



GÖTEBORGS UNIVERSITET  
STENEBY KONSTHANTVERK OCH DESIGN

## Lifecycles

### An exploration in sustainable design

Adrian Coen

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Examinator: Mats Alden

Opponent: Matti Klenell

Opponent:

Handledare: Kalle Nuskowski

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## Introduction

Italian designer Achille Castiglioni stated in 1992 that 'A design stems from the urge to create a rapport with the unknown user who will use the object'<sup>1</sup>. In my exam project I want to look into the sustainability of this rapport or relationship between the user and their object. 'Rapport', (from the French word rapporter, meaning 'to bring back') is defined as 'connection', 'harmonious or sympathetic relation', 'relationship, especially one of mutual trust or emotional affinity', 'togetherness', 'intense harmonious accord', 'attachment', 'understanding' and 'confidence'<sup>2</sup>. This quote is very useful in understanding the nature of a sustainable and durable relationship between the consumer and their material possessions. If a functional object can do it's assigned task well, serve its purpose, perform and please its owner over time, perhaps it stands the best chance of being kept, cherished, and lasting the distance.

My examwork could be seen as a two part investigation. I'm looking into the potential of waste and salvaged woods and discarded furniture, and how I can find a valid use for this material in a second life. I also want to look at how a designer can influence or create an emotionally durable relationship between the user/owner and the object, that will ultimately prolong its lifecycle.

This project has a lot of personal relevance for me as it's also an opportunity to explore the potential in an idea for an 'up-cycling' design/workshop. A business vision founded on sustainable design principles, is something I hope to pursue after completing my education.

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1 Miller, J., Castiglioni Brothers, from Furniture World Styles, p.489  
2 <http://dictionary.reference.com/browse/rapport>

## Background

I decided on my subject area after being inspired by our Autumn 'Upcycle' and sustainable design projects, and wanted the opportunity to explore these issues in depth. I have been asking myself what and how I will design in the coming future, and how will my furniture say anything about 'the times and conditions that have given rise to it.'<sup>1</sup> In *The Green Imperative*, Victor Papanek writes on design; 'We no longer ask, "How does it look?" or "How does it work?" We are more interested now in "How does it relate?"'<sup>2</sup> I want to design and create an object in the exam work that somehow reflects or relates to the current ecological crisis we're in.

## Sustainability

What is sustainability? It is a very diverse social, political, cultural and environmental debate about how we live and use material and natural resources. Author Jonathan Chapman, senior lecturer at Brighton University, writes 'Sustainable design is not a set of neatly arranged and pre-defined formula or legislation-driven principles, but a critical and provocative debate surrounding the way we intend to live with this fragile Earth'.<sup>3</sup> It is no new debate – there have been questions about the way we use natural resources in the manufacture of material culture since the Industrial Revolution. According to author and industrial design professor Stuart Walker, it 'is a vast subject that we have barely begun to tackle and so it would be unwise to attempt a definitive solution to what is in reality an embryonic and volatile area of human endeavor'.<sup>4</sup> Sustainable design can be seen then as a very vital and important response to a real man-made environmental crisis of a global scale.

There is a growing societal awareness today of the problems around resource depletion, toxic pollution of air, water and soil, accelerating deforestation, biodiversity destruction, ozone depletion, global warming and climate change. There is also the mounting problem of waste and what do we do with it? There are also other issues that fall under the sustainability 'umbrella'; the disintegration of local culture, devaluation of material culture, and the loss of human happiness and well-being.

In *Emotionally Durable Design* written in 2005, Jonathan Chapman raises the question between resource depletion and a world population growing at a staggering rate. 'Over the last 50 years, the world's population doubled...but our resource utilization has increased by 1000% for the same period. These statistics demonstrate that increased population is not necessarily exponential with increased resource consumption, as is often assumed.'<sup>5</sup> He identifies the developed world's modes of production, consumption and waste as the real problem, not population growth. 'Today's prevailing industrial model has a tendency to perceive production as a linear process of resource extraction, manufacture and sales, with little or no consideration given to events that occur afterwards.'<sup>6</sup> In design terms, the landfill is an afterthought or accident. Perhaps it was never a thought at all.

The problem may be how we relate to, or perceive our natural environment. Resources, which Chapman describes as what 'we like to call matter for which we have a commercial use'<sup>7</sup>, are being used as if we had an infinite supply. A tree is seen as a 'resource', not a living organism in a rich complex ecosystem which we're dependant on and a part of. Cradle to Cradle authors

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1 Papanek, V., *Design for the Real World*, 1974, p.25

2 Papanek, V., *The Green Imperative*, 1995, p.7

3 Chapman, J., *Emotionally Durable Design*, 2005, p.166

4 Walker, S., *Sustainable by Design, Explorations in Theory and Practice*, 2006, p. 3

5 Chapman, J., *Emotionally Durable Design*, 2005, p.3

6 *Emotionally Durable Design*, 2005, p.176

7 *Emotionally Durable Design*, 2005, p.5

Michael Braungart and William McDonough also question our current model of fossil-fuel based manufacture and industrial growth, taking resources out of the ground which are then ‘concentrated, altered, and synthesized into vast quantities of material that cannot be safely returned to the soil.’<sup>1</sup> This linear system is a ‘cradle to grave’ system that is outmoded and no longer valid or sustainable. It produces ‘unintelligent’ and ‘crude products... that are not designed particularly for human and ecological health.’<sup>2</sup>

Waste is the result of an inefficient consumption/manufacture model. The landfill according to Braungart and McDonough contains ‘billions of dollars worth of material assets’<sup>3</sup>, as the objects that end up there were made out of once valuable harvested material and cost money to transform and manufacture into products. They ask the question about a design-to-throw-away culture, ‘but where is “away”? Of course “away” does not really exist. “Away” has gone away’.<sup>4</sup> Environmentally responsible thinking such as this, is a direct opposite standpoint to the American retail analyst Victor Lebow, who was quoted as saying in 1948; ‘we need things consumed, burned up, worn out, replaced and discarded at an ever increasing rate’.<sup>5</sup> Lebow’s comment was seen in its day as progressive and inspirational in how to get the post-war US economy up and running again. We live in a very different world today.

Braungart and McDonough propose a ‘cradle to cradle’ system that imitates natural systems where waste becomes food for new life. The ‘waste’ is designed into the product which will then determine its next life; ‘the valuable nutrients contained in the materials shape and determine design: form follows evolution, not just function.’<sup>6</sup>

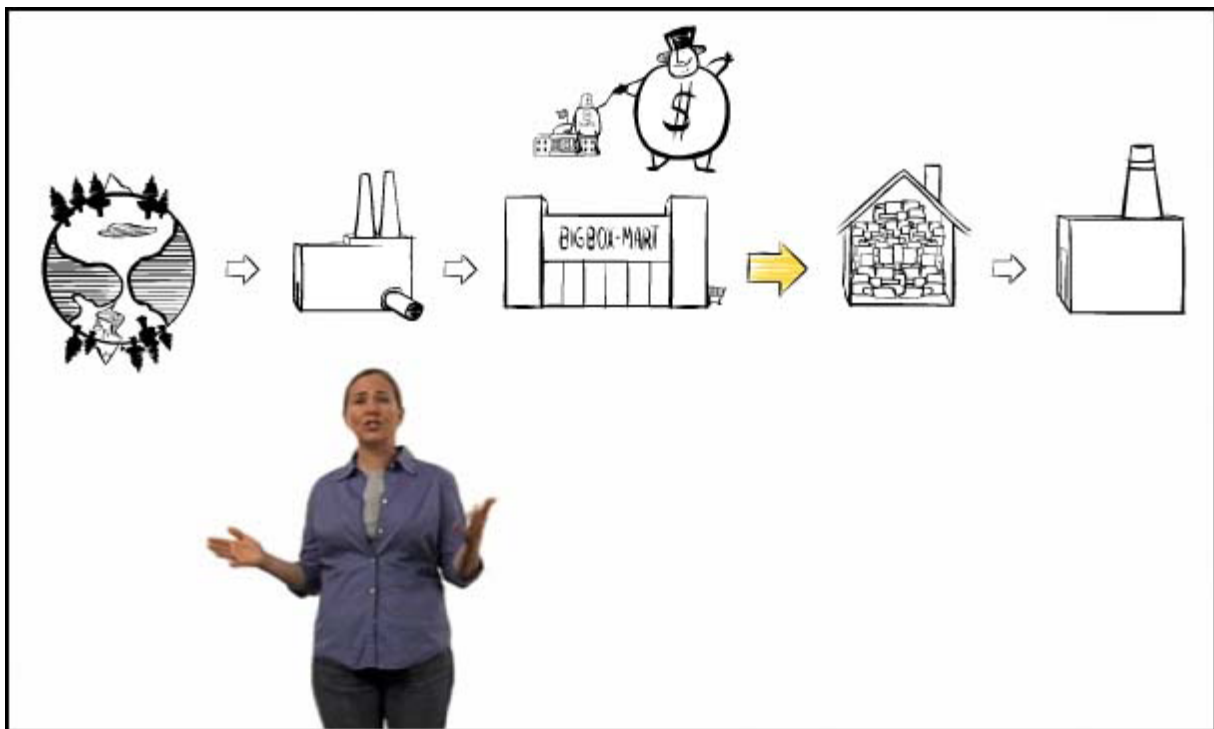


fig.1 Annie Leonard demonstrates a linear manufacture-consumption model similar to a ‘cradle to grave’ system in the short film *The Story of Stuff*.

1 Braungart, M. and McDonough, W., *Cradle to Cradle*, 2009, p.92  
 2 *Cradle to Cradle*, p.37  
 3 *Cradle to Cradle*, p. 27  
 4 *Cradle to Cradle*, p.27-28  
 5 Lebow, V., in Porritt, J., *Foreward*, in Grant, J., *The Green Marketing Manifesto*, P.10  
 6 *Cradle to Cradle*, 2009, p.104

## Consumer psychology

Any manufacturing system is directly related to how and why we 'consume' objects, and the psychology behind the user-object relationship is critical to an understanding of sustainable design. According to Chapman, 'sustainable design is most certainly unresolved and must continue to delve deeper still to the very root of human consciousness, as this is exactly where both the problems and the solutions lie'.<sup>1</sup>

Braungart and McDonough write on the curious and fascinating phenomenon of making something uniquely yours. 'We enjoy the idea of ourselves as powerful, unique individuals, and we like to buy things that are brand new. Opening a product is a kind of metaphorical defloration: "this virgin product is mine, for the very first time, when I am finished with it (special unique person that I am), everyone is.'<sup>2</sup> Jonathan Chapman describes consumption as 'a process in which we attempt to know, familiarize and ultimately outgrow the wonders of artifacts'.<sup>3</sup> We want to 'de-mystify'<sup>4</sup> and get to the end of the product – we have a desire to understand fully the essence of objects.

In *The Language of Things*, Deyan Sudjic, director of London's Design Museum, writes about the collection of objects as an existential process. 'It might also be an attempt to defy the threat of mortality. To collect a sequence of objects is for a moment at least to have imposed some sense of order on a universe that doesn't have any. Objects are the way in which we measure out the passing of our lives. They are what we use to define ourselves, to signal who we are, and who we are not.'<sup>5</sup>

Consuming then is an essential part of human nature. We consume to express and reinforce our individual identity, to prove we are different from society. In this way the objects we collect are self-reflective. Material possessions 'provide symbols of identity to their users and the people around them'<sup>6</sup>, according to Chapman, they 'become concrete manifestations of our personal biography', reminding us of 'who we are, where we are, our activities, our history and our future.'<sup>7</sup> We become attached to objects because of the memories we associate with, and build around them.

In the same way, owning beautiful things somehow makes us beautiful. They can give us feelings of pride. Objects are a way to measure wealth and social status. Chapman notes that 'Since the first person dissected one smooth stone into two sharp-edged cutting tools, we have been mesmerized by objects that signify characteristics of human brilliance, affording elevated social status to individuals in possession of such artifacts.'<sup>8</sup>

Waste, unfortunately, is an integral part of consumption as we know it. Being an unstable complex entity, the human being is ever evolving, growing and developing, but our material objects are fixed or 'frozen in time'.<sup>9</sup> Chapman points to the problem of pursuing meaning through objects while our ideals change. The consumer always desires an 'accurate reflection of a continually evolving self'<sup>10</sup>, but our material possessions can't evolve with us. Waste or disposal is an inevitable consequence in the breakdown of the user-object relationship. The product/object fails to keep up with the consumer's sense of self, and loses its value as it is no longer able to self-reflect who its owner is becoming. Doctorate research into product attachment by Ruth Mugge of Delft University of Technology in 2007, showed that consumers chose products with personality similar to their own.<sup>11</sup> A product considered trendy or in fashion, will easily go out-of-date, and owning an old-fashioned product may make the owner feel old-fashioned. According to Mugge, 'evaluation of the product as old-fashioned will decline the product's value for maintaining a positive view of the

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1 Chapman, J., *Emotionally Durable Design*, 2005, p. 174

2 Cradle to Cradle, 2009, p.102

3 *Emotionally Durable Design*, 2005, p.48

4 *ibid*

5 Sudjic, D., *The Language of Things*, 2008, p.23

6 *Emotionally Durable Design*, 2005, p.182-182

7 *ibid*

8 *Emotionally Durable Design*, p.11

9 *Emotionally Durable Design*, p.26

10 *Emotionally Durable Design*, p.120

11 Mugge, R., *Why do people become attached to their products?* Essay from website <http://www.icsid.org/feature/current/articles563.htm> (20-3-10)

self, resulting in early detachment and a premature replacement of the product.<sup>1</sup> This may explain why waste and the disposal of products has become such an environmental problem, particularly in the latter half of the 20th century. If 'consuming' is seen as an ongoing process or experience that doesn't just stop at the point of sale, it might also explain the need for a more long-term durable relationship between consumers and their material possessions.

## **Purpose**

This project gives me the opportunity to explore issues at the heart of sustainable design thinking. I want to achieve a valid re-use of waste and salvaged wood and discarded furniture – to find a suitable use for this material that can in some way reappraise it and give it a new value. I want to explore also the relationship between the object and user/owner and how much a designer can influence or contribute to the sustainability of this relationship. I aim to achieve a fully functional prototype to test these issues.

In making a fully functional prototype in a batch run production, I can also test the feasibility and potential of the idea for a small workshop.



## **Problem Formulation/Description**

In my PM, I used the following problem questions;

- How will I work with the material, how much can I physically alter it, re-shape it? What is the potential – strengths and qualities – in the existing dimensions, forms, shapes, surfaces and textures, colours, wood species, solid or board material? How can I celebrate this material?
- If I use the material as a starting point for the design process, will it suggest appropriate function and use, giving the project a direction? Can I find a need/use where these materials will be the right choice in the solution? (Material honesty). How will this function be relevant for today and the future?
- How can the object be playful, give delight and pleasure, celebrate human expression, thereby establishing an emotional connection with the user(s)? How can it form a meaningful relationship that will preserve the objects lifecycle?
- Should we recycle wood at all?

New questions have arisen since I started the project;

- How much can a designer influence the relationship between object and user? Is it possible to create product attachment?

## Method and Discussion of Methods

I decided to look at what other designers/makers have done in the field of sustainable design to see what I could learn from how they work with material, and what they have achieved. Though zero ecological footprint sounds like the ultimate sustainable design goal, the problems and issues are much more complex than that.

I looked at vernacular traditions in building, architecture and craft to see what could be gained from precedents for sustainable ways of life in the past. Traditional cultures all used local resources and materials, crafted and manufactured locally for local people. They are an example of efficient use of material, fitness for purpose, innovation and a 'built to last' philosophy. They are based on a sustainable relationship with the local environment. Natural materials that biodegrade have minimal impact on the environment. They are almost always a renewable resource. Communities depended on the availability of these resources for survival needs and so looked after them. What I learnt here, is that locally sourced material gave objects created by local people that answered local needs.



*fig. 2 plastic bottle top door curtain, South Africa*



*fig. 3 tin can briefcase, Senegal*

I looked into the use of waste in the developing world, where we can often see examples of the proverb 'necessity is the mother of invention'. Waste is seen a potential source for new objects. In fig.2 plastic bottle caps are used to create a door curtain. In fig. 3 tin cans are recycled into a briefcase. These items can also be seen as more than just born out of necessity - they are quite playful in their celebration of material. The small container in fig. 4 is an example of the genius of human expression. Made in Vietnam, from rolled up magazine pages folded over and glued together in laminated spirals, it's a beautiful form for holding small items. It's an innovative and creative use of waste material which is not immediately obvious at first. The haphazard use of bright colours, flowing rhythm and line gives the object an emotional charge.



*fig. 4 Recycled magazine paper container, Vietnam*

## Sustainable design strategies

I decided to research current sustainable design theory to get an understanding of the major issues and a solid foundation in this subject area. This research also proved insightful, however, in discovering different sustainable design strategies and approaches, which I'll discuss below, and which I used to start the design process.

- 'Dymaxion' is a term coined by the American architect Richard Buckminster Fuller, for products that gave maximum human benefit from minimal use of materials and energy.<sup>1</sup> Victor Papanek also felt that design 'must dedicate itself to nature's principle of least effort, in other words, minimum inventory for maximum diversity...or, doing the most with the least.'<sup>2</sup> In sustainable design terms, it makes sense to achieve the most efficient use of material. Papanek's proposal for a tin can radio for Indonesia (fig. 5) makes use of waste juice tins. The radio is powered by a candle or cow dung. Papanek hoped that by not decorating it, 'the local people would embellish their personal radio in their own distinctive way and thus participate in the design'.<sup>3</sup>



fig. 5 Papanek's tin-can radio

- Product personalization – the end user is allowed greater input and participation as an active decision maker in the design/make process, as opposed to a passive consumer receiving a 'fixed' pre-determined design. In Ruth Mugge's PhD research into product attachment, product personalization was one method where a consumer became attached to a customized object. 'Based on our findings, we conclude that the more a person is involved in the design process and can act as the co-designer of his/her own product, the more effort (s)he will invest in the product, and the more self expressive the product is likely to become.'<sup>4</sup> Mugge points to the example of Freitag, a Swiss company that make bags customizable via the internet. The bags are made from 'well-travelled truck tarpaulins, unraveled seat belts, bicycle inner tubes beyond repair, recycled airbags.'<sup>5</sup> The customer designs their own bag, chooses a piece of canvas and locates in the bag side using a template on the Freitag website. Each product is then uniquely theirs, as no two bags can be the same.

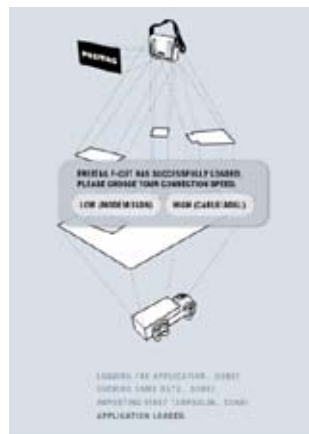


fig. 6 Freitag webpage

1 Fuad-Luke, A., *The Eco-Design Handbook*, Thames and Hudson, London, 2002, p.9-10  
2 Papanek, V., *Design for the Real World*, 1974, p.287  
3 Papanek, V., *The Green Imperative*, 1995, p.142  
4 Mugge, R., *Why do people become attached to their products?* Essay from website; <http://www.icsid.org/feature/current/articles563.htm>  
5 [http://www.freitag.ch/shop/FREITAG/page/fcut\\_page/detail.jsf](http://www.freitag.ch/shop/FREITAG/page/fcut_page/detail.jsf) (10-04-10)

- Design for disassembly – components that can easily be taken apart for re-use or recycling (if composed of mono-materials), or an object that can be reconfigured or changed. Can an object be designed to change, transform and adapt to changing user needs? Werner Aisslinger's Plus Unit made by Magis (fig. 7), is an example of a drawer unit system that breaks down and changes depending on different requirements. They are stackable and linked together with an aluminum butterfly key, allowing for a large number of possibilities.<sup>1</sup>



fig. 7 Werner Aisslinger's Plus Unit

- Author Jonathan Chapman, in Emotionally Durable Design, suggests that a product should behave in some way like a work of art<sup>2</sup>, with layers of meaning, ambiguity, allure, mystery and enchantment. The object never gives away all its meaning, so the consumer never gets to the end of it, gets to know it completely, and subsequently never gets bored with it. Could there be random discoveries and surprises, so that the object slowly reveals its secrets over time?<sup>3</sup> Fredrik Färg's Modus:cover cupboards (fig. 8) are perhaps an example of furniture working on this level. The cupboards use fashion magazines as a glued-on collage that is then dark stained and clear laquered over. The magazines date the furniture to the time it was made, in the same way to renovating an old house and finding a newspaper in the wall that dates the time of construction.<sup>4</sup> Chapman suggests that an object or product should contain an element of mystery and intrigue. There could be hidden layers that don't reveal themselves - the piece of furniture can have a secret 'up its sleeve'<sup>5</sup>. The cupboard has a secret compartment that contains the original magazine. The surface plays with concealing and revealing at the same time. Will this create an ongoing relationship that continues this 'dance' between user and object, this wanting to know (owner) and not revealing itself but giving a little (object)? Eric Chambert's 1943 cabinet entitled 'Livets vågskål' (fig.9), is perhaps also meant as an object of contemplation, and we search the marquetry imagery for its meaning.



fig.8 Fredrik Färg's Modus:cover cupboards



fig. 9 Eric Chambert 1943 Cabinet

1 <http://www.architonic.com/pmsht/plus-unit-magis-spa/1027953> (20-04-10)  
 2 Emotionally Durable Design, p.20  
 3 Emotionally Durable Design, p.55, 56  
 4 <http://www.fredrikfarg.com/> (14-04-10)  
 5 Emotionally Durable Design, p.144-145

- Emphasize the 'story-telling' ability of an object. Chapman argues that an 'object's gestalt aesthetic' should speak of where and how it was made. This is something he feels is missing in contemporary products, which he calls 'the narrative experience'<sup>1</sup>. Surface and patina will always show signs of age, wear and tear, and in the end become imperfect. Bumps, scratches, dents, knocks, scars are unavoidable, and this must be taken into account in designing 'the inevitable future'<sup>2</sup>. This vulnerable 'character' should be embraced; 'the process of aging frequently lends an enduring charismatic quality to the experiential whole'<sup>3</sup>. Sustainable designed products should age gracefully according to Victor Papanek who points to the example of 'thatched roofs, wooden furniture, copper kettles, leather aprons, ceramic bowls'<sup>4</sup>. Stuart Walker notes that deterioration in what appears to be a new perfect surface, 'can cause a sense of dissatisfaction in the owner or user.'<sup>5</sup> He argues for 'aesthetic longevity'; 'Surfaces that are unfinished or created from reused parts or recovered materials.. are often able to absorb wear and tear in ways that do not detract from the overall appearance of the object.'<sup>6</sup> The cabinet in fig.10 below was built in 1839, 171 years old and still standing and working well in the student accommodation at Steneby. It has been repaired more than once, and its surface is a good example of the storytelling ability of an object.



fig.s 10 a,b,c Spruce cabinet from 1839

- Design into the object care demands, need for repair, and refinishing. Could a furniture workshop work in the same way as a car mechanic, providing a service for maintenance and upgrade? Author Ed Van Hinte in his book *Eternally Yours, Time in Design*, argues for 'serviceability, modification of appearance, and repair', as a way to avoid product dissatisfaction and disposal.<sup>7</sup>

1 Visionaries and Other Stories: A Collection of Sustainable Design Essays, 2007, p.143§

2 Emotionally Durable Design, p.136

3 Emotionally Durable Design, p.133

4 Design for the Real World, p.237

5 Walker, S., Sustainable by Design, Explorations in Theory and Practice, 2006, p. 87

6 ibid

7 Van Hinte, E., Eternally Yours, Time in Design, Product Value Sustenance, 010 Publishers, Rotterdam, 2004, p. 205

## **Planning and Realization**

My plan was broken up into;

- Weeks 7, 8, 9 - reading and researching, internet, literature, sourcing material.
- Weeks 10,11,12,13 – first ideas, design development, sketch, model, experiment, mock-ups, tests and computer renderings/drawings. Rapport.
- Weeks 14,15,16,17 - Making furniture prototype, resolving design issues/details. Rapport. Presentation.

### **Material sourcing**

Sourcing waste material locally proved to be an unexpected problem. I learnt that taking waste from soptips is illegal in Sweden. Åmål Kommun's soptip didn't allow the taking of material. However the Ed Kommun soptip were kind enough to cooperate and allow me to take whatever I needed. I had also toured the returens in Bengtsfors, Ed and Åmål, but I didn't want to take any second-hand furniture that could be sold as it was then still useable.



fig. 11 Ed Kommun soptip

## One day intuition workshop

A one day 'intuition' workshop was a great way to get started hands on sketching in the material. I made three different objects;

- One hour coatstand. A combination of 3 elements, aluminum swivel base from office chair, branch from a cut down tree, and tapered spindles from the backrest of a broken chair. I looked for the most efficient use of material, ex. structure - I identified the vertical structure of the branch as its best strength. The tapered chair spindles could easily work as coat hooks. The swivel base also allowed the coat stand to be turned. The result was a functional object with a bizarre, accidental but playful aesthetic. Here I didn't attempt to alter the existing finishes.



*fig.s 12 and 13 coatstand*



- Two hour childrens stool/table. Initially it was a combination of 2 random objects, the broken chair and a bright red oak candlestick that became the missing leg (fig.s 14,15) Here I thought the colours were the strongest elements to work with, and I thought of something that would be playful and appealing to young children. They could sit on it, use it as a low table to play on, a step to jump off, or maybe just an object to inspire their imagination (fig. 16). I added completely new elements (fig. 15) to see if it would make any difference in how we perceive it. The four 'new' pieces in birch, alder and oak are designed to appeal to childrens hands and eyes. In the re-used pieces I have worked with the existing finishes.



fig. 14 broken pinstolar



fig. 15 candlestick



fig. 16 first idea



fig. 17 addition of new elements



• Five to six hour table. I spent longer on this object to see if the time factor would make any difference, and tried to bring the design together as a whole, more unified design. Once again 3 random elements; a stained birch veneered pine blockboard door from a cabinet, a turned pine balustrade post, and a white painted metal office chair base. The attempt to change the colour wasn't so successful - water-based white primer over pine caused the oil in the existing finish to bleed through. The attempt to re-finish the top took most hours sanding back a nitro-cellulose lacquer and then the first constructional veneer. I routed circles into the top and filled them with white spackle, to break up the surface of the top and try to connect it with the voluptuous pedestal leg that grows out of the base (fig. 22). The result here was a more unified design, but it took longer than the previous two objects. Here the original finish became a problem, and required a lot of work to change it. The end result didn't feel completed, and needed more work on the finish and also making the table more stable.



fig. 18 Metal base + turned post



fig. 19 Cabinet door



fig. 20 Assembly



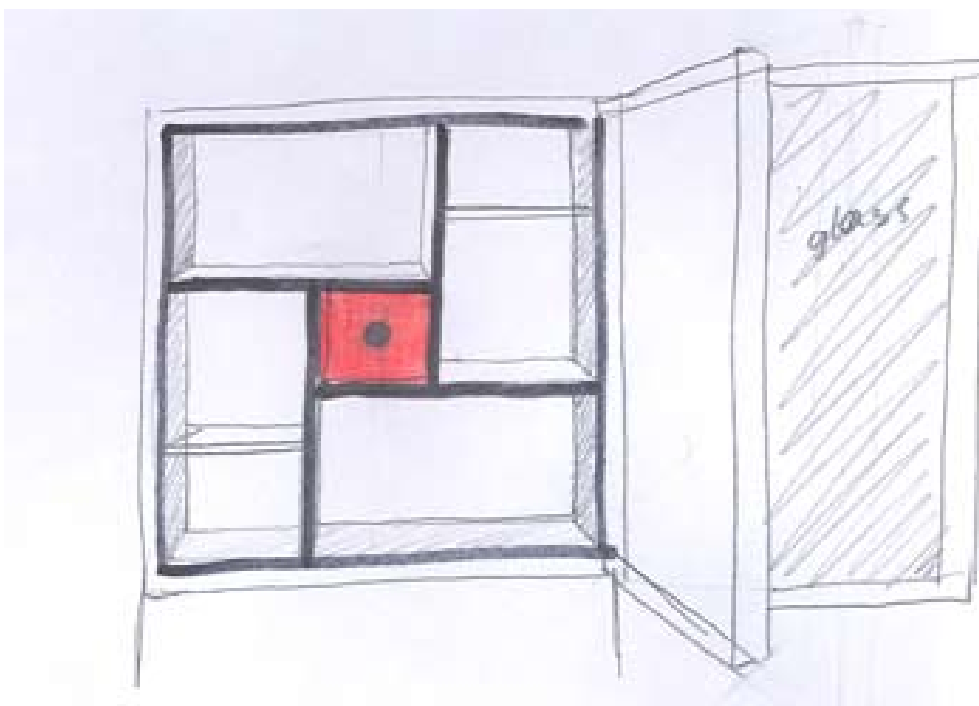
fig.s 21 and 22 Top with routed circles

## First ideas

My first ideas came from the different sustainable design strategies described in the methods section. In fig. 23 below, I had an idea for a family storage cabinet that could be personalized by using family photographs to decorate the surfaces. Photos could be printed in black and white, or perhaps sepia, to make them more timeless and also consistent, and they could be chosen to express someone's life story or a visual biography. They could work as memory cues to trigger pleasant memories of good times or special occasions. I thought that so many photographs get stored in family albums or saved on a hard drive, why not make use them to personalize a cabinet which has a lot of surface area. Another idea (fig.24) for the interior was to make a 'secrets' box, located in the center, which could never be opened or accessed. A small circular hole in the front could be used to slip in notes to loved ones, personal thoughts, and secret messages. If nobody knew what was inside the box it would be a complete mystery, and the box could become a 'living consciousness' that somehow animated the cabinet. Would this be an object you could never throw out, something to be passed on to the next generation? Having discussed this in a presentation I decided not to continue with this idea as it didn't involve the use of waste material. The photo collage would also need to be updateable and be added to, in order for the story to evolve with the user. This might involve access through a glass door. In short, I felt this idea to be going away from my brief.



*fig. 23 Idea for family photo collage cabinet*



*fig.24 Idea for storage cabinet with secrets box*

While collecting waste and scrap wood, it became obvious that the most readily available material was flat solid wood construction material, like tongue and groove wood paneling or wainscoting, and old floorboards in pine and spruce. I decided on this material for my next idea, which would be a batch-run idea for a small workshop. I thought there was potential in the storytelling aspect of the existing surface, random pieces which came from different houses and buildings and had been painted by different people (fig. 25). The once-popular existing colours combined with natural woods could create a playful rhythm. I decided on framing the material with a white border as a way to contrast surfaces and somehow enhance or 'raise' the waste as something important (fig. 26). White has been used traditionally in Europe as a colour to denote something sacred or religious. It is also used in art museums in plinths and bases for sculpture to separate the objects from everyday life, designating them as important items for consideration.<sup>1</sup>

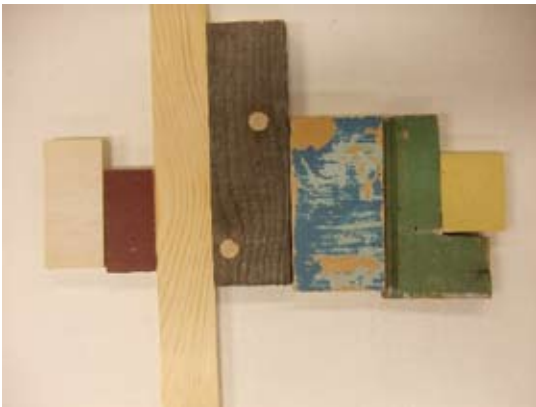


fig.25

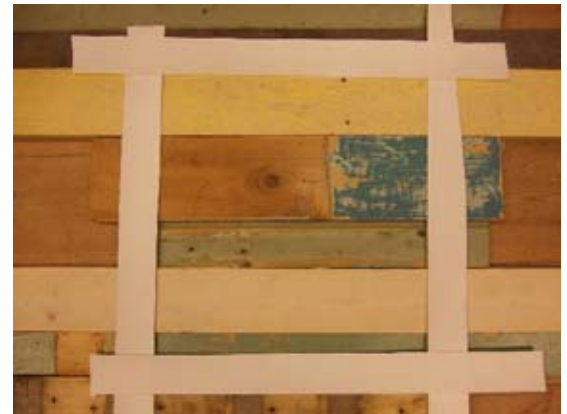


fig.26

I thought this particular waste most suitable for shelving as the components were already flat and could be thickened, keeping the original face. Having started with a box, I worked with a storage cube idea which had the waste material as a panel in a white frame (fig. 27). I thought of a 3-sided cube which could be built and stacked by the end user (fig. 28). Initially the thought was to have the waste panels fixed in the frame and by flipping the cube you could then create different spaces and views for displaying and storing personal objects. Then I realized by drawing on the computer that a bottom was always needed in every configuration, so I thought of being able to remove the panels and placing them where needed (fig.29). If every frame was the same construction, then I had the option of creating an open storage cube, or cabinet-type cube with a door. For the end user to understand this system, it had to be easy to build and reconfigure, and it would have to be easy to remove and change the panels.

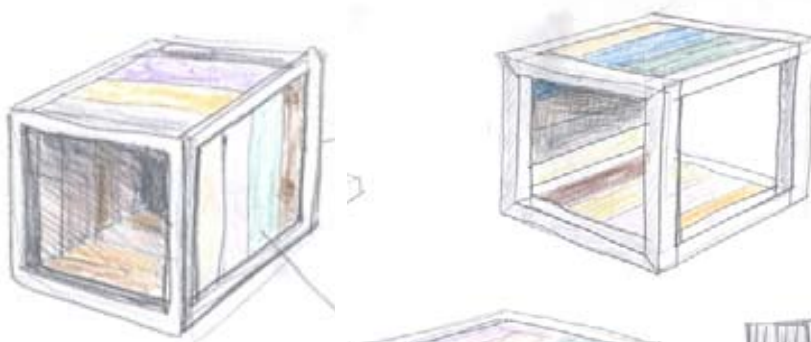


fig. 27

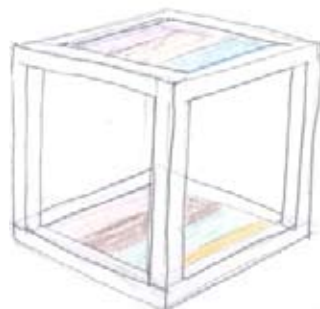


fig. 28

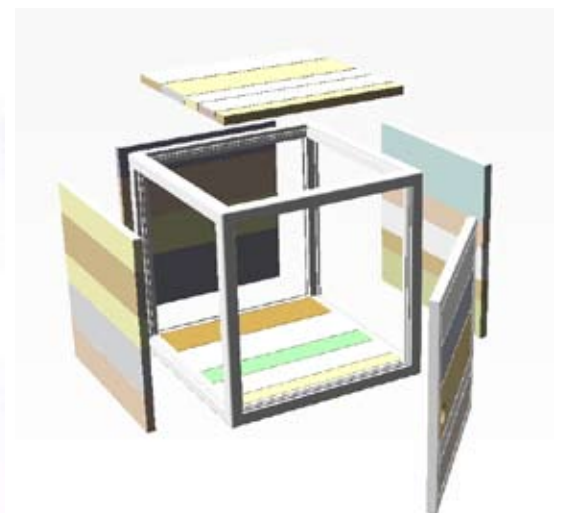


fig. 29

Other first ideas around this material were for a wardrobe (fig.30 and 31), using the original surface on the inside or the outside. I wasn't sure how this idea would work for storing clothes in the bedroom. I started to see how the rhythm of random colours and surfaces could get quite busy. I had an idea for a shoe bench in the hall (fig.32), as the material had already got associations of 'outside' and the hallway is that transitional zone between the exterior and the interior. I tried sketching up how it might work in a table top or desk (fig.33), but I didn't think these ideas suitable as the surfaces wouldn't be even, and it certainly wouldn't work in a kitchen table top that you have to eat off and be easy to wash and clean. One other idea was to link the storytelling aspect of the material that has lived, shows signs of wear and tear and age to the feeling or memory of a 'grandfather'. Could it be an armchair or easy chair that would have associations of an experienced old wise gentle giant, giving the user the comforting feeling of sitting in the protective lap of a 'granddad'? (fig. 34)

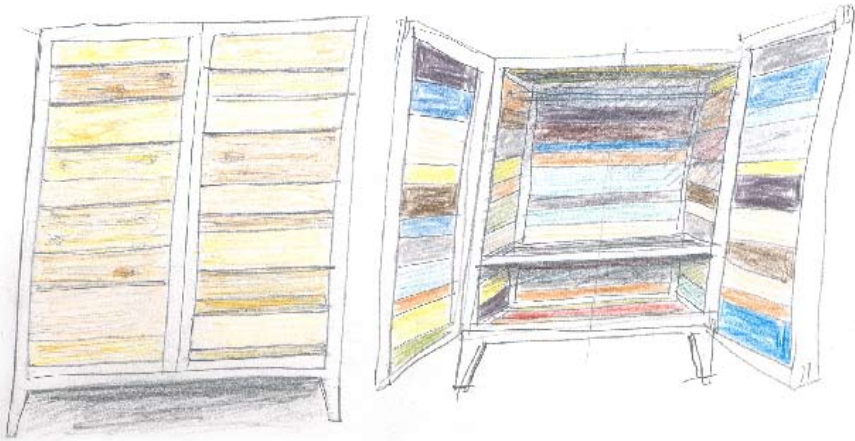


fig.30

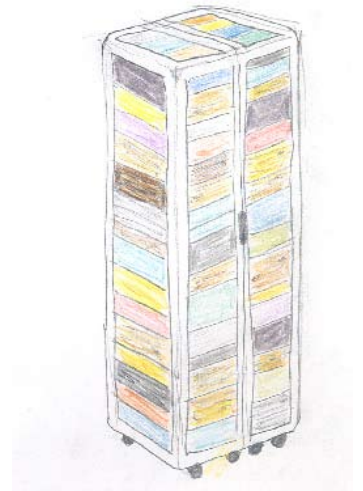


fig.31



fig.32



fig.33

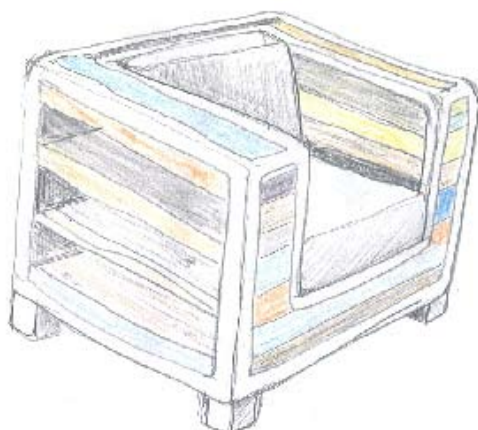
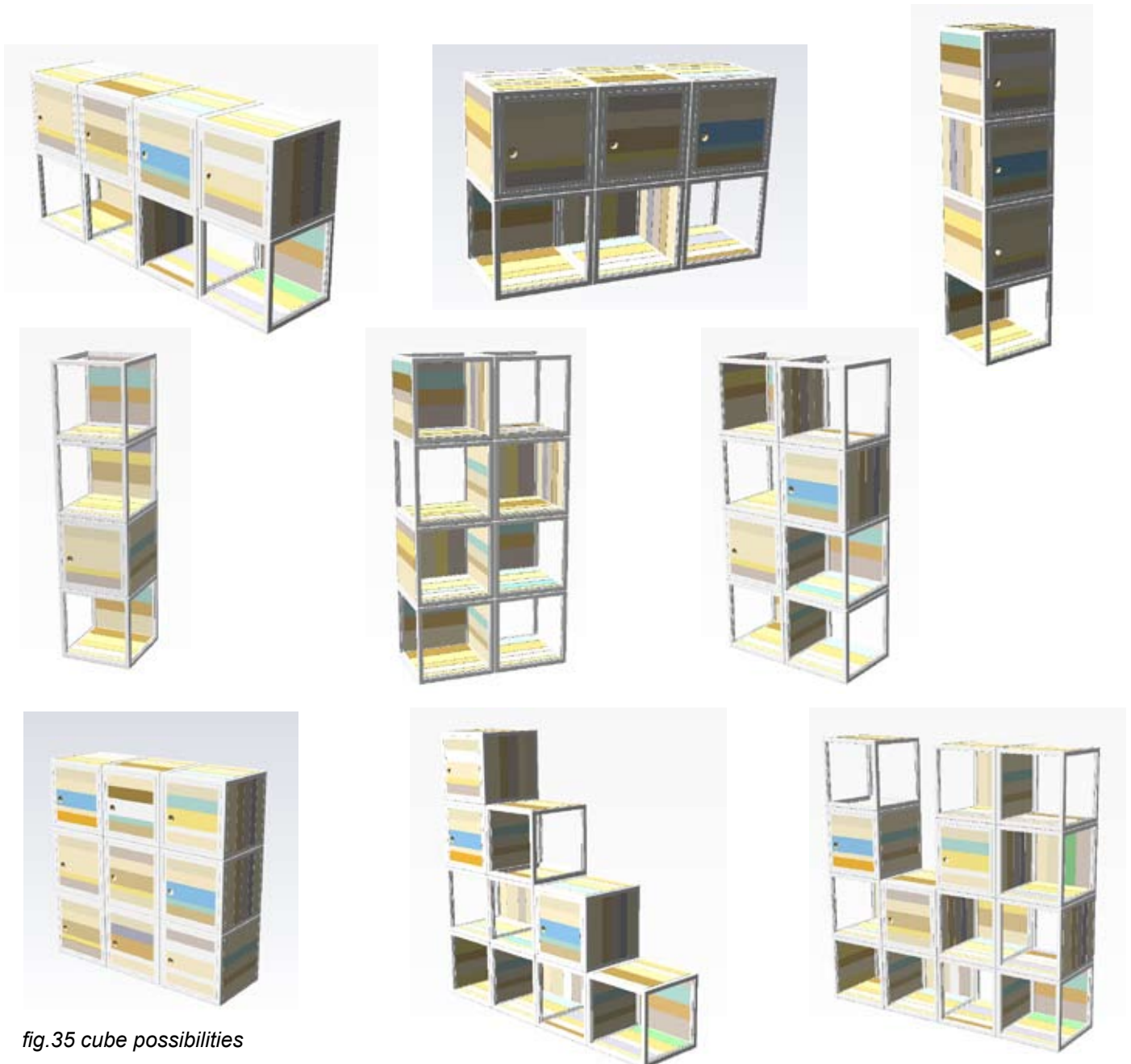


fig.34

## Development of Main Idea

I decided to develop the modular cube storage system idea, as I felt this idea best suited a batch-run production in a small workshop, and was the idea that connected with my PM the most.

The central idea here is to involve the end user in the design and creation of their own furniture. The cubes are modular and sold individually, so the consumer buys as many as they need. The thought was, by giving the end user more control in the design process, they invest something of themselves in the object. It involves their creativity and imagination. By designing and building it themselves they take ownership of it, take pride and pleasure in, in deciding the number, design configuration and end use. They set them up according to their needs, it can be adapted to a particular wall or space, can be easily added to or subtracted from, and can be built vertically or horizontally (fig.35). There is the option of open or concealed storage by buying cubes with doors. I was trying to think ahead in terms of future use and a changing need. If it isn't a fixed design, it could shift and adapt to what was required of it. An individual cube could be used as a side table, or a small sofa table. If a room was redecorated the system could adapt to a new wall-space if things were re-arranged. Could it be reconfigured into a sideboard? If moved to another room could it work as a 'home office' storage solution? Could it work in the future as a storage solution for toys and games in a playroom? If the owner moved house could it easily adapt to a new space?



*fig.35 cube possibilities*

The main function is to store and display important personal objects and valuables. It should create important spaces and a sense of order and protection. I thought of the living room as a reflective or contemplative space, and an open storage display unit can give back feelings of pride of ownership in admiring all the important things we own and collect. The square has no movement, so I felt the space created by a square form would be calm and still. The cube is a rational logical form and is easy to understand for the stacking self-build function. I found an inspiring quote in a book on architecture; 'Order without diversity can result in monotony or boredom, diversity without order can produce chaos. A sense of unity with variety is the ideal'<sup>1</sup>. Here I thought the diversity and rhythms of the panels could be contained by the boring white square frames - they could work well in contrast with each other. The system can store and display books, magazines, ornaments, sculpture, expensive glassware and crafted objects, favorite potted plants, framed family photographs. I thought it should also be able to accommodate a music system, or even a shelf space for a television. The concealed storage cube with door should work for drinks, bottles and glasses, perhaps it could store family games and toys too. Though the interior space is the same in every cube, 355mm x 355mm, the view into the space can be altered by changing the location of the re-cycled wood panels. Also a feeling of protection and separation can be achieved by adding a back or side to the storage space. I also wanted the system to be flexible and work as a room divider, so be equally visible from all sides if required.

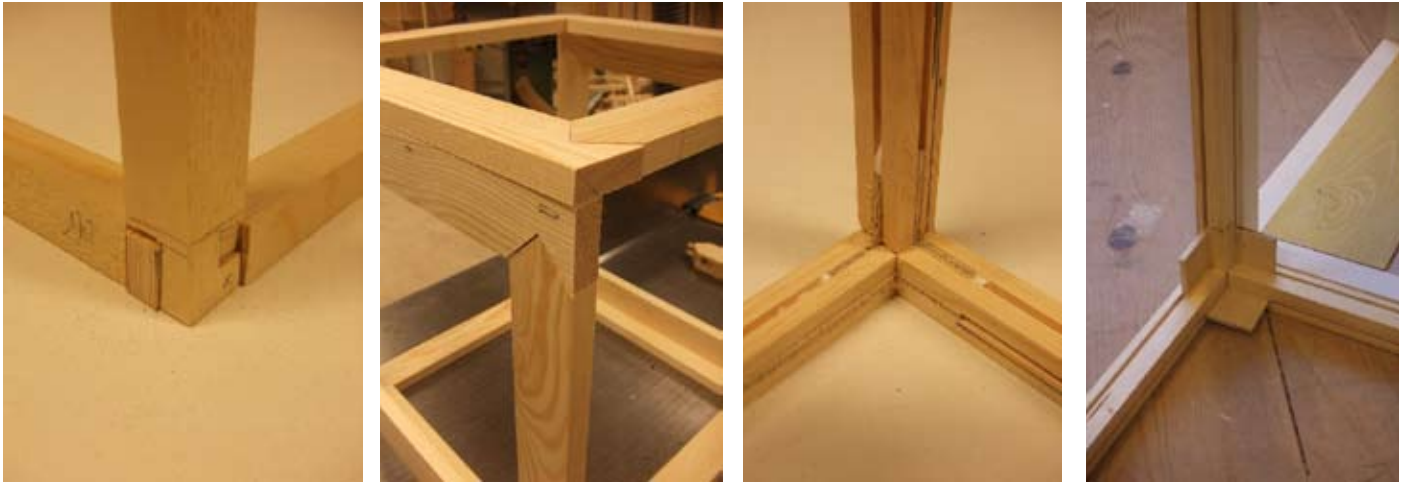


*fig. 36 Living room use*



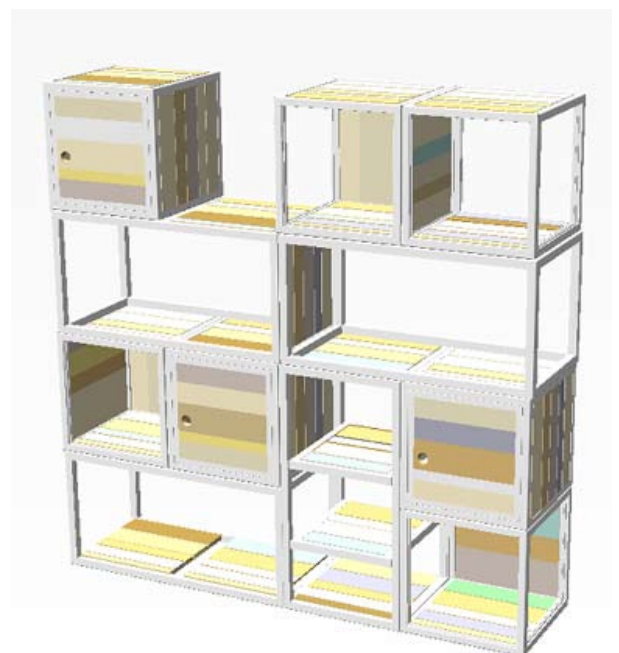
*fig. 37 photoshoped sketch*

The design developed after resolving the 3-way joint problem with a groove for a 4mm plywood loose tenon. This joint came out of a one day workshop I had in Växjö University with my handledare Kalle Nuszowski where we made several joints to resolve this problem (figs. 36). A test mock up in pine with the plywood joint worked out and was strong enough to sit on. My thought was to use the groove in the frame for both the corner joint, the panels and also to connect the cubes together and make the whole stable. I was thinking also how to machine the components with the same profile to make it more batch produceable. I was also conscious of designing around the machinery in a small workshop.



*figs. 38 Test joints*

I wanted to see if I could reduce the material by creating a rectangular double cube module, however this proved difficult as for a span of 800mm I needed even thicker stock in the frame (fig. 39). I looked at putting in a middle support but this complicated the ability to remove or add square panels. A middle support would have to run on all four sides, so I was back to having the same amount of material again. I thought about a metal frame at this point, it would be lighter and stronger, more durable, but I struggled to think of a metal profile that would allow changing the panels within the system. There was also the issue of finishing metal in white, and I found out that powder coating, though an efficient finishing system, discoloured with time in uv light, and wasn't easy to refinish. If I used wood and a low-impact water-based paint, the finish could be re-painted in the future if required. Here I chose birch, as it was a renewable locally sourced material and could take a paint finish well because of its smooth grain.



*fig.s 39 and 40 Use of a rectangular frame in system*

At the time of writing, the design is still unresolved. I'm working on a way to reduce the material, and gain a shelf or useable surface by removing a cube (fig.41). I need a simple way to connect the cubes using the groove, that makes the whole stable (fig.43). I'm working on a mechanism to secure the panels in the frame. Also the door design and handle detail have to be decided on (fig.4). I want to design a modular leg or base to raise the cubes off the ground.



*fig.s 41 and 42 Prototype in development*



*fig. 43 connecting mechanisms*



*fig. 44 door detail*



## Results

The results from the one day workshop were semi-complete functional objects that were playful in their combination of materials. As a business venture it was feasible to make in a small workshop, but as there's no way to find a consistent source of material, every object would be uniquely different and a 'one-off'. With this workshop, the main conclusion I drew was not to alter the existing forms and finishes but work with them, and if they were to be changed or altered, careful time-efficient decisions needed to be made.

The prototype of my main idea is still in need of development. Visually I feel the use of new material in the white frame does create an effective contrast to the recycled wood, and the two combined work well together, one creating a strict sense of order with straight lines and right angles, and the other creating a playful haphazard rhythm within, which can be altered horizontally or vertically. I didn't have as many coloured boards as I initially thought, but I had lots of pine and spruce waste panels from the construction industry, and these woods provided a warmth and lightness. The panel boards are all of different widths, and their randomness and unpredictability might bring visual interest to otherwise flat shelves and planes.

From a functional point of view, there is a question as to how it looks when full, and will the colours and textures take away from or compete with its display function. I also have a question about having the same space throughout - how does that work with big and small items? The idea that it could work as a room divider works as it looks the same from the back as the front. There may be a problem with dust collecting in the groove of the frame.

From a constructional point of view, there is a real question as to the amount of material in the frame, in comparison to the achieved result. Every cube has potentially 2 useable shelves, but as soon as you stack them directly on top of each other, you neutralize the use of the top. In this way, it seems a lot of work and energy to achieve one interior space. Though every component in the frame is the exact same profile and is batch-produceable, it doesn't seem to achieve enough, or is doing 'the least with the most' in Papanek's terms. Perhaps I need to develop a way where the stackability allows the optimum use of useable surface or shelf. Likewise the work involved in recycling the waste wood needs to be measured up with the end result. Pulling the nails and metal parts wasn't a big job. Because I needed short lengths I could often cut around the nails. A strong magnet also discovered any hidden nails or staples. Most of the work in converting this waste was ripping, surfacing an edge, thickening a parallel edge and thickening every board to 14.5mm. It was then tongue and grooved on the spindle moulder. Only one original surface is untouched or unworked, so I have altered the material quite a lot. In its use as removeable panels, there is the danger of the wood moving, so perhaps there is a question here of suitability for this purpose. Is it the right choice in the solution? The corners of the cubes are also a weak point, being a mitre joint. I dropped a pine mock up and it cracked open right on the mitre, so there is a question about the durability of this joint.

## Discussion

In some way, starting a design process with the waste material first, always felt like working backwards. I can see how this could be perceived as looking for a remedy for an pre-existing problem.

The big question that came out of this project, still unanswered, is how a designer can create or influence the user/object relationship. How does my shelving system idea answer my problem formulation?;

'How can the object be playful, give delight and pleasure, celebrate human expression, thereby establishing an emotional connection with the user(s)? How can it form a meaningful relationship that will preserve the objects lifecycle?'

This is a difficult question to answer. It is playful storage somewhat, though its hard to measure the pleasure and delight it could give back to its owner. There could be an element of pride in owning a furniture with reclaimed materials. The fact that it can change and adapt to different spaces is a plus. That the user can build and reconfigure the system means that it should be easy and understandable. However removing and adding the panels to break up and organize spaces might make it too complicated - though that depends on the users 'hands on' ability. There is the question; if you set it up a certain way, and it works, why change it? If in the future there is a need to change it, at least that option is there. It isn't a fixed piece of furniture and I thought its ability to shift to a future use is an advantage. It could be argued that although I'm giving the end user options, those options are pre-designed, and there are limits to its flexibility.

In order for the system to be personalized, it also needs the room it will work in, and the personal objects to be stored in it. This is probably the ultimate way to 'personalize' furniture. My intention in involving the customer in the decision-making was to give them a sense of personal accomplishment, in making choices that help them take ownership and responsibility of the object. Will it become more self-expressive as a result? I think it would become self-expressive when they 'personalize' it with their valuables, more than by deciding on the configuration. Perhaps it needs more design possibilities for them to feel like its uniquely theirs. Stuart Walker writes that customer participation in the design process can create a far richer material culture; 'our lack of involvement in the designing and making of objects, and our consequent gap in understanding, undoubtedly affect how we value them'.<sup>1</sup>

Will the end user form an emotional bond or connection with this piece of furniture? I realise that its outside of a designers control to create an emotional connection between the user and the designed object. Consumer psychology is like a fascinating can of worms. Jonathan Chapman writes that 'the emotional instability of humans provides a wild card element to the development of attachments with objects'.<sup>2</sup> No two people will respond the same way to any object. Emotional Design author Donald Norman notes 'our attachment is really not to the thing, it is to the relationship, to the meanings and feelings the thing represents'.<sup>3</sup> In Ruth Mugges doctorate research, it was found that people only form product attachment after they've had the object for a number of years, or long enough to build memories around it. This doesn't happen with new products which can only please their owner in their appearance and use.<sup>4</sup> She proposes that new products should be 'useful and enjoyable', and 'evoke sensory and aesthetic pleasure'.<sup>5</sup>

If the user decided on a change that required more doors, for example, perhaps that's a change that could be provided by the service part of the business/workshop idea. There could also be the possibility of refinishing and maintenance. One tutor suggested that a customer could also bring old passed down furniture that no longer functions and have this converted into panels in the shelving system. This would give the furniture a unique personal value and could be marketed well and honestly.

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1 Sustainable by Design, Explorations in Theory and Practice, p. 55

2 Emotionally Durable Design, p. 80

3 Norman, D., Emotional Design, Why We Love (or Hate) Everyday Things, Basic Books, New York, 2004, P. 48

4 Mugge, R., Schifferstein, H., and Hekkert, P., *Designing consumer product attachment*, essay in McDonagh, D., Design and Emotion: the experience of everyday things, p329

5 *ibid*, p.331

To answer the question 'should we recycle wood?', perhaps the question becomes: should we recycle wood in furniture? In Åmål Kommun, I found out that the wood waste is taken by a private entrepreneur and converted into pellets, which are then burned for heat. This makes some ecological sense. But there is also the issue of crafted work being disregarded and destroyed when it can be reused and reappraised. It seems that wood, maybe because it is often a renewable material isn't really valued. In a country like Sweden with so much forest cover, deforestation may not be an important issue, however it is an economic problem in Ireland where all woods in commercial use are imported. There is a value in harvested material that nature took time to grow, and then there is the value of it being converted and crafted into components for furniture or construction material. I think there is great potential to reuse and recycle wood in furniture - the question becomes how its done.

## **Conclusions**

Though I have, as yet, an unresolved design, I can take a lot from this project. Sustainability is a broad subject that engages us on many levels. In sustainable design, the goals of product longevity, continuity and endurance, have never been more valid and necessary than today. I can see this project, on the whole, as defining a direction and an area I'm only beginning to work in. The time and opportunity to get a thorough foundation in the issues at the heart of sustainable design will prove invaluable in future projects.

I feel I've gained an understanding in how design works on a deeper level, and learned a little how consumer psychology operates. Emotional responses and the consumer-object relationship are outside a designers control to influence or shape. The outcome or response will inevitably vary from person to person. Perhaps a designer can only attempt to create an object that communicates what Alvar Aalto calls a 'life enhancing charm', and hope for the best.

Perhaps I'm too close to the project at the moment to be able to ascertain if I have found a justified use for this material in its second life in the shelving/storage system. My intention was to reappraise the waste and give it a new value. The idea in its present form has some problems, but there is something there to develop and work with, and I want to continue with it.

I think there is great potential in recycling waste and salvaged wood and discarded furniture for an 'upcycling' workshop. I want to develop a business vision founded on sustainable design principles, and this project is a first step in that direction.

## **Abstract**

Mitt examensarbete kan ses som en studie i material, funktion och affektionsvärde. Jag undersöker potentiella användningsområden för skräp, överblivet trä och begagnade möbler. Jag vill göra funktionella möbler, skapa hållbara känslomässigt slitstarka band mellan användaren/ägaren och objektet som i slutändan kommer att ge produkten ett längre liv.

My exam work could be seen as an investigation into material, its use, and its emotional values. I'm exploring the potential of waste and salvaged wood, and discarded furniture. I aim to reappraise and revalue it, giving it a second life. I aim to make a functional prototype and create a sustainable, emotionally durable relationship between the user/owner and object that will ultimately help prolong the product's lifecycle.





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## **Image source**

Fig. 1 <http://www.storyofstuff.com/> (26-3-10)

Fig. 2 <http://www.ecostreet.com/blog/recycling/2009/04/09/13-distinctly-african-recycled-objects/>

Fig. 3 [http://www.britishmuseum.org/images/cc\\_briefcase\\_l.jpg](http://www.britishmuseum.org/images/cc_briefcase_l.jpg) (21-04-10)

Fig. 4 authors own

Fig. 5 image from Papanek, V., *The Green Imperative*, 1995, p.140

Fig. 6 [http://www.freitag.ch/shop/FREITAG/page/fcut\\_page/detail.jsf](http://www.freitag.ch/shop/FREITAG/page/fcut_page/detail.jsf) (10-04-10)

Fig. 7 <http://www.architonic.com/pmsht/plus-unit-magis-spa/1027953> (20-04-10)

Fig. 8 <http://www.fredrikfarg.com/> (14-04-10)

Fig. 9 image from *Svenska Möbler - Under femhundra år*, Natur och Kultur, Stockholm, 2008, p.290

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