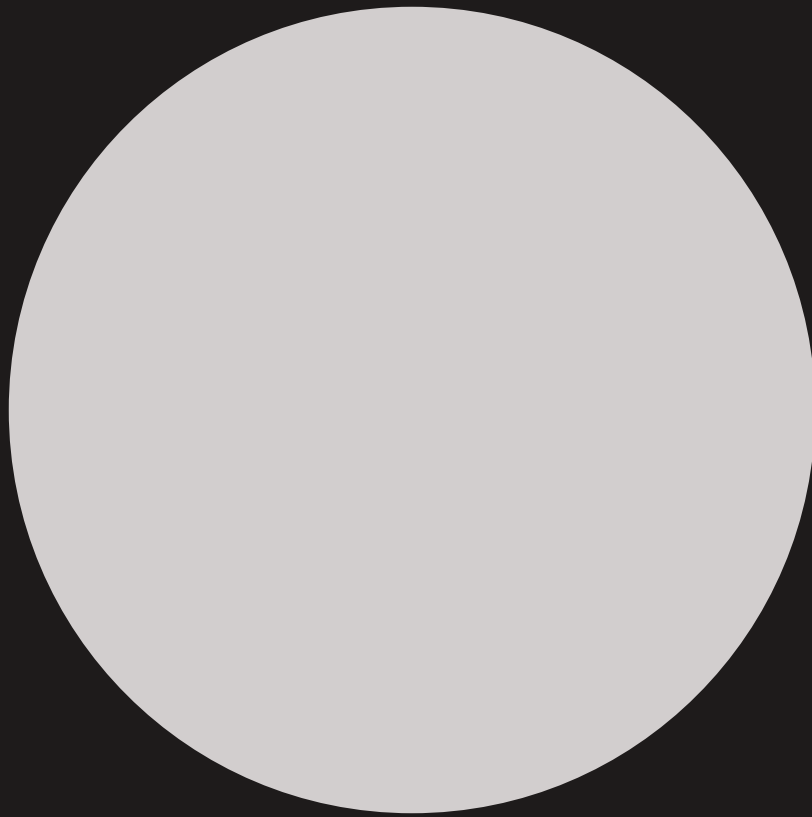
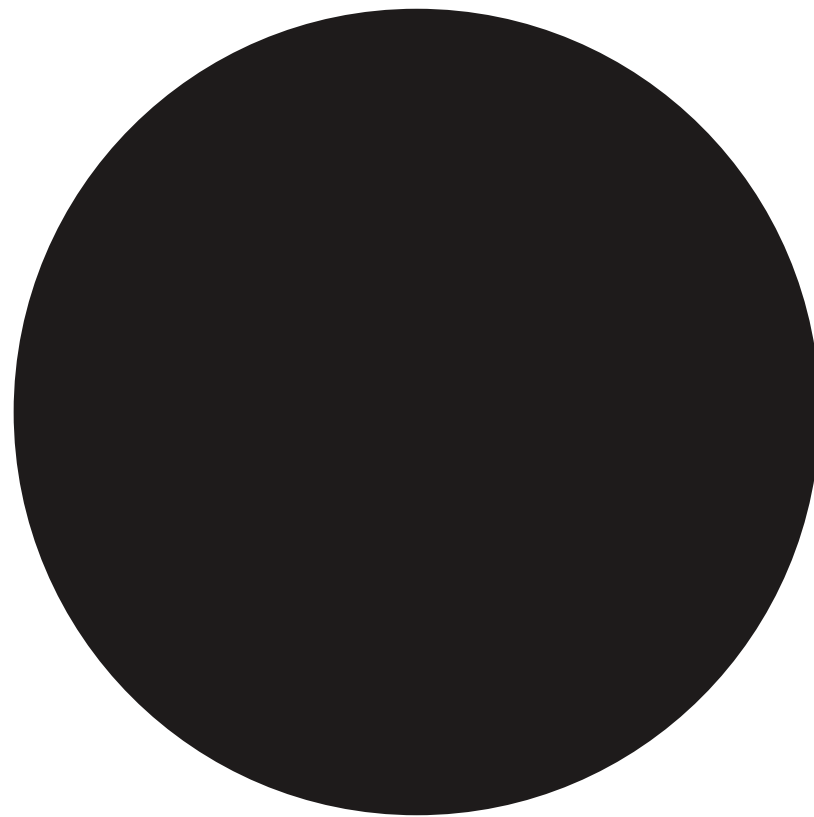


Conducting design research regarding the consumption of light.



Jop Japenga & Gordon Tiemstra

Interactive Institute Stockholm
Design Research Unit
December 2010



Foreword.

The following report contains the outcome of the design research project we have undertaken as an internship at the Design Research Unit, part of the Interactive Institute (ii) in Stockholm. It has been a collective effort in which we were inspired and supervised by Johan Redström, Design Director at ii. The start of the project took place in the beginning of September 2010 and lasted until half December 2010 while being alternated with individual work, which resulted in a seven week project.



Table of content.

A	Introduction
8	Chapter 1. Consumption of light
28	Chapter 2. Approach
34	Chapter 3. General conclusion
36	List of references

General introduction

In western society it is common to find a building still in use 300 years after it was built. Generally the only things that remind us of the original are the outer (and some of the inner) walls, the rest has changed over the years. However, its essence is still present and can therefore be considered guidance for use (e.g. in the way it influences the interior). Numerous families have been living in this house and while consuming it they all set different requirements for pleasant living: extra entrance, dormers, extensions etc. have been added. Over time as well this house as its consumer changes, in a sense the people that live in this house sort of became its architects (Rendell, 1998). It can be said that buildings offer the opportunity to be adapted instead of demolished to build a new or better one. Over the years a sense of character accumulates which mostly makes inhabiting this old house much more distinctive than living in a newly built construction.

One reason buildings in western society live such long lives is the difficulty and expenses involved in breaking them down. Although often because of their high economic value, everyday objects sometimes remain for centuries as well and with their age, their value usually increases. Whether in an emotional, historical, aesthetic or even practical way, these objects are occasionally valued higher than they originally were (e.g. old cars, leather apparel, wines, musical instruments). This can happen as a steady increase but can also in waves of appreciation as in fashion.

As the functionalities of today's technological products get more specialized they lose their flexibility. With a carefully designed way of interacting with the ever more complex objects around us, it gets harder to interpret their use in our own way (or interact with them a different way) when their intended life ends. Information gathered during the product's use is often discarded, as are its still useful components. Even though objects seem to gain certain value over time, we make them so static and specific that they simply cannot keep up with technological and societal changes. Although interactive products adapt to changes in their context on a

short term, they generally remain behaving like this on the long term regardless of the changing zeitgeist.

As explained, most of today's products don't live nearly as long, something that especially counts for interactive ones. As technology evolves quicker and quicker, its materials are consumed at an ever-growing pace. At the same time it is becoming clear that the earth's resources are actually finite and it is impossible to keep digging them to feed our material hunger. All this makes the question rise or product designers could learn something from e.g. architects in terms of ways to consume and how to design for consumption? Not with the intention to copy architects, as it is a whole different area to design for, but to be mirrored to and inspired by. In order to develop some groundwork for answering this enquiry we tried to explore a design space related to this subject to provide insight in the fundamentals and the way they relate to each other.

Designers can use the information that originated from this project as inspiration, information to build guidelines upon or any other way considered valuable. Our objective is to make designers aware of how to design for several types of consumption, and its consequences, as we do not say what is good or wrong we leave it up to them how to interpret this. All in all, we designed for discussion that had to lead to new, refreshing, insights concerning the topic discussed.



Approach

A traditional approach, that is frequently used to generate knowledge, focuses at solving a certain design problem based on a well-defined research question. Several design ideas can be tested by the parameters or requirements defined in the design brief and through iterations these concepts close in on the best 'solution'. Having the opportunity of an internship at the Interactive institute, one main interest is this specific approach of design research, which resembles the method of 'research through design'. Instead of starting with a clearly defined research question or design objective, we decided to explore a new and specific design space by using exemplary design research.

As starting point of this project we took a series of interrelated topics surrounding consumption, lifespan and transformation. Although it was clear from the start that these topics have quite some overlap, their exact interrelations were still vague. As it has been our goal to define a design space surrounding these fields of interest, while preventing existing notions of products to narrow down its potential, the several dimensions have been explored using exemplary design proposals. The relations between these design proposals, of which some worked out more into depth than others, defined the design space that is presented in this report.

Next to what has come out of the design process, the second section of this report contains information about the design process itself since it has been our main goal to become acquainted with the approach of the interactive institute

Focus on light

In order to become meaningful, being able to communicate the outcome of this project and to let the corresponding designs speak, a context was required. Since 'light' will always be around, and because light is usually quick to work with if several prototypes are needed, we decided to focus on light consumption.

Introduction.

Chapter 1.

Consumption of light.

1. Introduction

In this first chapter two extreme concepts are described that both approach the consumption of light from a different angle. Next to this, several explorations, in terms of exemplary designs, that relate to light consumption are explained. By combining these explorations, and reading through them, a story will slowly emerge that will have a refreshing influence on contemporary conception of light (design).

1.1.1. Light soul

Some materials are being perceived more appealing after they have been consumed intensively. These materials contain a sort of soul or character that makes them more valuable, which is generally called graceful aging. As the title reveals, the following concept revolves around the soul of light. More specifically, the way light can have a soul and how this soul ages (gracefully).

Within the concept Light soul lamps will only be functional after being provided with a ring that has to be placed between the bulb and the socket of the luminaire (image 1). This ring embodies the soul of the lamp and can be considered as the connection between the energy that comes out of the socket and the bulb that generates the light. The state of the light's soul is reflected by the rhythm of the light's brightness. This rhythm evolves over time as it is influenced by the way light is being consumed (image 2) according the amount and type of use. From the rhythm of the light it can be derived whether it has a younger or older soul to which people can attach values (image 3). The ring that represents the soul is modular and not bound to a certain type of luminaire or bulb.

In this concept light is being presented as something that is similar to the essence of life; immaterial and untouchable but essential elements. The luminaire and bulb are merely considered as communicators and embodiments of light, since the soul is considered as the fundamental key to translate energy into light via a bulb; comparable to the eating and behaving of the human being.

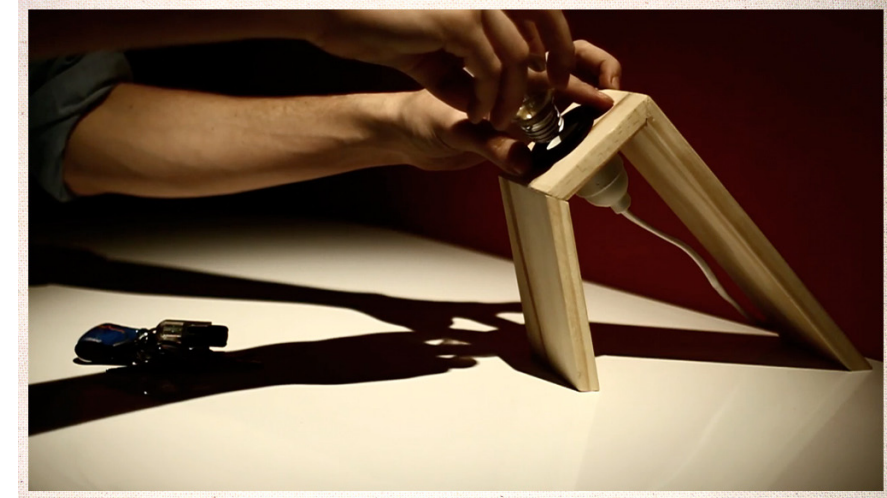


Image 1: placing the ring



Image 2: everyday use



Image 3: light with value

1.1.2. Light bomb

Numerous street lanterns illuminate contemporary streetscapes once the sun goes down. Even if the streets are empty of people the lanterns continue illuminating light and therefore a lot of energy is wasted (if approaching light from a functional perspective). The concept of Light bomb is about a more dynamic and temporary system of illuminated streetscapes, which instead of using a set network of street lanterns makes use of the location of people and their desire of light.

The Light bomb consists of a sort of balloon people take with them to places with low light conditions (e.g. on the street during the nights, image 4). Once a person ends up at a spot where a high amount of light is wanted, to get a clear overview about where they are and have to go to, the person will activate a Light bomb.

Stretching the Light bomb (image 5) takes care for this activation followed up by firing it towards the spot the person wants to light up. Once the Light bomb hits the ground it will immediately start growing in size and simultaneously emit a gradually increasing amount of light (image 6). After a few seconds, during which a big part of the surrounding has been illuminated, the Light bomb has reached its equilibrium and will explode. In a split second the surrounding transfers to its old low light condition like nothing happened.

As its functionality already explains a bit, the Light bombs can be used anywhere a person wants it to and are therefore very flexible and dynamic in use. With the Light bombs the presence of light is valued different than with street lanterns since it is only used during moments a person really needs it; appreciate light as it becomes more unique/not taking it for granted.



Image 4: dark night outside



Image 5: activating the light bomb



Image 6: growing in size and light intensity

1.2. Dimensions

The relations between the two concepts, that what makes them opposites, is what is considered as the dimensions of the design space these concepts are part of. The dimensions the concepts originated from are Consumption, Lifespan and Transformation, which will be illustrated by elaborating on the two extreme concepts that were explained in previous paragraph.

1.2.1. Consumption

The dimension consumption is based upon the amount of energy and material that is being consumed within a concept, which can either be very low or very high. Each of the concepts has to do with the consumption of as well energy as material which together is considered as the consumption of light.

Light bomb illustrates how a large amount of light can be consumed in relatively little time: within a few seconds the balloon increases in size along the increment of light. This exorbitant way of consuming energy results in a relatively high amount of waste that consists of exploded Light bombs and light that is gone after just a few seconds of use (image 7). In order to become really functional the Light bombs require to be used frequently during low light conditions, which results in an increasing and repetitive amount of consumption and waste.

The complete opposite way of consuming energy is being represented by the Light soul, which is built upon immaterial and intangible conceptions. Within this concept the energy and the material of light are considered as mere communicators of the Light soul. The material and energetic needs of light are taken apart to their very fundamentals. As separate parts they have nothing to do with light. Only when joined by the Light soul, material and energy do combine into light. The concept can be seen as a platform that allows for material and energy to join forces and illuminate. Since the soul is at the core of what it means to be light here, the material manifestations of the light (lamps) as well as its energy component (electricity) are interchangeable (see image 8). Although illumination still requires energy and material to be consumed, light itself has become the connection between the two, a separate and intangible entity, which does not consume these itself; an activator but allows for their consumption to become light.



Image 7: extensive consumption for short amounts of time



Image 8: interchangeable bodies

1.2.2. Lifespan

The lifespan of light is strongly related to the duration of its consumption, which can last very long or very short.

As explained in the concept description the Light bomb consist of an explosion of light, which only takes a few seconds before the light will disappear again. Because of this short life span the Light bomb is considered as a temporary tool to illuminate an environment, which makes it impossible to establish a 'relationship' between the Light bomb and its user. This is illustrated in image 9 where it is shown that numerous Light bombs are used in a high tempo as they are disposable. The duration of consumption is low while the amount of consumption is very high. Furthermore, the short lifespan results in a highly changing and dynamic environment.

The most important aspect for a soul to evolve is time. The more time the more things happening, the more things happening the more characterized the soul will become. The same counts for the Light soul, which has to be consumed frequently in order to develop. Along with an increased amount of consumption it is perceived higher as it ages gracefully. A soul is also influenced by the guises adopted and people (users) been in touch with, whereby it will go through several phases during its life and, so to speak, reincarnates (image 10). The values people relate to light in this concept goes beyond the primarily functionality of illumination thanks to its long lifespan, which offers the opportunity to be consumed in an opposite intensive way as the Light bomb.

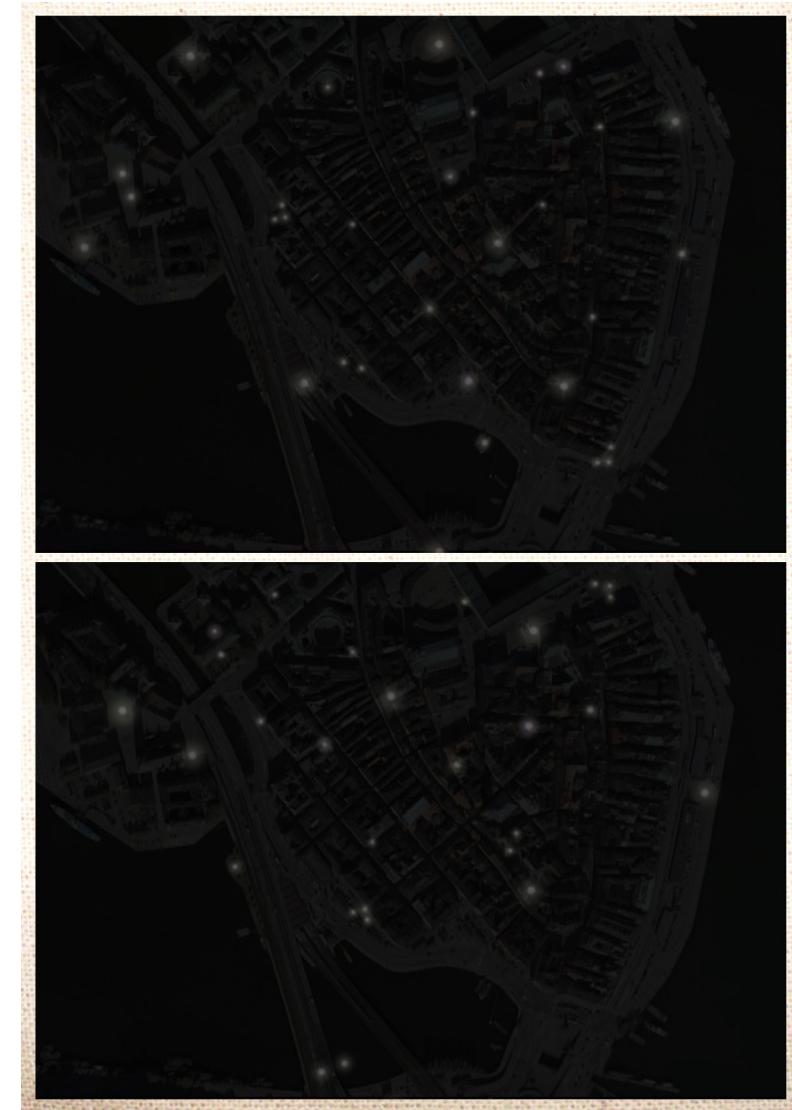


Image 9: dynamic street lighting



Image 10: a light with a past

1.2.3. Transformation

Frequently consuming light according the two concepts will result in transformation, which either emerges in a product (the light) that transforms or the perception of the user, how to use the light, transforms.

Since the functioning of the Light bomb is open for interpretation users might as well explore situations it can also be used in as their motivation to use it. Through such explorations new opportunities open up, which is simplified to execute repetitively due to its short lifespan. Consuming light combined with a short lifespan makes it that the user is free in reinterpreting a concept like Light bomb in a different way than intended. As shown in image 11 the explosion of light is used as alarm to wake up; although the functionality of the Light bomb stays the same its practice has been reconsidered.

A variant way of transformation that appears after consuming an amount of light comes forth in the Light soul concept. As explained, the soul needs a relatively large amount of time to evolve and gain more value. The changing of the soul can be considered as a transformation of the object; graceful aging. Graceful aging normally appears on tangibles that consist of specific materials, the Light soul however is an immaterial conception that makes it that graceful aging shows up in a different way. In this concept the Light soul ages in an intangible way but is perceivable since it is communicated through light. As people value a Light soul on its age it might be that they will first mature a few years before being sold, comparable to wine cellars (image 12).



Image 11: light bomb used as a timer



Image 12: aging lights in the cellar

1.3. Design Space

In the previous chapter we have seen the relations between the two concepts and we now know the dimensions in which it is relevant to compare them. We now define a certain design space based on these dimensions. Within the design space several concepts make the dimensions 'cross' at different positions. Each design proposal shows another way in which these central themes might be connected in the design of light. These proposals combined form a new design space, a field of opportunity for new concepts of light.

1.3.1. Consumption

Regarding light there seems to be consumption on two important levels: consumption of energy, and the consumption of material that allows for this energy to become light. Both are needed for light to be used, or consumed. These different types of consumption can interrelate in different ways.

In the Bubble concept (proposal 1) the material transforms over time with the consumption of energy. As the material transforms it remains useful, although in another way perhaps and only until a certain point in time when it simply wears off. Material and energy consumption are joined into one here.

The Guerilla (proposal 2) nodes might actually accomplish the opposite as they separate the energy and material from existing light sources. The concept allows for the consumption of light through its own materiality. It makes us re-interpret the world around us in search of light when we need it.

Screen shade (proposal 3) combines an existing material and an existing energy source and turns them into light. In separating the two we become aware of the consumption of light all around us, currently not being appreciated as such.

1.3.2. Lifespan

Traditionally, most short life products are expected to have small material consumption. It is evident however that in many cases material life spans do not coincide with the time they will actually be used. Take any of the iconic disposable plastic products, like a plastic cup. Used as a cup for only one coffee, the plastic material will not break down for another 500 years at least. How can the relation between consumption and lifespan be redefined if we take a look at light?

The Bubble (proposal 1) light communicates its stage in life through its material; one can read its 'age', even when it's turned off. The consumption of light will be actually limited by the extent to which the material allows for deformation. Current light bulbs are also useless when their wolfram snaps, but to the eye the glass material is still intact.

Lifespan in the Living light (proposal 4) concept is considered from the perspective of a human life. The material that makes this lamp, as well as the character that it embodies, will age just like a human being. Having similar phases throughout its life, it will also become an independent, autonomous creature.

The Guerilla (proposal 2) concept considers multiple short lifespans within the materialization of one node. The material only allows for a single, temporal consumption of light.

1.3.3. Transformation

Two different transformations can happen in the consumption of light: transformation of the light itself and transformation of the way humans use it. In the design of interactive light appliances these two often seem to intertwine.

In Play the Light (proposal 5) the actual response of the instruments will stay the same but because the user learns how to play the instrument, she will change her behavior over time. It is important to note that the lifespan of this light is relatively long, therefore allowing the user to experiment and learn how to use it in other ways.

Apartment Astrology (proposal 6) provides a new perspective on your interior and changes the motivations behind the way you place your appliances. It places light in the realm of the magical, nearly religious. Our humble role as mere humans is not to change these lights, but to accept them as they are: untouchable. It is only in our re-interpretation that we may act.

The Bubble (proposal 1) clearly ages physically as its material changes with use, over time. Its material transformation 'displays' the way it's used. The somewhat predictable transformation might involve people to engage in its transformation, therefore making them engaged with the light and its consumption.

Although the Living light (proposal 4) doesn't necessarily age in a physical and material way, its functionality and interaction do age gracefully. The essence of this light is its character. Because of the importance of the interaction between light and its user, the transformations in this concept interestingly happen in both the object itself and the way it is used. The interaction results in a transformation that happens while the iterative interactions take place back and forth.



Proposal 1: Bubble

The light bulb that is shown in the example seems to be an everyday bulb during the first phase of use. However, just like a lot of products (materials) the bulb starts to show aspects of use over a certain period of time.

The transformation of the bulb's shape can be related to the amount of use in terms of lighting hours and to the user who may try to inter-

fer with the transformation process by trying to steer the melting in certain directions (that meets personal taste of what is considered a beautiful shape according the bulb's age). Gradually the bulb will develop a sort of character and personality resulting in increased value.

Keywords: graceful aging, lifespan, becoming materials, consumption



Proposal 2: Guerilla

Out in the city at night, countless light sources shout for our attention. Large amounts of light are thrown at us, not with the functional objective to enlighten the streets but merely to attract attention for the promotion of advertisements.

With help of a set of artifacts it becomes possible to harvest (unused) light sources and use it for personal, more functional, purposes. This

becomes possible since the artifacts are made of becoming/intelligent materials that are able to suck light out of existing sources resulting in self-supply (just like leeches do with their host). With help of these artifacts it now becomes possible to truly make use of light that is actually 'thrown away'.

Keywords: sustainable, re-use, symbiots, becoming materials, consumption



Proposal 3: Screen-shade

Many screens surround us; we even carry some of them around. Although we usually do not appreciate them as such most of these screens can actually be considered potential light sources instead of merely displays of information.

Screen-shade is a kind of lampshade that you can use to turn your

displays into lights after their usual use is over. Turn your mobile phone into a bedside light or use your laptop to light up a romantic dinner. As well non-dynamic light can be exposed with pictures as dynamic light by beaming videos/animations.

Keywords: re-interpretation, transformation, re-use, displays



Proposal 4: Living Light

The concept of 'living light' illustrates how an emotional bond between the user and its lamp can be established by implementing anthropomorphic values in the lamp's functionality and behavior.

After acquisition the lamp will learn increasingly, similar to a young child growing up. Resulting in more diverse functionalities and the ability to understand the behavioral preferences of its

user. Simultaneously it starts testing the boundaries of what you, as its owner, allows to its behavior (puberty and so on).

Because of the human behavior implemented in the lamp you will get attached to it and start considering the lamp more as an ordinary light source.

Keywords: re-interpretation, graceful aging, human behavior, lifespan

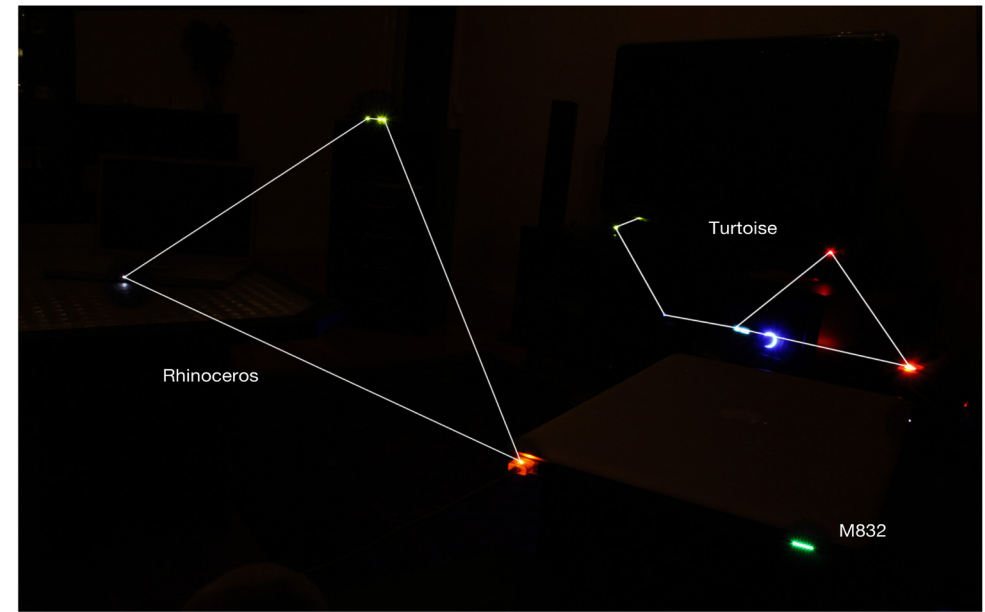


Proposal 5: Play the light

While interacting with most products you know on forehand what type of feedback the product will provide you with, which especially counts for music instruments. However, light is so dynamic and miscellaneous that it is able to simulate equal emotions and expressions that musical instruments would normally reach with sound.

This concept exemplifies how people might become able to express themselves with the medium light via an instrument that allows them to, instead of the ordinary ways to do this (dance, music, poetry, etcetera). The dynamics of light are able to express warmth, loudness, calmness, rhythms and etcetera.

Keywords: re-interpretation, interaction, consumption, behavior



**Proposal 6:
Apartment Astrology**

Coming home to a completely dark apartment we occasionally use the standby indicators of our 'sleeping' electronic appliances to guide us, much like people adrift might use the starry sky to orientate themselves.

Over time the overwhelming display of lights on the firmament has left people with wonder: Astrology. Specific stars together are considered, depending on culture, as a symbol that is often used in archi-

itecture to base the construction of buildings upon.

The 'sleeping' lights in the home environment will be used as guidance for inside architecture, as it happens in Feng Shui. The symbols that can be created by 'sleeping' lights define the rules and placement/location of several objects to create a certain experience in the environment: Apartment Astrology.

Keywords: re-interpretation, location, systems, sleeping lights

1.4 Concluding remarks

The use, or consumption of light fundamentally depends on the consumption of both material and energy (see figure 1). In order for light to exist there will always be some source of energy and some sort of material that facilitates the process of this energy to become light. In the design of light this process is the focus, unlike designing the mere material lamp for instance. Even though new (becoming) materials might illuminate as a whole, at a smaller level they still depend on both material and energy consumption.

With the design proposals developed in this project, we have looked at several ways in which transformation and lifespan can influence the consumption of light. The concepts show that these two factors are closely related and that the relation between them has an effect on the consumption of light in general.

In the design of interactive products, light is often used as a means to communicate a certain change over time. This project looked at different ways in which the use of light itself might change. This transformation in use of light can be split up in a transformation in the light, and a transformation in the use. Although light can be designed for either one of these, interactive light concepts are generally formed by alternate transformations of the two.

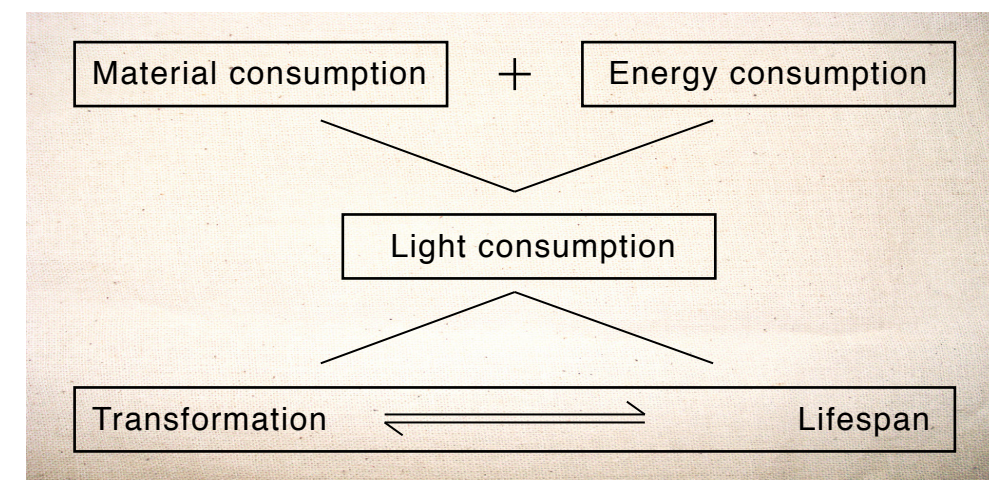


Figure 1: light consumption

Chapter 2.

Approach.

2. Introduction

In this chapter, the approaches used throughout the project will be described and reflected upon in a chronological way. Since it was an important aim of this internship to experience a new and different way of working, this part both describes and argues the steps taken in this specific design research project, and reflects upon the ways the separate methods might be used in other projects.

The project will be described in three phases.

2.1. Phase 1: Constructing a project.

At the start of our project at the interactive institute we had not yet defined a specific project to work on. It was clear we wanted to experience the different perspective on design research, but the specific context was yet to be chosen. A range of projects, articles and papers were studied as a source of inspiration for a new project.

2.1.1. Field of interest

Interesting topics were taken from the wide range of projects. Some of them had been the direct subjects of earlier projects, others related to previous work of the institute in more subtle ways. Although the source material was about many different projects, some general themes started to emerge in the discussions we had. At this stage we compiled a bald list of some of these themes that formed our field of interest (see figure 2).

Some of these themes had been combined in

earlier projects, others had not. We used some mind mapping techniques to explore the scope of these terms individually. Although we did not define their interrelations at this stage of the project, we did feel there was a general, overlapping field for us to investigate.

2.1.2. Application: light

In order to start designing with these themes a context was required. The theory we gathered and looked at from different perspectives now had to be applied to a practical case. The design of light was chosen as a central focus. Because light will always be around, but also since it exists in many different forms and our common perception of light seems to offer room for reinterpretation (e.g. what is light as opposed to a light). A third, more practical reason to opt for light was its ability to be visualized rather effectively from an aesthetic point of view.

2.1.3. Reflections

As designers of products in future contexts we feel it is relevant to be able start up projects from yet undefined themes. Whether (measurable) trends or visions based on fantasies, we believe a designers' interest, passion or gut feeling is of key importance from the very conception of a project.

Picking a theoretical context to make topics practically applicable proved to be important as well. Choosing for a single perspective to start from allows for the abstract to become concrete. Although the context might seem to limit the project scope initially, topics of interest proved to be still relevant. 2.2.

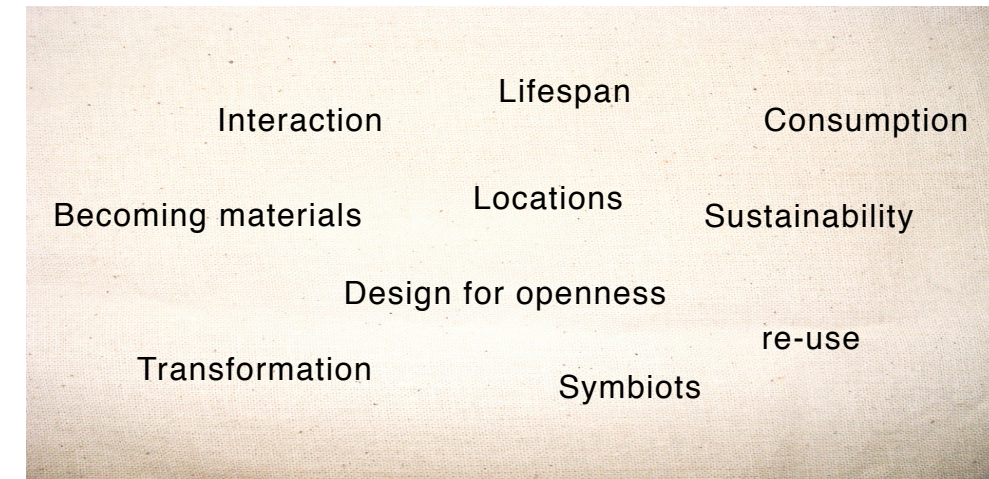


Figure 2: field of interest

2.2. Phase 2: Exploring the design space.

With some a theoretical foundation and a practical context, initial ideas explored possible concepts that would fit the topics we had been discussing. Through ideation and continuous reflection, a growing number of ideas allowed us to relate the underlying themes with ever more clarity.

2.2.1. Exemplary design research

Instead of starting with a clearly defined research question or design objective, a new design space was explored using exemplary design research. The more traditional approach usually focused at solving a certain design problem should be based on a well-defined research question. Several design ideas could be tested by the parameters or requirements defined in the design brief and through iterations these concepts close in on the best 'solution' (see figure 3).

This approach however, aims to define a new design space (see figure 4). Several concepts occupy a point in this space without necessarily being the best option for it. The individual ideas are not the main focus here since it is the relation between them that defines the design space. Some concepts might arise that are particularly suitable to communicate the dimensions that define the design space, but in essence it is the comparison with the other ideas either within or outside this space that best describes its existence.

At this stage of the project, a series of concepts based on the initial topics were visualized. The visuals and their accompanying descriptions

(proposals 1-6) should clearly indicate the potential of such an idea while still leaving topics like their aesthetics, implementation and functionality open for interpretation.

2.2.2. Dimensions

Next, it was important to reflect upon these concepts and identify the dimensions that started to define the design space. The final dimensions as described in chapter 1.3 started to surface. Although their exact definition and interrelations were not yet finalized, we had built up the vocabulary to discuss the design space as such. That is, amongst ourselves. Talking to others, it was still hard to explain what the project was really about.

2.2.3. Reflections

Starting to generate ideas on the basis of yet quite abstract notions, the exemplary design method was a fruitful approach because it took away some pressure from individual ideas. As they were mere examples to be related to each other in order to get to a better understanding, the idea of them being incomplete was actually what we were looking for: examples to get us closer to a definition.

Continuous reflection during the process of idea development proved to be of key importance. It helped identifying and filling gaps of the design space at the same time. The amount and intensity of discussion in this phase helped us understand and structure the project in new ways, through the actual development of design proposals. It shows that reflections upon design concepts can be richer while developing them. We also feel that working in a team and the amount of discussion we had was crucial to deepen the reflection.

2.3. Phase 3: designing extremes.

After a period of other work we returned to the project for the final phase. The period of leave itself allowed us to reflect on the concepts from a new, more distant perspective. The structure of the final design space had become reasonably clear to us by now, but it still required a better communication.

2.3.1. Extremes

We wanted to design two conceptual extremes within the design space as triggers to start questions and provide context as to what the boundaries of the project were. They would not be final concepts in the sense that they conclude the project as being the best proposals. They would rather function as concepts that we could use in the communication of the design space. It was however, still important to show the previous concepts for richer discussions.

A tree diagram (see figure 5) was created to systematically map the existing concepts we had and look for the extremes we were to design. Certain combinations of extremes had already been made with earlier concepts. These were helpful to relate to the aspects that we did and did not want to continue with.

2.3.2. Communication

With these concepts, the focus was on presenting them as such that they communicate the ways in which they are extreme. This was addressed in two ways, both through the content and the form of the final visuals. In terms of content we worked

out extreme situations the proposals could lead to. Extreme in their relation to the three dimensions we focused on in the design space of this project. The possible results of such situations were photographed.

We also made a short video introducing each of the two extreme design proposals. The way the videos were shot, cut and edited (in other words their form) resulted in opposing atmospheres. As 'teasers' of this project as a whole they aim to catch the interest of their viewers, indicating to some extent what the differences and similarities between them might be, yet creating enough questions and context to arouse further interest in the project.

2.3.3. Reflection

We believe that using two extremes as communicators of a field of relations is a powerful way to show this relativity. A single concept might leave the viewer with unintended conceptions of what the design space entails. Even though the two concepts do not show the entire complexity and depth of the design space either, their differences will open the mind and wonder of the viewer. In such a final phase we really wanted to focus on the outcomes of the project. In the development of the two last design proposals and their extremes, the way in which they would be visualized, through photography and film, was taken into close consideration. We believe it is very important to be aware of the effects of different media and to use them in suitable ways.

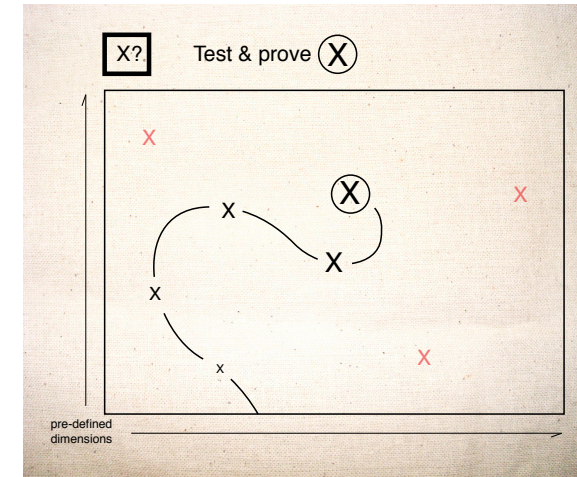


Figure 3: Traditional approach

The predefined dimensions (not necessarily two) are the requirements for the design. They form a predefined design space as typically formulated in a design brief a client might present.

Over several iterations a route is followed that leads to the eventual design solution. Analysis of the different concepts along the way might include tests which will point in the direction of the next iteration.

This approach can be described as design through research and the final design can be supported by the test results.

Although this approach works good to solve given problems in defined contexts, it will not pay attention to interesting opportunities that may come along if they do not suit the brief the best.

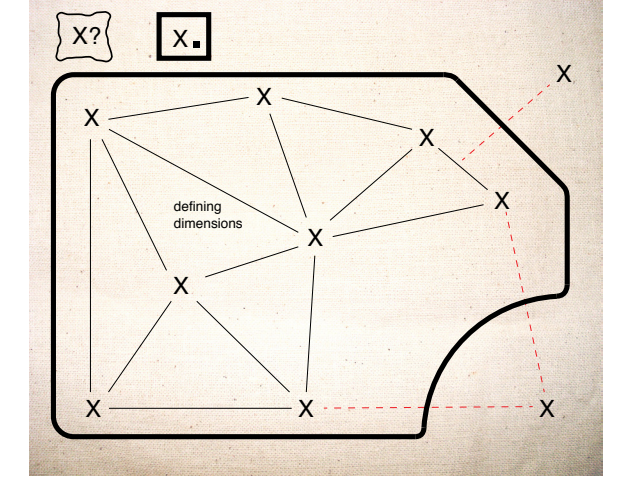


Figure 4: Design Space

This approach aims to define a new design space. The several concepts occupy a point in this space without necessarily being the best option for it.

The individual ideas are not the main focus here since it is the relation between them that defines the design space.

Some concepts might arise that are particularly suitable to communicate the dimensions that define up the design space (and it might therefore be useful to work them out to a greater degree of finishing), but in essence it is the comparison with the other ideas either within or outside this space that best describes its existence.

This type of research through design is biased by the design researchers but opens up opportunities in new areas.

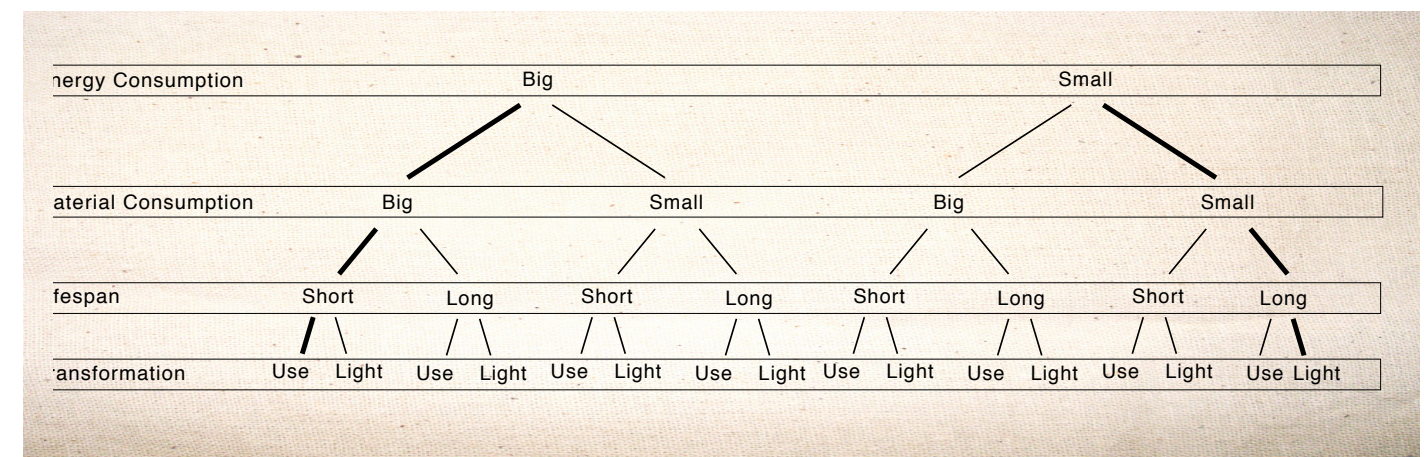


Figure 5: tree diagram



2.4 Concluding remarks

The three phases of this design research project have been defined in a chronological order, concretizing the project more with every step. The three phases are not innovative on themselves but the combination and the way of going from one phase to the other makes it quite a unique method of conducting research through design. If exploring a design space our description is possibly one of the various ways of how to do it, it is a matter of combining various procedures to investigate other manners.

After finishing this project we wonder to what extend these methods can be used in larger projects that might continue where we have stopped? The role of the project's outcome, as we have it right now, shows potential to be further explored and processed by other designers. Question is, will they merely use the outcome as inspiration, as it is based on a qualitative research, or will it be used differently? Finally, it would be interesting to see how this method can be integrated into a large design process, in which design phase will it be integrated, will the methods be split up and would it be valuable to repetitively conduct this process of exploring a design space? Food for thought.



3. General Conclusion

It has been a very interesting project from an educational point of view. Our initial aim of getting used to new ways of working have certainly been met. The direction of the project might have felt a little open and vague at times, but being two students cooperating and having an experienced coach as guide, uncertainties always lead to clarifying discussions. We believe such discussions lead to a deeper theoretical understanding of the methods we used, in addition to a practical one. It was the vagueness that made us look for underlying reasons behind all the steps we took, like one might come to a closer study of a path once the surrounding forest floor is misty.

Although we developed quite some notion of the level design researchers value this method, there is still little understanding about the way designers would appreciate and interpret such a method. Once a designer processes the outcome, it will just be a matter of time to see how this design research methodology is interpreted. This will make the methodology stronger since it will provide information about how to structure the outcome better in order to be easily integrated and used by others. What we do know is that the outcome certainly opens up new perspectives if designing with/for light and possibly also for consumers of light.