rebuilding as a jigsaw game could help designers to design a future product that could do reassemble after its useful time.

The technology might force people to do things even more convenient. On the contrary the social innovation in this thesis could open some opportunities for residents to have a new practice on a daily basis for handling waste. Their behavior could shape the development of technology or service system (Thackara 2005, Tim Brown et al 2010) for sorting their waste in different ways especially supporting up-cycling activities.

From a methodological perspective my contributions consist of showing how participatory design could be used to build relations between maker-cultures and local resident communities that are interested in sustainability. Participatory design moreover provided me as the designer open-ended ideas on sustainability issues that emphasize up-cycling activities.

I have also demonstrated an insider perspective, where I have been emerged in and learned from within a maker culture, that could contribute to a better understanding of opportunities in up-cycling activities. The different roles I played as the designer in the design works have demonstrated how to engage local people and integrate oneself into a
maker-culture. It is a better way to connect makers from an individual level to a local community level. Making a thing in a community level context also could be made a peer pressure experience to drive individuals and it could maintain the maker activities in a long-term.

This local context in this project could magnify to be useful for further apply and develop up-cycling activities in the local context itself. Another useful of studying local context is to develop technology for the waste handling system, and materials management for the future practice. Interaction designers should also concern themselves with the setting of their projects (specific place) in order to fit their projects into the local activities.

8.3.1.1 The Positions

First of all, the role of the designer in this project has been shifted from designing tangible objects (products-oriented) that I am familiar with to design for something as a service (time-oriented). For me it has been a new experience not having a physical object as the final design.

Through practicing sustainable interaction design (SID) I also adopted a role that could see the design process as a tool to enhance and spread sustainable social behavior that potentially also could influence and get transferred to a sustainable society.

To elicit the information naturally from the participants in the research settings, e.g. the textile departments, and several workshops that I had conducted (see chapter 4), I had acted in various roles where I sometimes was not familiar with the situations, however this gave me different perspectives from the general designer’s view. By acting as a participant in the maker workshop for example gave me the view of an amateur maker, but having the role as an instructor in the design workshop provided me a more expected role.

Even if shifting the roles of the designers sometimes creates confusion and uncertainty it is a necessary condition for opening up the design space. I suggest that design researchers should have a clear view about the main position before doing any empirical research, but be open minded for any interesting opportunities that may emerge.

8.3.2 Knowledge Contribution to Maker Culture

The knowledge contribution of this project could be briefly reported through several perspectives.

The exploration of sustainable interaction design through the creative-up-cycling DIY maker culture were valuable for the local communities. By engaging in local creative-up-
cycling they do not only get new objects from old ones, they can learn new skills and they get the opportunity to imagine new ways of living. Creative-up-cycling also promotes new ways for how the community could be developed further, both through the social connections that emerge within that local community, but also by developing connections with other stakeholders that are engaged in up-cycling (e.g. Cykelköket in chapter 4). These emerging networks support maker-culture on different levels and on different sites. As we have seen during the design process, external stakeholders engaged in making (Cykelköket) can come to Hilda, but Hilda residents can also come to STPLN (see section 5.4). As mentioned a waste handling management in Malmö, local residents need to separate daily waste and other waste. There are potentially that both local residents’ communities managed waste to up-cycle activities. The maker culture however can promote and combine the up-cycling and recycling activities (see chapter 2) into local communities.

My main knowledge contribution consists of; the main concept of Creative-Up-Cycling, the 5-design ingredients, the design principle (see chapter 6) and the concept elements of ‘Co-storage’, ‘Mix and Match furniture shop’, and ‘Renovation and up-cycling’ concept elements. Each concept element has shown that they could support possible future practice for waste handling and it contributed to promote a sustainable lifestyle.

8.3.2.1 Time Factor

Working with people in this collaborative project was difficult regarding the time frame in order to conduct workshops because different people schedules had to work together. To be able to produce relevant knowledge it was necessary to include people from Hilda, the students’ accommodation, expertise makers’ communities, and research people to develop and refine the concept elements.

As a designer of this research project, a flexible schedule was needed for making appointments with the participants. Additionally, working on a community-based level was a new experience for me, where I also needed to make the opportunity and time to deal with the complexities that I encountered in the communities. However, during the entire project the planning had to be flexible and I had to re-plan constantly depending on what I encountered and set up the projects in an open-ended approach (I made the process graph in the middle of the project when the project’s direction was clear).

8.3.2.2 The Culture

Culture in general is a social condition that mainly has an influence on the design process of making a thing. Since the project was involved in several maker communities as well
as in the residents’ community, the different cultures that makers reflected on through their handmade embodied objects were interesting. All the empirical works that I conducted were intertwined with local culture like having Fika for example. Especially when I did ethnography, sometimes the research materials were in Swedish, even though it affected the time span by added effort to find someone to translate the research materials, but it was worth the effort and raised my curiosity.

### 8.3.2.3 The Combination of Recycling and Up-Cycling

To promote a sustainable society I learnt that residents need to practice both recycling and *up-cycling*. Maker culture could promote these behaviors to some point.

I also found that even though an item could be completely recycled there are usually still some elements in it that are harmful to the environment. To express it differently, if you *up-cycle* it in a wrong way it might cause a bad result for waste disposal in the end of use as well. Both recycling and *up-cycling* activities cannot be separated sometimes. It however makes no sense to find the exact ratio of the combination between recycle and *up-cycle* in one community, local residents need to observe and research this themselves as well as develop practices of possible future behavior that could work for a longer period of time.
8.4 Future Work

There are several angles from which this project could be further explored.

8.4.1 The Possible Consequences

Framing this project in a larger context beyond local communities can give rise to some reflections and insights including the following:

*Collapsing of the Economy*

What if everyone became a sustainability activist or supporter? While that would make sustainability a more popular fight world wide, in extreme measures it would however mean that we would no longer consume original items from the industry since we would all recreate, mix and match or mash up items by ourselves. The world would slow down in industrial growth and eventually no longer accept new heavy productions. We would spend less money to live and it might collapse the economy. Vice versa, if the global economy would collapse then *Creative-Up-Cycling* might be a very valuable approach to continue development and promote a local sustainable lifestyle.

*Acquiring new Kinds of Expertise (social angle)*

What if many more people than today would be concerned with *up-cycling* instead of recycling, and try to connect *up-cycling* activities through the DIY maker approach? In this case, the job market would require new kinds of expertise like an eco-maker, an eco-material expert, etc.

*Balancing Waste Handling Policies*

If the combinations of *up-cycle* and recycle had been shifted, the increasing of *up-cycling* behaviors would change the way people live in the society today. Some recycling (cradle to grave) policies might transform to be more supporting of *up-cycling* (cradle to cradle) activities.

8.4.2 Further exploration

Further exploration of these concept elements is needed for refinement. In order to refine the concept elements participants should still be the crucial elements of this project. However gathering the different kind of professional participants together was difficult during this project time frame. In a community-based level project designers and residents should have a specific period of time to work. The best way for collaboration in this kind of project is to introduce your self to local residents before starting the project.
This project was conducted within a societal structure with very developed waste management systems. It would be interesting to apply and explore these ideas in an underdeveloped country that does not have any good waste handling reduction management.
Conclusion

While a lot of material objects are re-cycled on a system level in the city of Malmö, this project focused on exploring how local *up-cycling* could be an alternative practice to support sustainability. Through an open-ended design process I have explored how maker-cultures could be connected to and influence residents to live more sustainably in local neighborhoods in the city of Malmö. The processes have shown several opportunities for *creative-up-cycling* in these areas. Specifically I have explored how furniture could be combined and *up-cycled* into new items. This project then introduces a main concept of *creative-up-cycling* by presenting supporting design principles, focusing on a local community, discussing 5-design ingredients (materials, tools, skills, space, people) and proposing the concept elements of ‘Co-storage’, ‘Mix and match furniture shop’, and ‘Renovation and *up-cycling*’. The value of this goes beyond producing new objects from old ones. This processes supports skills sharing, creation of stronger contacts within the community and also between one community and other external maker-cultures. This facilitates further how the practices and mindsets of more dedicated maker-communities slowly could influence local citizens and potentially also create a mind shift, a new perspective on how citizens could deal with their material world.
References


Buxton, W. 2007, Sketching user experiences: getting the design right and the right design, Elsevier/Morgan Kaufmann, Boston.


Ehn, P., Björgvinsson, E., Hillgren, P., Malmö University & Faculty of Culture and Society 2010, Participatory design and “democratizing innovation”, ACM.

Eriksen, M.A. 2012, Material matters in co-designing: formatting & staging with participating material en co-design projects, events & situations, Faculty of Culture and Society, Malmö University.


Gauntlett, D. 2011, Making is connecting: the social meaning of creativity, from DIY and knitting to YouTube and Web 2.0, Polity, Cambridge.


Halse, J., Brandt, E., Clark, B., and Binder, T(.eds.) ,. 2010 Rehearsing the Future. The Danish Design School Press


Jegou, F., Manzini, E., et al.,2008. Collaborative Services: Social innovation and design for sustainability: Creative Commons The full licence: http://creativecommons.org/licenses/by-nc-nd/2.5/legalcode


McDonough, W. and Braungart, M., 2009, Cradle to Cradle; Remake the way we make things. UK: Vintage.

Meroni, A. 2011, Design for services, Gower.

Meroni, A. 2007, Creative communities: People inventing sustainable ways of living, Creative Commons.

Moggridge, B. 2006, Designing Interactions, MIT Press.


Seravalli, A. 2013, Prototyping for opening production: from designing for to designing in the making together, 10th European Academy of Design Conference - Crafting the Future, pp 1-17

Schön, D.A. 1992, Design as reflective conversation with the materials of a design situation, vol. 5, No. 1, March 1992, pp. 3-14


Statistic Quoted, 2002. *Driving innovation through the public procurement.*

http://surveys.peerproduction.net/2012/07/mapping-hackers-diy-community-survey-2012-results/


