an unplugged space in an online home

i g l o o

PDMK 5900 PRODUCTDESIGN ANNE KATHRINE GAUSTAD
MASTER THEISES AKERSHUS UNIVERSISTY COLLAGE SPRING 2010

project description

"an unplugged space in an online home"

Research question

How to develop a sheltered zone that provides an opportunity to avoid distracting and stressful impulses, through exploration of user needs?

Sub questions:
- What does it include to avoid distracting and stressful impulses? In what situations does this need occur and for who?
- To many people in our culture nature holds an essential role as environment for recreational and stress redusing purposes. Which properties does natural environments hold that has this effect, and can some of these be applied in the concept?
- How, and to which extent, can one shelter the human body from exposure from radiance from telecommunication signals and other sources of electromagnetic waves in a feasible concept?

Specification of demands:

MUST:
- provide the possibility of avoiding distractions and stressful impulses
- outline a space which encourages the user to "unplug" from availability whether the need is to find concentration or recreation
- provide a shelter from radiance from electromagnetic waves (to a feasible extent)

SHOULD:
- be changeable according to the users current need
- be activating, use involvement as a way to unwind
- be available in different sizes, according to personal preferences/use

COULD:
- be modular
- be possible to use in other places where one would like to be unavailable or clear from radiance

In this project it will not be a goal to conclude on the actual risks related to radiation, but acknowledge that exits and provide a possibility of (limited) relief. Nor is at goal to claim that the progress that communication technology represents is bad in it self. However it is a goal to put a critical focus on the issue of how people are affected by such a great number of choices one are exposed to through easy access to vast sources of information, entertainment, professional work, real time communication, social medias etc., all within the walls of the home.

Method

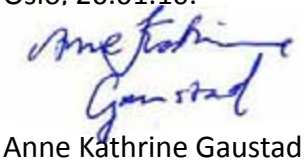
Defining of terms used to explain the task is essential and will be done in light of relevant theory. To further examine the need, it will be created fictive user profiles and worked with scenarios. The project will evaluate at which stage and how it is most useful to include potential users, for instance through focus groups, in depth interviews, participatory design workshop etc. Using observation would be difficult since it includes intruding peoples personal space. The main goal of such analysis is to bring to the surface unexpected views related to the chosen area, both the ones supporting the idea and the ones challenging it. Conducted in a successful way, such an approach should also serve as an idea generator in the concept development process. User testing will be implemented along the concept development phase as support of the argumentation of choices.

The project should be weight 50% practise and 50% theory. It will result in a three dimensional model of the concept. Evaluation of the process and the outcome will be included in the delivery.

Collaboration and marked
Since either the material nor the sales channels of this concept is given at the starting point of this project, it is not yet made contact with a producer or other possible collaborators. This will be done as soon as the process allows it. The target group basically includes everyone that experiences stress and distraction from being available, and those who would like to limit exposure to radiation from electromagnetic waves.

Supervisors
Internal supervisor Product design HIAK: Prof. Gunnar H. Gundersen (Main supervisor), Prof. Tore Gulden
External supervisor: Svein Hovde, Sociologist, Department of Sociology and Human Geography, UIO

Oslo, 26.01.10.



Anne Kathrine Gaustad

Adjustments

After discussing the research question and sub questions with external supervisor Svein Hovde during two sessions in February they have been revised to their final form:

Research question

Through analysis of distracting impulses in light of relevant theory, develop a sheltered zone that provides an opportunity to limit such impulses in the context of a home situation.

Sub questions:

- What does distracting impulses consist in and which strategies are available to limit their impact?
- How, and to which extent, can one shelter from exposure to distractions from telecommunication signals and wireless networks in a feasible concept?

The reason for the changes was to clarify the way of approaching this issues. This adjustments is to clarify the meaning of the phrase “through exploration of user needs”. It became clear along working with the project that the approach would not be direct user observation, but analysis of a phenomenon in society in light of relevant theory. The sub question “To many people in our culture nature holds an essential role as environment for recreational and stress reducing purposes. Which properties does natural environments hold that has this effect, and can some of these be applied in the concept?” was eliminated to limit extent of the project.
The method section was also revised to match the research question. The revised section reads like this:

Method

A principal overview of the problem in light of relevant theory will shape the analytical foundation for the concept development phase. To examine the need from the users perspective it will be created fictive user profiles and worked with scenarios. User testing will be implemented along the concept development phase as support of the argumentation of choices.
The project should be weight 50% practise and 50% theory. It will result in a visualization of the concept (tree dimensional model) Evaluation of the process and the outcome will be included in the delivery.

Preface

The work covered in this report is the is a master thesis in product design conducted at Akershus University Collage in 2010. The work was carried out at Akershus University Collage and in Sandefjord between January 4th. and May 16th. The work has covered the development of a sheltered zone made for limiting distracting impulses.

It is wished to express special thanks to:

Gunnar H. Gundersen, Main supervisor
Svein Hovde, External supervisor
Tore Gulden, Supervisor
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Astrid Hegdal, Anne-May Guttormsen, Bjarne Oppedal Olsen, Ida Grindertangen, Ingrid Bergseth, Ole Amund Gaustad.

Overingeniøren.

abstract

Our age in affluent society is deeply defined by access to information, communication and privileges of a great variety of choices on all levels. The information technological revolution represents an indisputable paradigmatic switch involving democratization and freedom of speech. However this development also brings challenges like information and choice overload, and constant availability changes the way we perceive the world.

In the work presented in this report it has been worked according to following research question: Through analysis of distracting impulses in light of relevant theory, develop a sheltered zone that provides an opportunity to limit such impulses in the context of a home situation.

This project consisted in building a theoretical foundation functioning as a framework product development. It concluded that the presented concept had two sides: It is a comment to a contemporary phenomenon in society. Igloo is also a product concept made for the home sphere, outlining a unplugged space intended to limit distracting impulses from availability.

index:

1. introduction

1.1. Background

Researchers both within the medical field and the social sciences are increasingly concerned with how human beings are impacted by the modern phenomenon of easy access to communication channels. Through devices like personal computers, cell phones, tv-sets etc., and radio signals or microwaves, we have 24/7 access to an immense load of information and opportunities for communication at most locations. In particular internet access represents a undisputable paradigm shift within the field of information exchange, the time span of this activity and the amount of sources. These devices play an increasingly central roll in peoples everyday life and changes how we perceive the world. However there are concerns related to how constantly being available to communication channels affects people. How does it effect the communication, ability of simultaneous capacity, concentration levels, the actual efficiency? Nicolas Carr is an american writer who addresses the question of what activity on the net does to our brain, claiming that it might have detrimental effects on cognition that diminish the capacity for concentration and contemplation. (Carr, 2008) Choice overload is also a phenomenon of affluent society. On all levels of life:
from toothpaste, to education, to facebook profile presentation, to i-pod preferences, to life companion our cultures pursue of freedom of choice provide vast variety of options. No comparison can be found in history of similar level of individual freedom. But does it make people more content? Barry Schwartz explore these questions in his book The Paradox of Choice. (Schwartz, 2004)

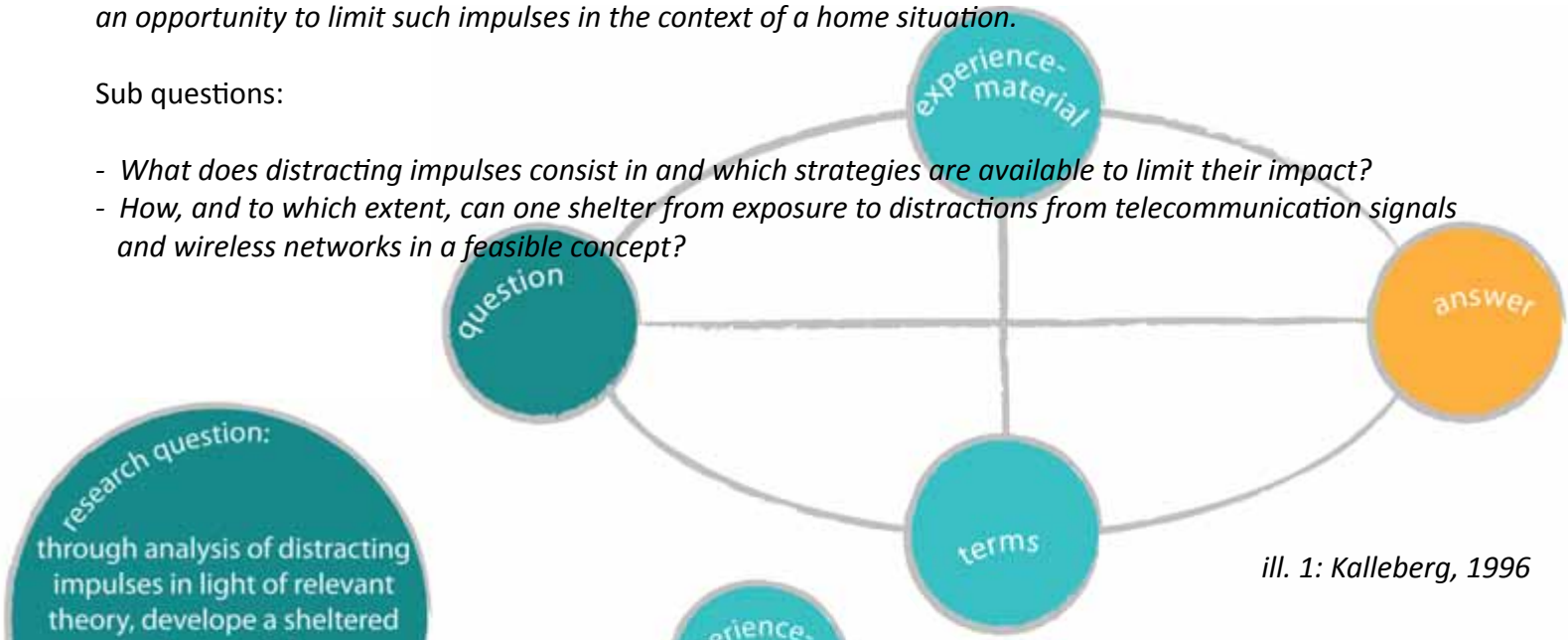
1.2. Research question

On this background it is worked from following research question:

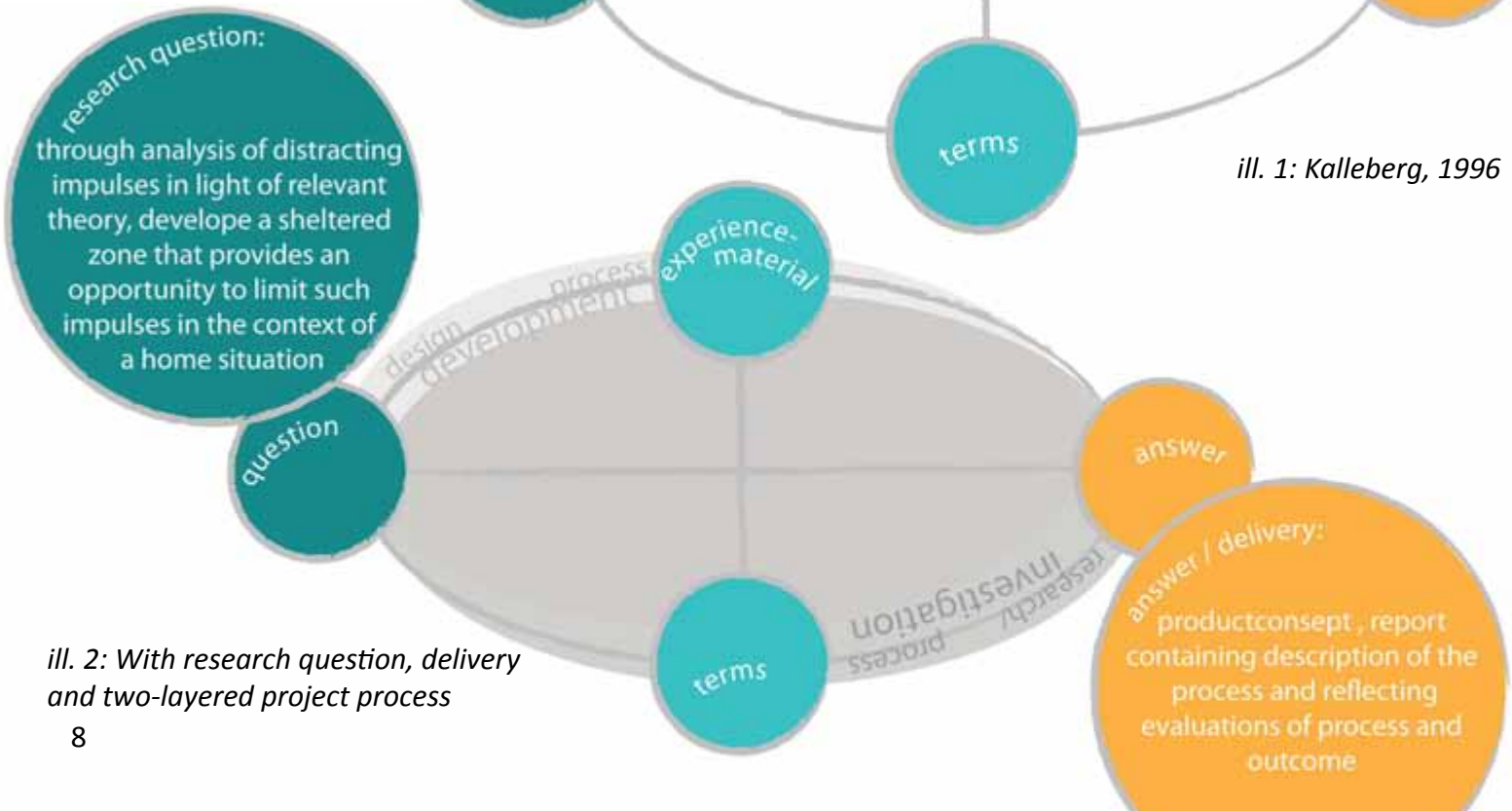
Through analysis of distracting impulses in light of relevant theory, develop a sheltered zone that provides an opportunity to limit such impulses in the context of a home situation.

Sub questions:

- *What does distracting impulses consist in and which strategies are available to limit their impact?*
- *How, and to which extent, can one shelter from exposure to distractions from telecommunication signals and wireless networks in a feasible concept?*



ill. 1: Kalleberg, 1996



ill. 2: With research question, delivery and two-layered project process

1.3. Method and data

With a starting point in R. Kallebergs model of the research process (ill.1), there was developed a research design. Illustration 2 (ill.2) shows the design process put into Kalleberg´s model, suggesting a two layered project process with research and product development. As the product development process was a dynamic process, changing according to new information that came to the surface it ws chosen a flexible design. This model has been revised during the process.

ill. 3: Research design

1.4. Disposition

This project is considered to consist in two main parts: Research on the background of the problem and the product development.

2. Distracting impulses

2.1. Distracting impulses

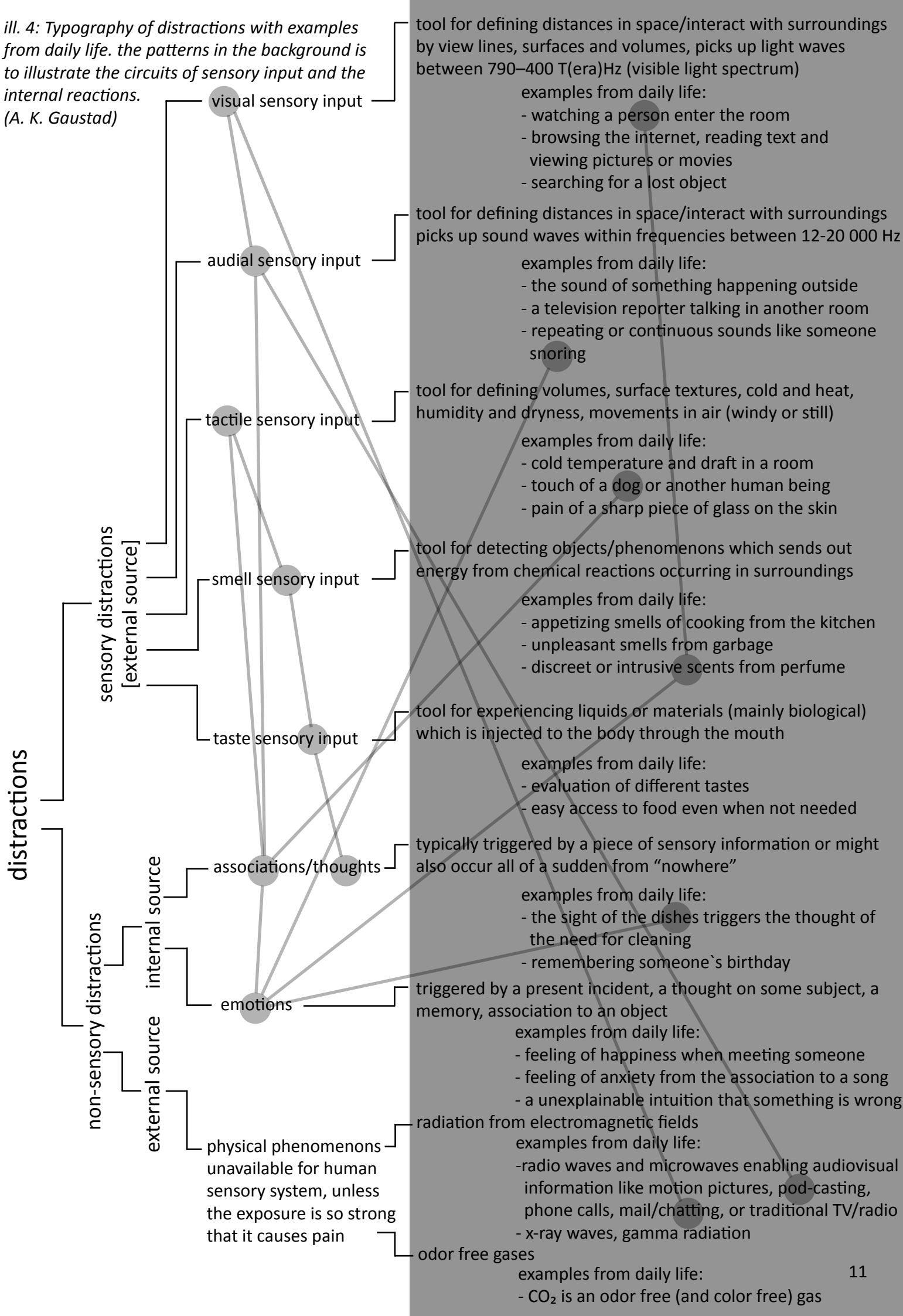
The english dictionary (New Oxford American Dictionary) defines distractions as “a thing that prevents someone from giving full attention to something else, a diversion or recreation, extreme agitation of the mind or emotions”. The duality that distraction can both be considered as a prevention from giving something full attention or as a diversion/recreation is especially interesting to this project. A distraction can be both wanted and unwanted depending on the situation.
The ability to be distracted from an occupation is of vital importance when a situation of danger occurs simultaneous. People who does not have this ability, suffer from a severe dysfunction. The mind evaluates the sensory information that flows in and makes priorities on what to pay attention to. This is an unconscious process, so self evident that most normal functioning people hardly gives it much attention. Sociologist Georg Simmel describes the intensification of this process as early as 1903: “The psychological basis of the metropolitan type of individuality consists of the intensification of nervous stimulation which results from the swift and uninterrupted change of outer and inner stimuli.” (from the article The Metropolis and Mental Life)

To clarify which kinds of distractions this project will focus on there developed a typography (ill. 4). The human brain receive and process 3000 pieces of information through the sensory system during 24 hours. It instantly interprets sounds, pictures, smells, taste and tactile experiences and links this information to earlier experiences and knowledge and associations. This is showed as a web in the illustration (ill.4) indicating the thought circuits of stored information connected together by neurons in the brain. It is not possible (or wished) to limit distractions of internal sources such as associations, emotions and thoughts. However it is possible to limit the constant flow of sensory information that triggers unwanted distractions. Among the sensory distractions it is put focus on limiting visual and audial input. Taste, smell and tactile sensory input also represent possible sources of distractions, but they are relatively constant. It is within visual and audial input that the availability of information has exploded in latter years. For this reason shielding from radio waves and micro waves is prioritized since it enables a vast variety of possible audiovisual distractions.

Distractions in the context of a home situation is relative and individual. The home is arena for many purposes; recreation, work, social gatherings and filled with individual behavior patterns and habits. Some people live alone while other share home. If the purpose is to work (or rest) possible distractions can be a phone call from work, a glance at the mess in the kitchen, a check of the inbox for new messages, the activity of a family member practicing an instrument - al these sensory input can lead to new distractions. People have different levels of tolerance towards being distracted. Some are absentminded and any little piece of information can make them follow a completely different track than intended. Others are more goal oriented and have good abilities to focus despite distractions. The actual level of distractions also vary. Still anyone that have devices like TV-sets, radio, cell phone, or devices allowing to access internet - has to relate to the implications they bring.

To suggest outlining a space which limits distractions, means materializing this space. (Immaterial concepts are also considered in this project, ref. section 4.3.1.) This also mean that such a construction represents visual and tactile impressions. It can also be a source of distraction. What is unwanted sensory information is eventually up to the user. To provide a zone with the aim to limit distractions can never do more than encouraging to protect oneself from constantly being the battlefield of messages` fighting for attention. Distractions lead into situations where choices are required. Should one follow up on the distraction or should one continue with the currant occupation? When distractions becomes intrusive, choices to remain with currant occupation might be very hard.

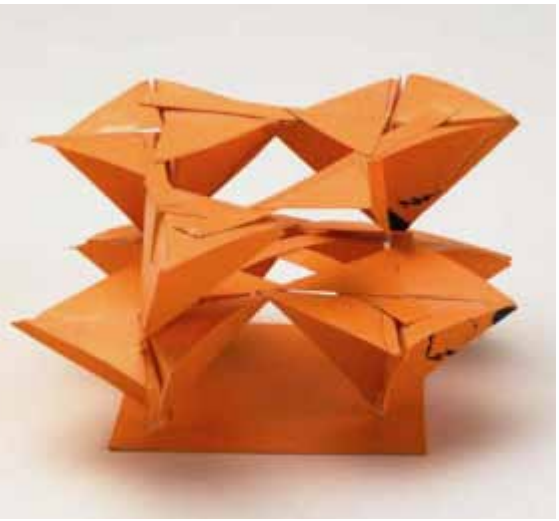
ill. 4: Typography of distractions with examples from daily life. the patterns in the background is to illustrate the circuits of sensory input and the internal reactions.
(A. K. Gaustad)



2.2. Choice overload

Freedom of choice is a value embedded deeply in the very core of western affluent society. And for good reason. It is an absolute necessity if one seeks to give the individual in a society the opportunity to unfold their life and possibilities according to inner motivation. Offering choices to enable people to influence the path of ones own life is still a actual purpose for two thirds of the worlds population. (Calculations from The World Bank from August 2008 estimates that 1.4 billion people live at, or under the poverty line of $1.25 a day.) Somewhere along the way in the pursue of offering alternatives and freedom of choice, this privileges becomes overwhelming. The fact that some choice is good does not mean that indefinite choice is better. This issue is explored in Barry Schwartz`s "The Paradox of Choice - Why More is Less". He writes: "Studies comparing the well-being of people living in different cultures have shown that substantial differences between cultures in the consumption opportunities they make available to people have very small effect on peoples` satisfaction with their life."

Jean Baudrillard puts it like this: "The goal of the economy is not the maximization of production *for the individual,* but the maximization of production linked in with the value system of the society". (Baudrillard, 1998) The maximization of choice is merely a side effect of keeping the value system running, and consumption becomes the citizens obligation. In his book "Manifesto for Silence", Stewart Sim attempts "a confrontation of the politics and culture of noise". Through pointing to disciplines where silence traditionally has been a virtue (religion, philosophy, visual arts, literature and rhetorics), he questions the wellbeing of the individual held up against the benefit of the society.



ill. 5: Model and sketch by Yona Friedman

ill. 6: "Merzbau", Hanover, 1933, by Kurt Schwitters

The French-Hungarian architect Yona Friedman`s is famous for his visions on city structures shown through The Spatial City concept designed during the 1950s. His vision was to create flexible structures for living residents which could be formed and easily changed by the inhabitants. In his opinion the job of the architects consist in providing the infrastructures that are neither determined nor determining (Nicolai-Dashwood, 2009) A line could also be drawn to the work of the German artist Kurt Schwitter and his living installations, named "Merzbau". By dynamically building, rearranging and adding abstract shapes to the rooms he lived he created extraordinary room experiences. A reconstruction of one of this installation from his home in Hanover built during 1933 was exhibited at Henie-Onstad Senteret in Oslo, January 2010. (ill.6) These are excellent examples of the concepts aiming to provide freedom of choice for the individual

to shape ones surroundings. But when these choices are overwhelming in so many areas of life from the possibility to build and rebuild your home (or at lest the interior), choosing insurance, customizing of shortcuts in software applications, choosing who to vote for in elections - . Robert Cialdini states in his book "Influence - Science and Practice" that "I have recently become impressed by evidence suggesting that the form and pace of modern life is not allowing us to make fully thoughtful decisions, even on many personally relevant topics. That is, sometimes the issue may be so complicated, the time so tight, the distractions so intrusive, the emotional arousal so strong or the mental fatigue to deep, that we are in no cognitive condition to operate mindfully." (Cialdini, 2009) Barry Schwartz says: "The benefits of having options are apparent in with each particular decision we make, but the costs are subtile and cumulative. (...) It is not this or that particular choice that creates the problem; it is all the choices, taken together." He suggests choosing when to choose.

2.3. Unplugged

To unplug is explained in the dictionary (New Oxford American Dictionary) with three areas of meaning: "to disconnect an electrical device by removing its plug from a socket, remove an obstacle or blockage from: a procedure to unplug blocked arteries, or informal: relaxing by disengaging from normal activity." The latter being the obvious one. The connotation of the past tense form unplugged is equally interesting: "music performed or recorded with acoustic rather than electrically amplified instruments." The first meaning relates to the electricity grid. The implementation of electrical power is often compared to the implementation of the internet. Nicholas Carr talks about this in "The Big Switch". Both technologies rely on a network grid, both are general purpose technologies who can be delivered efficiently over great distances and both over time establishes them self as absolutely relied commodity utilities. "Electrification, just like computerization, led to complex, far-reaching, and often bewildering changes for individual companies and entire industries - and, as households began to connect to the grid, for all of society." (Carr, 2008) The two technologies differ however in the implication of their presence. The digital era is characterized by simultaneous operations, immediacy, disposability, eventualities, subjectivity, speed and real time mass connection. To defend the human capacity of making choices in a landscape of such amounts and density information and choices is pressing challenges of the future. Eric Horvitz is a senior researcher at Microsoft Research. Already in 2000 he and his team worked with artificial intelligence designed to shield people from information overload while they are working.

To approach which benefits connected to a state less influenced by the social demand of being available it is conducted an in-depth interview with Svein Hovde (external supervisor) about his choice of not having a cell phone. (Rendering of the interview see appendix 3) The intention behind this interview is to explore which benefits one can find in not being available and which challenges it brings in our society. On question if he was willing to do this interview he says: "I have given this a lot of thought. It will be expected well formulated reasons why one should choose not to own a cellphone, compared to the choice of having one." Availability through a cellphone has over a time span of twenty years become a convention. On question which thoughts constitutes the reason for not having a cellphone, Svein replies: "Part of the reason consist in a self image as messy, absentminded. (...) Not only in a practical sense, for instance reading. To have a cellphone would be to expose myself for something that would make it harder to keep the thread. I like to get captivated by something. One further reason is irritation of enervating behavior in connection with use of cellphone. A lack of presence, absence. For instance I see children on the train who do not get attention because their parents talk on the phone. (...) It also involves what I consider virtues, good qualities: a slightly slower approach, less things simultaneously, concentration, engagement, fascination for depth within a narrow field of interest."
The ability to be present is the thoroughgoing element his reasoning. And a claim to attain the privilege of not being dictated to stay available. He also points at the phenomenon that availability as become an obligation: "In historical perspective it has become a obligation to stay available. In first phase when the cellphone was adapted it was considered weird to talk on the phone on the bus. During next phase this

was normalized, and next expected. If one does not have a cellphone one has to expect answering what the reason is. Today in many contexts it is a declared expectation, for instance to read mail while being on vacation. An employee in an interior architect firm who opposed this demand was fired for this reason." The interview also take into account the obstacles not having a cell phone gives. And there are many: Svein expresses that "The main problem is to expose oneself to the feeling of a guilty conscious socially, and in context of society in general. Society is organized in a way that requires a cell phone. It becomes a defeat to ask to lend a cell phone to give an important message. It turns out as a question of how difficult should make it for myself to keep a principle. Calling it a principle is interesting because it is a choice I consider natural. To not have a cellphone is radical compared to my choice of not having a car and drivers license. It is definitively the feeling of guilt that represents most pressure." The choice not to stay in connection requires persistency and determination. It is a question of endurance. To get people to not have a cellphone or not be available is not an objective. But it is an objective to show that periodical limitation of availability is beneficial.

3. Context and marked

3.1. Context

Since the starting point in this project is founded in a general phenomenon in society, choosing context has been a difficult point. The context of the home was chosen since there is not so much done in this area. Some examples are showed in the next chapter (3.2. Existing concepts). Still the home sphere is hard to work from because it is a context which vary so widely according to number of members of the household, size and lifestyles. In order to gain more reference points in the design process it was experimented with shifting into another context, namely that of an office. An office context is a much more institutionalized situation, with a clear purpose namely to provide suitable working conditions. In this context concentration and focus is a pursued value. There is also a lot of focus on recreation as a mean to decrease sick leaves. This debate is currently subject to public debate in Norway because of high public expenses compared to similar countries. Such a context would limit the area of use to mainly two functions: either (1:) a short recreational break: a place where you can take a power nap, be alone for some time, regain focus after an disturbing incident, or (2:) an area to withdraw in a sheltered environment to focus on demanding tasks. This context requires a more functional approach to the project.[1] It gives the product a more descriptive role: use this product in this way, for this long time, this area is assigned as workspace, etc.

The focus in this project is to limit distracting impulses from availability through communication channels. The problem is highly relevant in the work situation, but it is also a challenge due to the wide use of internet in many work situations. The problems concerning distractions in work situations is very different according to type of work that is preformed. The conclusion is that different work situations would need custom made solutions suited to the nature of the work. For this reason it was decided to keep working with the context of a home sphere.

The home is scene for many situations. Sometimes a place for recreation, sometimes social gatherings and other times work. For many people distracting impulses does not represent a problem in the home sphere or a set of headphones and music is what they need to unplug. To others however, staying connected to different degrees becomes an addiction. In the study “24 hours unplugged” conducted at the University of Maryland, scientists asked students to stay away from cell phone use and social medias for 24 hours and then to describe the experience in a blog. 200 students participated. Many failed the task. One student wrote: “I wish I did not cheat on this assignment by checking the e-mail and the phone, but the anxiety was in sane.” According to the scientists this can be defines as addiction. (Oksholen, 2010)

Silent rooms in the public room is a much more explored area. It has been a trend in the last fifteen years to include a silent room in public institutions. Together with student Ida Grindertangen it was developed a concept for a silent room for Akershus University Collage in module PDM pra. This work

1 During the time of the context change it was initiated a survey to map out possible sources of distractions in the working environment. (See appendix for survey form) The survey was sent to approximately 100 people, in four work places, tree in the private sector and one in public sector. 21 people responded and this is not enough answers to be presented as data material. But further the work with this survey was not prioritized since it was concluded to keep working with the home sphere.

3.2. Existing concepts

The idea behind this concept has emerged from a general trend in the way contemporary society is organized. It is developed for the home sphere. Even though the home is traditionally considered a personal dwelling it has lately has been widely invaded by societies demand of availability. It is done some research to map out existing products.

The wide use of modular systems in contemporary interiors might be traced back to ideas of Freidman. (ref. section 2.2.) “Clouds” by French the designers Ronan and Erwan Bouroullec are decorative textile tiles for creative exploration with volume. Quote from the web-site kvadratclouds.com: “ This simple design means that you can easily arrange and re-arrange the tiles to reflect your ideas and bring self-expression into your home, time and time again.”

ill. 7 : Clouds by Ronan and Erwan Bouroullec for the Danish textile producer Kvadrat

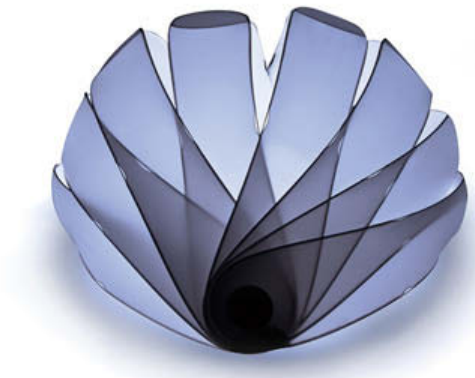
A Norwegian example is the collaborative exhibition “Visual noise - acoustic design i wood”. It was first shown at Beyond Risør and later at the Design and Architecture Center (DogA) in Oslo. It is an expression of rising awareness of the need for solutions for design that provide visual and audial shielding.

ill. 8: Products shown at the exhibition Visual noise - acoustic design: “Røys” by Permafrost and Katharina Styren

ill. 9: The fold-up sofa “Duo” made by former Norway Says for K.L. Hjelle was also shown at the same exhibition

ill. 10: Transport Perceptual Pod by Alberto Friaz

"Transport" (ill.) by American designer Alberto Friaz is integrated with lighting system, color kinetics, sound system and a water madras with temperature and motion control. It is available for 120 000 NOK. Illustration shows Markus Michalski´s indoor tent intended as "a private secret retreat, used at home or at the office."



ill. 11: Indoor retreat tent by Markus Michalski

Another product area which has been investigated during this project is the small, but growing marked of shielding products. This products as sold to people who experience symptoms from exposure to electromagnetic radiance from the electricity network or telecommunication signals. Another marked is are companies or people who conduct experiments or measurements, who are in need of a space without interference from electromagnetic fields. Electromagnetic fields will be further investigated in next section 3.3.- 3.5. Electromagnetic fields). Some available shielding solutions in illustration

ill. 12: Shielding baby basket sold by wireless-protection.org

ill. 13: Shielding coat sold by lessemf.com

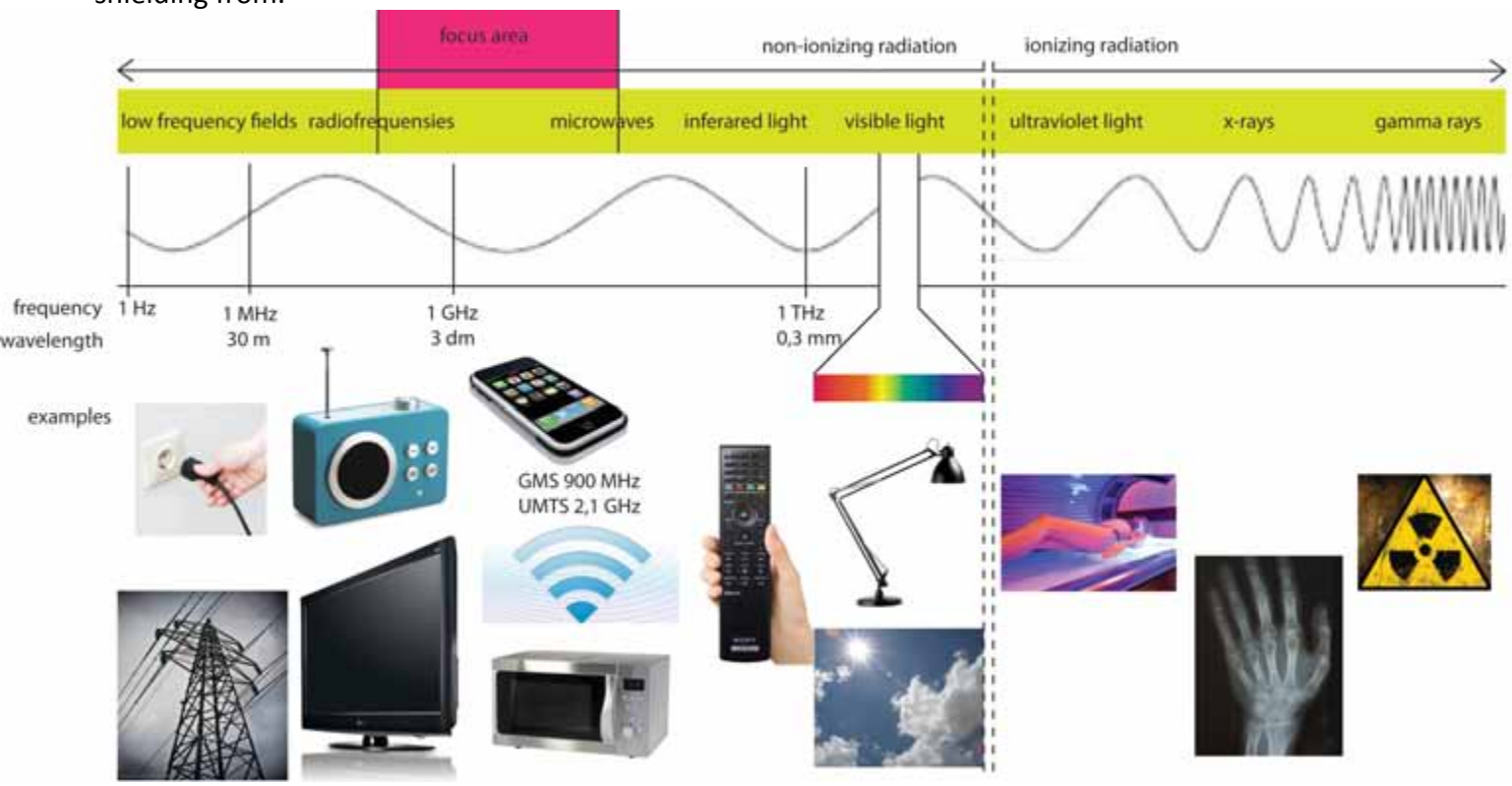
ill. 14: Head and shoulder protection sold by rkt.se

ill. 15: Faraday-tent for experiments and measurements sold by Holland Shielding Systems

ill. 16: Canopy for doubble bed sold by rkt.se

3.3. Electromagnetic fields

Electromagnetic fields are all around us. Even light that enable the human eye to see, is electromagnetic radiation. Different frequencies of radiation is used and arise in various natural and human created activities. In the high end of the electromagnetic spectrum lies the ionizing fields (ultraviolet light, x-rays and gamma radiation) which can be harmful to the human body. They are not our concern in this project. Nor is infrared light and low frequency fields. Due to their ability to turn electromagnetic waves into sounds, pictures, text etc., it is the radio frequencies and microwaves that it will be prioritized to provide shielding from.



ill. 17: Overview electromagnetic fields, radiation from telecom industries has frequencies between 900 MHz (GSM 900) to 2,1 GHz (UMTS - Universal Mobile Telephone System), while wireless networks use frequencies between 2.4 to 3 GHz

Signals from cellphone networks are in the high-frequent end of the radio frequency spectrum, while wireless networks go close up to the microwaves. According to Kåre Lind at Justervesentet (Norwegian Metrology Service), a coverage of frequencies up till 3 GHz will shield from telecom signals. A space like suggested in this project will need to be electrically conductive all around the unit to secure shielding properties. Lind estimates that “leakages” (a nonconducting slit) at 5 cm will allow signals to enter in. 5 cm equals half of the wavelength of signals at 3 GHz (approx. 10 cm). Since the goal in this project is to avoid distractions, it is chosen not to focus on shielding from lower frequencies which does not carry signals enabling audiovisual information. Low frequencies are also very hard to shield.

To enable shielding from radio waves and microwaves it is necessary to use the principle that Michael Faraday showed in 1836 by building an enclosed room coated with metallic foil. By allowing high-voltage charges from an electrostatic generator strike the outside of the room, he proved that there was no electric charge on the inside of the room´s walls and volume. The Faraday cage effect can be explained through Gauss’s law that states that if there is no charge in a closed surface then the net flow of electric field from the surface must be zero. (Rubin 2009) To use the Faraday cage principle conductivity is required all around the unit. In order to attain the Faraday cage effect we need to use electrically conductive materials in the unit. Most metals are good conductors and can also appear integrated in other materials. Carbon is an example of a non-metallic material which is conductive.

3.4. High frequency fields and health

Concerns are related to the physical effects of exposure to electromagnetic radiance of high and low frequency waves. Though intolerance towards electromagnetic radiance is not constituted as a diagnosis, a growing number of people report of allergic-like reactions from exposure to low frequency fields, (electrical power grid, ref. ill., page) or high frequency fields (radio waves and microwaves). Ph.D. Olle Johansson, a researcher at Karolinska Institutet (Department of Neuroscience) in Stockholm, refers to survey studies showing that somewhere between 230 000 - 290 000 Swedes report a variety of symptoms related to such exposure (Johansson, 2006) However there are great controversies concerning risks of exposure to electromagnetic radiation. National authorities are often being accused of letting tight connections to the telecommunication industries colour their research. The polarized climate in the debate can be seen in the anticipation of the finalized report from the Interphone, a multi national research project conducted between 2000 and 2007. This is a collaboration between The International Agency for Cancer Research (IARC), Center for Research in Environmental Epidemiology (CREAL) and International Union Against Cancer (UICC). Conclusions are not yet published and critical voices claiming that the financial support from the telecom industries influences publication of unwanted findings.

The Norwegian Government announced in a press release from November 17th. 2009 that there is established a cross disciplinary team of experts who is going to do an exposition on exposure from electromagnetic radiance. (Regjeringen.no) The team consists of representatives from Helse og Omsorgs Departementet (Ministry of Healt and Care Service), Statens Strålevern (Norwegian Radiation Protection Authority), Post- og Teletilsynet (Norwegian Post and Telecommunications Authority) and researchers from Norwegian and Swedish universities. According to contact with Merete Hannevik at Statens Strålevern (Norwegian Radiation Protection Authority) it is in these days conducted measures in Oslo, Bergen and Trondheim to map the levels of everyday radiation on different frequencies.

It will not be concluded on the physical risks related to exposure to radiation from cellphone signals or high frequent waves from wireless networks in this project. It is acknowledged that the exposure represents possible harmful effects on health, but it is not the objective in this project to conclude on this effect.

3.5. Future scenarios

To approach the user of the concept it is created some fictive future scenarios with matching user profiles. The aim of this approach is to evaluate the relevance of the suggested concept in light of an imagined future. These scenarios have starting point in a rough sketch of technological development and describes different living conditions in Norway in 2025, descriptions of users living this way and a description of their online habits.

Technological development
Online crime represents a treat to public and personal security and widely argued regulations of public storing of movements on the web is allowed by legislation in 2015. However after technological breakthroughs in securing personal data on the web by DNA reader, cloud computing becomes a commodity service. Companies facilitate subscription based services of online connection, applications, storage capacity on demand from large server plants. The clouds provide reliable services and connection problems hardly ever occurs due to advanced back up systems. A term used by mercantile businesses says: "Tell me your web subscription and I will tell you who you are."
The introduction of cloud computing standardize a merge between the personal computer and cell phones as a device in sizes between 3,5 to 12 inches, single screen or notebook format. This device is used for holographic communication and access of cloud profile. At home or at work the device is often connected to a work surface like a touch screen tabletops or wall-hung screens for larger views, working, gaming, virtual social encounter etc.

3.5.1. Scenario Container living

A increasingly popular way of living in big cities is to buy a container home which might be settled in reserved areas close to infrastructure like harbours or train stations. The flexibility makes it easy for adventurers to move often and exploring new places. The free float of workforce within Europe has expanded to all of Europe, while negotiations between EU and North America to achieve the same here fail. Many people living this way however are people that can work from their home office, students who can follow online education and it is increasingly popular among retired people who wish to see more of the world. This phenomenon becomes a melting pot culture, a lifestyle with international influences and awareness of the positive sides of coexisting diversity and cooperation. In Bjørvika the first container living facility is established in Norway.
Seo Young Park and Monique Frank met during studies in Rotterdam. Since both wanted to travel for the next years, they decided to share a container unit. Seo Young works as a developer for a the computing facility Matrix a daughter company of earlier Telenor. Monique is studying public management, specializing within health care services. Current location is Bjørvika Harbour where their container will stay for four more months before shipping to Cannes in September and Tokyo in January. Both are active members of

ill. 18: Illustration container living facility

the container living community keeping in touch with old and new friends. Monique subscribes to an online tutor application where she follows lectures from several universities, accesses libraries and delivers assignments, she subscribes music player and recording application and an e-book account. Seo Young uses a employer supplied free profile according to her work as a developer. This makes work accessible whenever online, however her profile is supplied whit a “not at work” mode. In her spare time she is an eager film enthusiast and member of several movie communities. She also uses a shopping assistant search application and travellers gps guide.

3.5.2. Scenario “Himmelblå” (Norwegian for “Sky blue” after the popular NRK television production)

After the elections in 2025 the conservative parties pushed through a decentralizing of authority from the state to local governments in the communes. As a result many small communities in rural and remote areas provide attractive conditions for citizens to leave the urban life behind. The trend of seeking a more quiet life and “authenticity” through focus on ecology and short travelled products appeals to many people in a time of many natural disasters. Idealistic people grasp this opportunity and several former desolated fisher villages along the coast become self supplied communities based on model from medieval guilds. The trend however have to withstand some criticism for being a upper class phenomenon of the reason that majority of the people moving from the cities are those with the privilege of a flexible job situation. Even though buying property in this areas is not to expensive, it is reserved those with this generally desired privilege.
Ruth and Pierre Samuel. Pierre used to work as art director in an advertising company while Ruth used to work as doctor work at Ullevål Hospital. The couple has always spent a lot of time outdoors and are active hikers. When the opportunity of moving to Bjørnsund, an old fisher community on an island group far out in the open sea coast in Møre og Romsdal emerged, the couple decided to make reality of this dream.
Ruth has set up her practice and serves this small community, supplemented by providing online medical consultance. Pierre works part time freelance while pursuing establishing himself as a photographer.
The couple ironically needs an expanded subscriptions which is extra powerful due to their location. Ruth uses a entrusted medical application which is designed to provide privacy during online consultation with patients. They do al their shopping, news overview search application, weather forecast application and gps including hikers routs and sea maps. They edit their web presentation profiles and Pierre subscribes for the picture editing package.

ill. 19: Bjørnsund was desolated *for six decades from 1970 with activity only during the summer. From 2019 an increasing number of households stay round-the-year.*

3.5.3. Scenario Urban village.

The population growth between 2015 and 2025 has made former medium sized cities specially in eastern Norway into bigger cities. Skien, Porsgrunn, Larvik, Sandefjord, Kongsberg, Drammen, Sandvika, Ski, Lillestrøm and Kongsvinger all become cities with around 100 000 inhabitants. Massive city development take place in the areas surrounding these cities during the period. The villages are recognizable by their high density residential areas with small planned forests in between. Many of these villages succeed in establishing local businesses in the new marked. An important premiss for this development is the heavy investments in infrastructure in the region. High speed inter city trains and corresponding electric busses makes commuting from the villages to work in these connected cities and Oslo more attractive.
Patrick Chamal and Susanna Person lives in Steinsrød Village outside Skien in a village complex. Susanna works as editor of the page visitnorway.com, working partly from her home office, partly from Sandvika. Patrick is the a merchandiser of a local distributing hub of a chain selling groceries on demand. The couple have two children Alex and Amadine, both in school age. The family plays an active role in the local community. They use a family subscription with a parental control application, the children uses a homework aid, holographic gaming and chatting application. Susanna uses text editing, lay-out program, holographic conference application, while Patrick uses a logistics application and he uses a 3D lounger application for downloading products for printing. The family also uses an application that controls the levels of radiation of they are exposed to in their home.

ill. 20: Illustration urban village.

3.3.4. Sum up

Even though these scenarios are fictive it is unlikely to underestimate the importance of the future development in information and communication technologies. It might seem overrated in the sense that these technologies will be such an integrated part of everyday life. It already is today. Never the less the problems defined in this project is more relevant than ever in future scenarios like the ones suggested here. People living in constant relation to a contact surface extended to include the entire world`s population and the entire body of human knowledge, need tools to navigate from. It is reasonable to believe that one key is to be present in the actual environments.

4. concept development

4.1. Idea phase

To initiate the work with generating ideas, a list of ways of influencing through design was utilized. This was a list which was developed in the module PDMK 4300 Emotional Structures. This work was done in cooperation with Emilie Antonsen and Karoline Sandes Bommen. The list was developed from Cialdinis principles of influence. (Cialdini, 2009):

- Enhance liking: to offer “a gift” in addition to the expected
- Enhance liking: give the product or service features that encourage relations and cooperation
- Enhance liking: give the product or service features that encourage activity
- Scarcity: make the product exclusive, limit availability
- Inner consistency and commitment: provide the product with values like environmental considerations, community causes etc.

From this list it was worked out some ideas on which principles of influence could be applied to convince people of the relevance of this concept:

- Liking: additional “gift”: offer possibility for customizing of the product
- Liking: user activation/additional “gift”: feature the space with an extraordinary experience, the idea of entering into another world: room experience/visual effects: kaleidoscope, music or sounds: sound shower
- Liking: “people like me”: easy recognizable product, “people like me” who cares about “unplugged-ness” how is this group identified? By white colour, snow and clean lines? Bauhaus? Meditation, religion, arts? or “people like me” who are so are disturbed so intrusively. Identified by a very busy schedule and a lot of network of friend and connections or “people like me” who are easily disturbed. Identified by perceiving them self as absentminded, that small distractions can lead to distraction from work.
- Inner consistency and commitment: appeal to the feeling of responsibility of working efficiently
- Enhance liking through offering relationships: an “unplugged” fellowship
- Scarcity: have to deserve to use the product, to be “chosen” for a reason or by chance, must be given the opportunity to use the product.

One design demand that emerged from this idea phase is that the room need to enhance an extraordinary room experience. A feeling of entering into another world, - or escaping this one. A mood board was made to illustrate this idea. (ill. page 28-29) On this back drop concept sketching started.

To categorize idea sketches they were put into a matrix (ill.) with two parameters; degree of shielding properties on one axis and focus on enhanced concentration levels/focus on break related activities in each end of the other axis. This was done during the period while it was worked towards an office context. On the first axis it was concluded that it is desired to achieve a relatively high degree of shielding. This means visually to the degree that some outlook is attained since it is psychologically essential for human beings to have a feeling of overview. Small space can easily be experienced as closed and claustrophobic if the materials are too opaque. When it comes to shielding of sound the degree might be somewhat lower. It is important for keeping a feeling of overview to be able to hear the outside, but dimmed, in this area as well. On the matter of shield from telecom signals, a highest possible degree is desired within the frames of the other demands.
On the other axis this matrix made it clearer that it is not wished to either focus on enhancing concentration or on break-related activities. These are two groups of activities that is possible in a sheltered zone. Other than that it is pursued not to instruct the user. A personal space should not be made for one specific kind of use. This would undermine the basic idea namely to outline a free, where one can actually act uninstructed. The reason for entering the room must lie in the user.

ill. 21: Brainstorm sketches put into function matrix

ill. 22: Illustration of the concept of entering another world

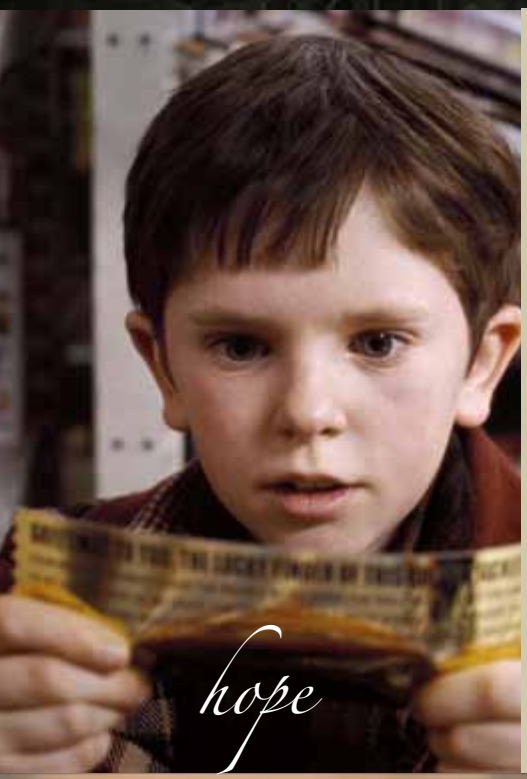
impressions

entering another world

colour

foreign places

ill. 23: Illustration of the concept of escaping reality



4.2. Shielding materials

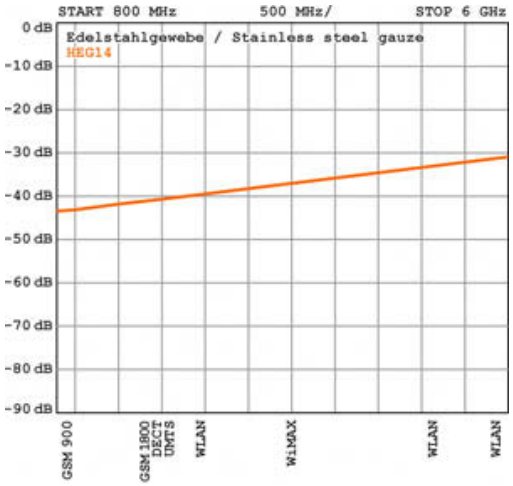
To make the product shielded against telecom signals different materials had to be evaluated for tha concept.

Metal plates and meshes
Metals constitutes an obvious material option because of the good electrically conductive properties. However metal plates gives an closed impression. Metal plates also represents a great challenge when it comes to keeping full conductance in the joints. Copper and steel alloys are often used in building Faraday rooms in hospitals or laboratories for testing of equipment and other rooms were it is essential to avoid interference from electromagnetic fields.

ill. 24: Details from at the measure labs at Justervesenet

ill. 25: Prefabricated Faraday cages can be bought from Holland Shielding Systems

Meshes is also possible to use. These provide flexibility and relatively good shielding performance. This diagram (ill.) shows the shielding performance of a fine stainless steel mesh from the German company Yshield EMR Protection. The product is non-flammable.



ill. 26: Shielding performance Y-shield stainless steel mesh

Coatings
Several producers deliver paint with conductive particles like carbon or copper. Examples of such producers are Caparol Sverige AB and Yshield . According to consultance with Bente Gilbu Tilset senior advisor at Sintef (Department of Materials and Chemistry) it is little to gain in physical properties from these kinds of paint to nano coatings which are significantly more expensive. Thereby it is not conducted further research on nano coatings in this project.

ill. 27: Caparol Electro Shield: Shields frequencies between 200 MHz and 10 GHz. At 36 dB the sheilding preformance is 99,98 %. This paint contains copper and silver particles.

ill. 28: Yshield Shielding Paint HSF54: Containing carbon particles. Sheilding preformance 99.98 % when exposed to signals at 36 dB.

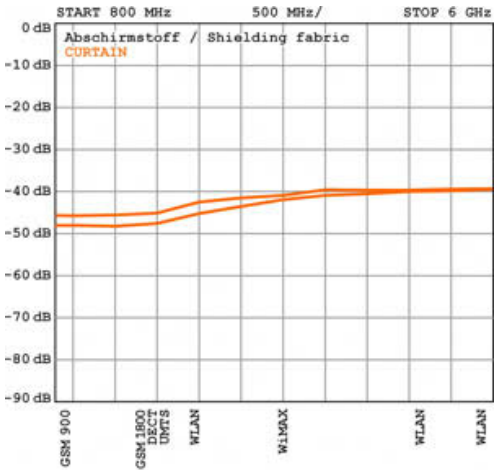
Window film

Window films applied on transparent or translucent surfaces is one alternative way of shielding which is available. They are made with extremely fine woven meshes of stainless steel inside. They can exclude up to 32 dB between 900 MHz and 6 GHz. However this is seldom enough to shield to an acceptable level.

ill. 29/30: Film for shielding of glass surfaces can be bought from Holland Shielding Systems (left) and Ysheild EMR-Protection (right)

Textiles

Fabrics with treads of copper, silver or nickel woven into them is the alternative that represents the strongest shielding properties. The ones with nickel are mainly used inside walls in building construction and is not considered further due to the fact that many people suffer from allergic reactions from this material. The most shielding fabric from Y-shield is called Curtain and shields up to 47 dB at a frequency of 1 GHz, and approx. 42 dB between 2,4 and 6 GHz.



ill. 31: Shielding performance fabric "Curtain"

Conclusion on shielding materials

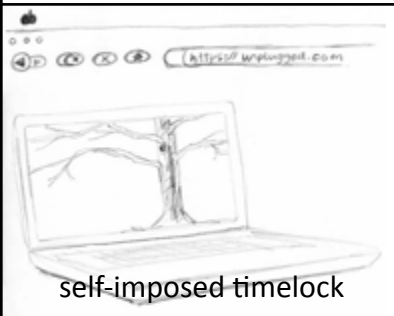
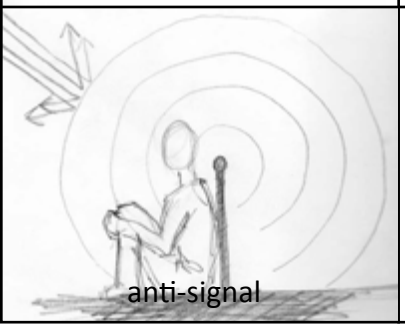
All the materials have been taken into the idea phase of the product development. But due to their relatively high degree of shielding and form flexibility, textiles and meshes however, has been concluded the best way of shielding. Using plate materials applied with paint or window film, it would be very hard to avoid leakages in the joints and the entrance. It would also make it difficult to make the structure collapsible.

Some research was done on the feasibility on finding suitable shielding materials before the concept was decided on. However the project is founded on an assumption that this materials actually does what they promise. The shielding materials does shelter from radio frequency waves, but to a limited extent. The shielding performance depends on the strength of the signals. The signal strength varies depending on distance to the sender, how many senders one are available to, angle from the sender, the performance of the receiver and so forth. This knowledge is gained through the research. It was concluded to keep working with the intentional idea. Even though it will not always provide full shielding, it will weaken the signals considerably and be associated with an unplugged area.

4.3. Concept suggestions

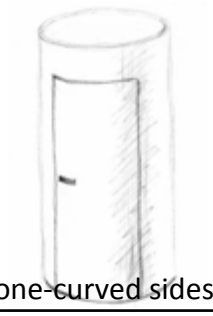
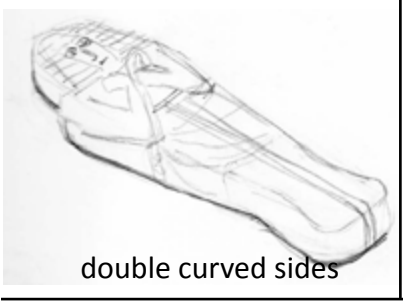
To try to cover a wide range of possible ways of building up the structure they has been put into three categories: non-material “structures” (concepts), self-supporting structures and (textile) structures supported by inner framework. Concept suggestions are presented in the different categories.

4.3.1. Immaterial “structures” (ill.)
A concepts in this category could be a web page where you sign in and define that you would like to lock your web access for a period of time. This solution might work well for people who need a reminder that breaks from work or online activities are necessary. However it focuses on a limited user situation and it is only to some extent changeable according to user needs. It was chosen not to develop these immaterial concepts further.

structural principle	product example/s	pros	cons
 self-imposed timelock		- a reminder that you you might need a break - easy access from the current place of distraction	- you have to activly choose to go this web site - only a limited array of distractions, namely those related to internett access - little visual or sybolic value
 anti-signal		- flexible - takes no space	- don´t know if it is possible... - little visual or sybolic value

ill. 32: Principle overview: Immaterial “structures”

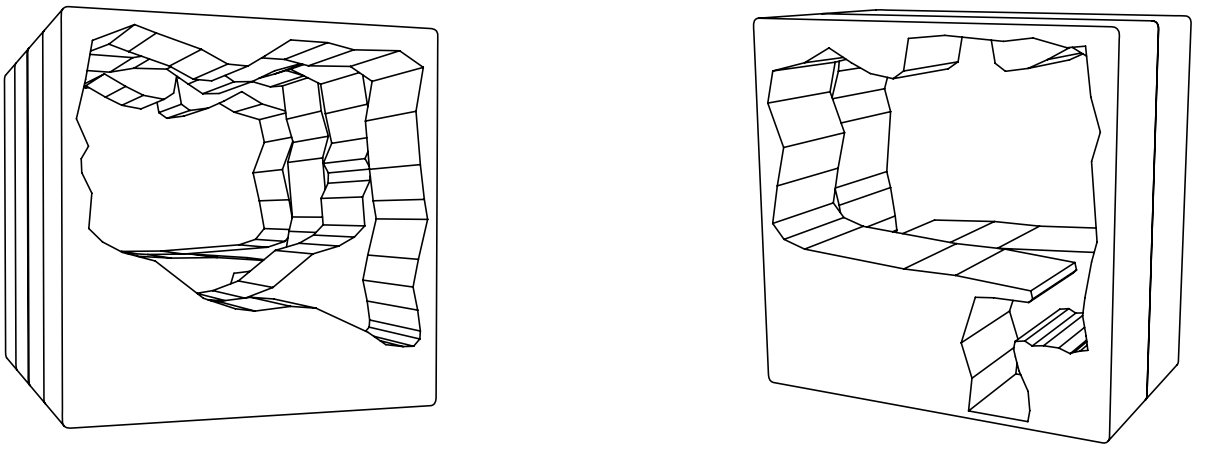
4.3.2. Self-supporting structures

structural principle	product example/s	pros	cons
 plane sides		- flexible - can be foldable/expandable according to wished size	- ordinary room experience (can use other features to make it less ordinary) - big and rigid in storing - conductance between plates challenging
 one-curved sides		- different room experience - surrounding, conductance not to hard	- uncollapsible, big to store when not in use
 double curved sides	 	- flexible; good opportunities for development of different form vernaculars from this principle - surrounding	- claustrophobic (could be made bigger though) - entrance - can be difficult/expensive to produce

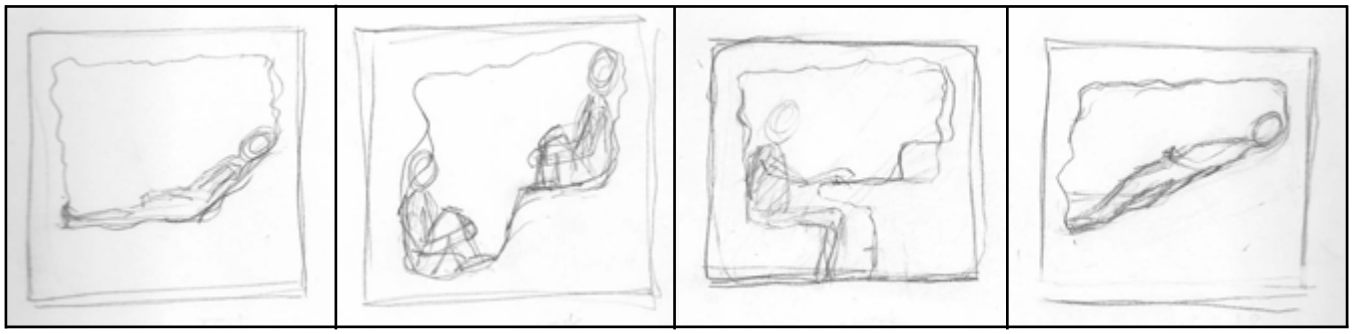
ill. 33: Principle overview: Self-supporting structures

The following concepts all fall into the first structural principle within this category, namely “plane sides”.

Concept “Slices”
Within the category of self-supporting structures it was worked with different concepts. One concept by slices of material with an extruded hole through it creating room inside. This concepts was developed during the period when it was worked towards the context of a working environment, thereby the working surface. The idea was to be able to use only one module at the time or stack them together depending on the need. To achieve shielding from the outside walls, a solution for side covers is needed.

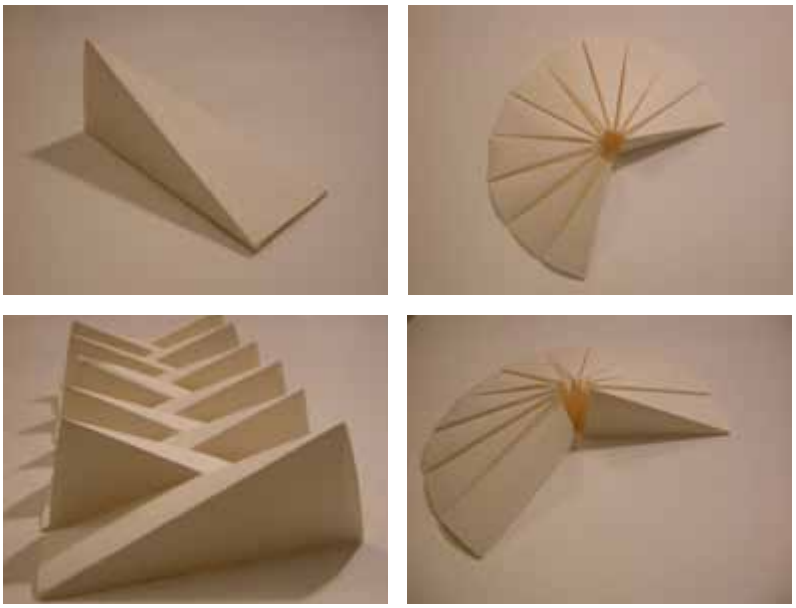


ill. 34: Visualizations of concept “Slices”



ill. 35: Sketches in use

Concept “Folding”
Another concept was developed from a line of form experiments folded in paper. The starting point was triangles with two alike sides. Arranging them together gave architectural shapes. (ill.)
The next illustrations (ill.) shows shapes with an increasing number of triangle shaped sides. The system could provide separately sold sides, and the user could buy the needed amount for the desired constellation.
The concept would need a solution for floor, roof and entrance. It was attempted to work with solutions for the roof that made the room experience more interesting. (ill.)



ill. 36: Paper models. Starting point was this four sided shape of triangles and constellations of the same shape



Eight triangles


Ten triangles




Twelve triangles

ill. 37: Paper models folding concept



Roof construction from inside and outside

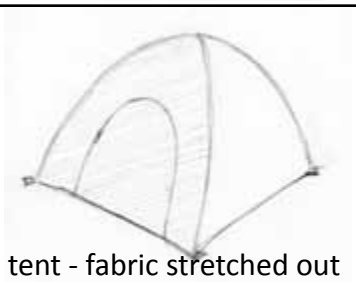
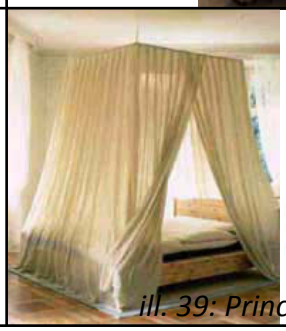
This concept was abandoned because of the difficulties joining plane surfaces gave. To ensure conductivity between the planes and between the walls, roof and floor in a structure in metal or for example glass/plexiglass coated with film would be very hard.

It was experimented further with folding using plissé technique. This made architectural shapes, easily foldable. The shapes consisted of many planes and thereby many joints which means a lot of possible leakages of signals. During the work with this models, attention was brought to their ability to create different room experiences.



ill. 38: Paper models folding concept, plissé technique


4.3.3. (Textile) Structures supported by an inner framework

structural principle	product example/s	pros	cons
 clothing - fabric using the body as inner structure		- can be used anywhere - no installation	- difficult to avoid limiting vital functions like vision, hearing, hands, freedom of movement - does not make a feeling of entering another world or escaping reality - no feeling of space
 umbrella - fabric stretched out from point		- easily collapsable/stored and put in function - good conductance in the parts that is in one piece	- limited shielding; requires solution for downside/ conductance
 tent - fabric stretched out between several points		- flexible; good opportunities for development of different form concepts from this principle - has a downside	- requires a good solution for the entrance (conductance)
 canopy - hanging from point or frame		- can be used over different areas, bed, workplace, comfortable chair etc. - easy to store when not in use	- needs to be fastened to the roof - requires solution for down-side/conductance

ill. 39: Principle overview: (Textile) Structures supported by an inner framework

Concept Yarn Winder

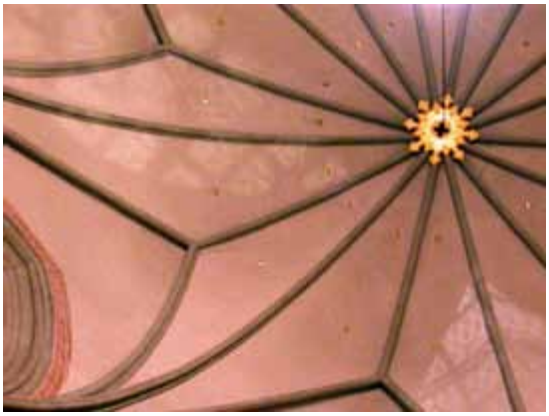
In the category of structures supported by an inner framework, in this case textiles, a concept was developed with direct inspiration from the yarn winder. The wooden mechanics in the top creates a nice room experience. There could be more “arms” than the four shown in this picture. This concept is easy to fold together and takes up little space when not in use. When it was chosen not to work further with this, it was due to the need of support to keep it up raised. This could be solved by putting it on a rod with a stand. This would be a disturbing element in such a small room when being inside of it, or if one would like to use some kind of furniture inside. It could also hang from the roof, but this is something that is attempted to avoid. It requires well secured installation work and a solid roof.

ill. 40: Visualization of concept yarn winder

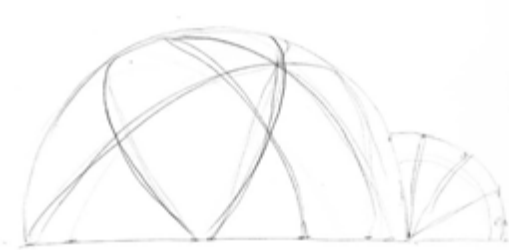
Concept Globe

It was also attempted to build a concept inspired by globes and dome constructions. Even though the starting point is in self-supporting structure, the idea was to transfer this idea into fabric supported by rods (tent structure). The globe (or the upper part of a globe), has a sense of calmness and stability which are desired attributes in this context.

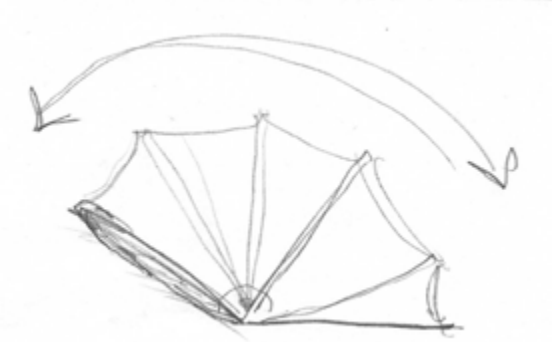
ill. 41: Dome structure: Traditional igloo made by the Inuit people



ill. 42: Dome structure: The roof of Trefoldighet Church in Oslo



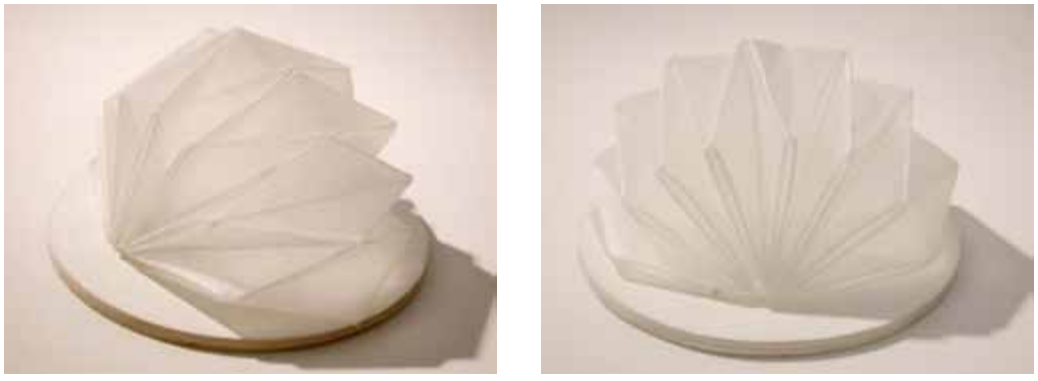
ill. 43: Sketch of dome shaped structure supported by multiple rods of half circles



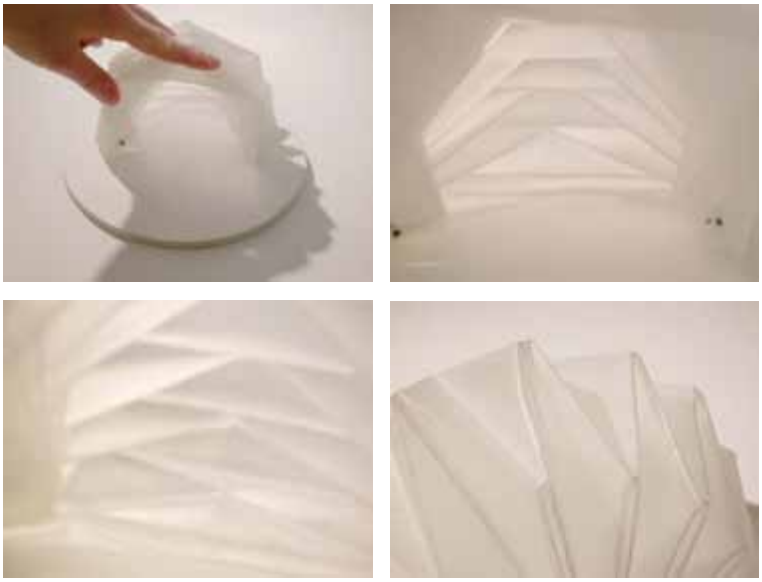
ill. 44: Sketch of foldable structure similar to spray hoods used on boats, open cars etc.

4.3.4 Concept merge

Through the work with this idea it became natural to explore merging this idea with the plissé technique since it allows creating domelike structures. (ill.) The idea to make the structure in a laminate with two layers of textile supported by foam plates in between was an important turn. Laminating so that the fabric becomes a hinge between the plates of foam gives a self supporting structure with good conductivity where the plates meet. This way of building up the form makes it in the boarder line between the suggested categories; it is made from non self-supporting textile, but made self-supporting by the properties of the two materials put together. To explore further the way of building up the form it was made a model calculated to represent approximately 1:5 of real-life size. The 1:5 scale model was made from polyester fabric and thin (6 mm) sleeping mats cut into 85 pieces. This was to see if the



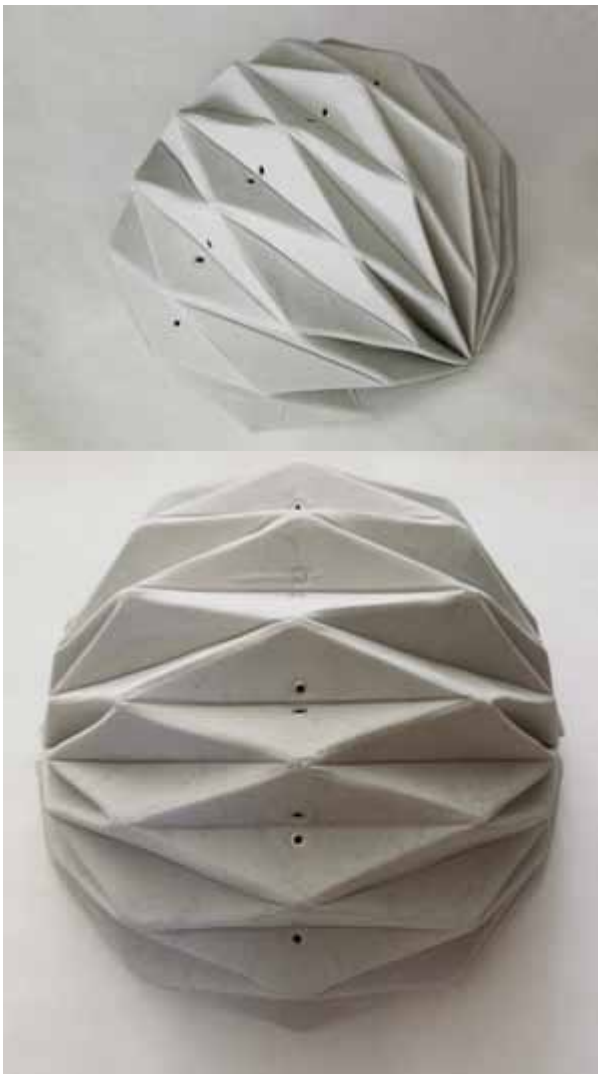
ill. 45: Model made from thin polypropylene sheet to explore the shape in translucent material



ill. 46: Foldable structure, can be used either the enclosed or as 1/4 of a globe (up to a wall) Details from the inside and outside of the roof

transformation from one-layered paper/plastic sheet to laminate of textile and foam plates worked. The initial intention was to sew the lines between the foam pieces in the hinges. This was difficult due to the height differences and little space for the foot on the sewing machine. Next step was trying to use spray glue. The structure does provide the needed material spring between the foam pieces to hold it upraised. It also had very good self supporting properties without really having a separate supporting structure.
The ideal way of concluding on the suggested concepts would have been to make mock-ups in real-life size and talk to potential users. The central issue to discuss with users would be the experience of the room. This is not easily illuded in a mock-up. It was decided work further with this concept merge, due to well functioning construction principle and the opportunities of interesting room experiences it provides.
to draw a conclusion which concept to develop further and explore the user`s room experience from this model. The structure is soft, but still robust. This are suitable qualities in a home context. The fact that it is foldable makes it easy to store. This argumentation was intended to be tested by analyzing interaction between user and a concept model.

ill. 47: Testing of foldable globe structure



ill. 48: Model approx. scale 1:5 Eyelets were applied to hold the structure when folded

4.4. Further development within the chosen concept

Light transmission and material spring was crucial factors for this concept. To keep the wished distant awareness of the outside, and at the same time use light from the surroundings (when possible) it was important to find materials that let light through. It was established contact with Roy Floberg at NMC Norway and received material tests of different densities of polyethylene foams. The material is in its natural form translucent and greyish in colour, but after the foaming process it occurs white. Tests where conducted to view the translucency. Even in afternoons and evenings the material provides good light transmission. Finding the right material to ensure illumination of the structure and at the same time provide the needed material spring was a key to the further development.
The illustration (ill.) shows two densities that NMC could provide. Left is Ethafoam 200 and Cellu Float. Cellu Float has lower density and lets through more light. The difference is not substantial though. Due to tests of the material spring in Cellu Float (ill.), it was concluded that this was the right material.

ill. 49: Spring testing: Cellu Float 10 mm height with:
(left)10 mm distance between pieces
(right) 15 mm distance between pieces
10 mm provides substantially more spring

ill. 50: Light transmission testing: left is Ethafoam from Dow and right is Cellu Float

4.5. Model building

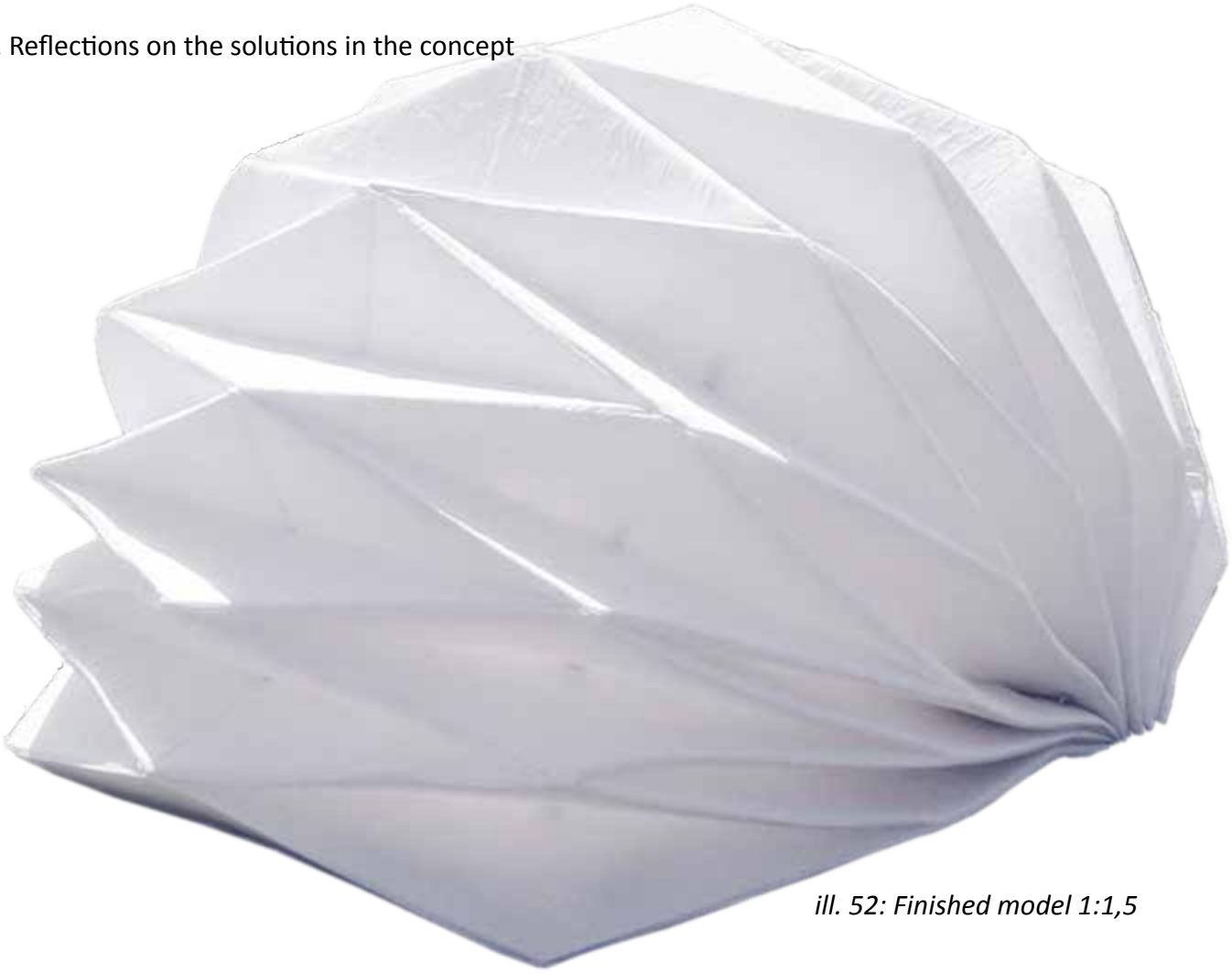
The material costs of making a full scale model provided an unforeseen problem. The dimension of the material (2000 x 1000 mm) did not allow good material exploitation, and the foam alone would exceed 10 000 NOK. This was not possible within the frames of the personal budget of this project. It was decided to make a model in scale 1:2. Even though the room experience will not be fully representable, it will be possible for people to experience the unit closed from the inside. Due to high costs of the shielding fabric this was not included in the model. It is meant as a visual model. The function of the fabric is shown in a separate material demonstration. (ref. section 4.7.1.) Next page shows the bulding process of the model (ill. 51)

ill. 51: Model building

Cutting and preparing

Gluing and placing the pieces in pattern on the textile

Second layer of textile - and sewing of edges



ill. 52: Finished model 1:1,5

ill. 53: Folded and fastened to the wall

ill. 54: Closed in 90 degrees between wall and floor

4.6.1. Material spring

A disappointing discovery when folding up the structure was that it, despite testing, did not have quite enough material spring. It holds the structure up, but it gets heavy on the sides of the structure. This makes the distance between the folds uneven. However this is possible to fix by adjusting three parameters:

- Using a higher density foam
- Using less distance between the pieces
- Using a less elastic fabric

The textile used in the model is a polyester and cotton mix (70/30 %). The cotton gives the material some degree flexibility which is not desired because gives the construction a weaker spring effect. In production a 100 % polyester textile would be used. Due to a more efficient way of making this product in actual production, the distance and foam density would require new rounds of testing.

4.6.2. Light

The light conditions in the model works very well. Even when the light is dim in evenings, a lot of light comes through the walls. The light gets spread and is enforced by reflection in the light material.
When it is no light on the outside a light source must be brought inside the unit. It is possible to use a lamp inside as velcro connects the walls and floor.

ill. 55: Inside atmosphere in daylight

4.6.3. Acoustics

Sounds from the outside are not excluded, but the acoustics are dimmed by the insulating property of the polyethylene foam. This creates a feeling of being set apart from the external environment and gives a shielding effect.

4.6.4. Folding and fastening solution

To keep the structure together when folded, it is used elastic bands through eyelets. The eyelets on the inside of the structure is put on a textile band to avoid signal leakages. On the sides the eyelets go through the laminate since it is folded together tightly. However in further development it will be tested to put these eyelets on textile bands as well.

ill. 56: Folding details and fastening to the wall

4.6.5. Floor

A floor is necessary to keep conductivity around the unit. It is made from two mirrored surfaces. The design of the floor was intricate because the surface shrinks (width) and stretches (length) from when it is expanded to when it is folded together. (ill.)



ill. 57: Floor test; the width of the floor surface changes dramatically from expanded to folded together.

This is solved by making a central piece in foam and edges in fabric only. The edges are fastened to the walls of the structure with velcro. Velcro and material overlap ensures conductivity and easy exit in case of emergency.



The two halves are fastened together by velcro. Foalded structure

ill. 58: Floor details



Fastening between floor and walls, also by velcro

4.6.6. Ventilation

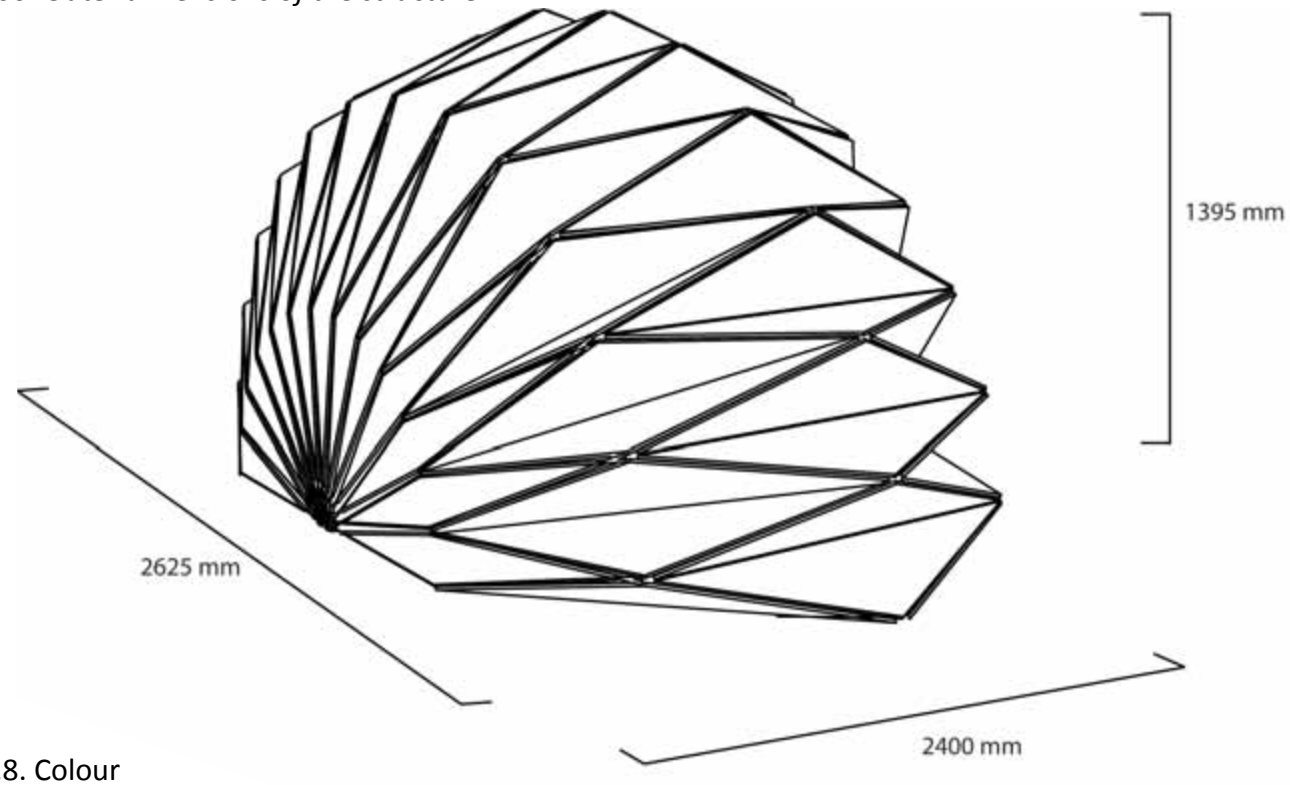
The model is supplied with two ventilation plates. One close to the floor and one close to the top. This is to allow warm rising air to come out and keep air circulation. User testing with one person resting inside for half an hour showed that more ventilation is needed. Further testing is required in this field. It is possible to make the ventilation plates more perforated then it is on the model, or increase the number of plates. This is a scale model. In real size the volume inside would increase, and the air accordingly the. If the size of the structure is doubled, the volume the of the air is multiplied by factor eight. However it does represent a challenge that the polyethylene foam is not not breathing.

ill. 59: Ventilation plate

4.6.7. Dimensions

The model was calculated to represent a 1:2 real-life scale. The reason for the measures was to ensure that a person at 2,20 m height could stand inside. Standardized roof height 2,40 m defines the maximum height. However after building the 1:2 model it was concluded that it was necessary to scale down the real-life product to keep it possible to handle. Even with intentional height 2,20 m it would be difficult to do activities that require a lot of space and movement inside. It would also take up a lot of room in a home environment. By this re-scaling the use is limited to sitting or lying activities with an internal height of 1,42 m. It is no problem sitting at a small working (standard height 70-75 cm) inside. The model represents 1:1,5 of real-life scale.

ill. 60: Outer dimensions of the structure



4.6.8. Colour

Colour either in the fabric or in the foam is considered, but not used since it allows less light through. Some of the plates could be exchanged with coloured polyethylene foam, but since it is a lot happening in the form it was decided keep it white. This is assumed to be a good choice because of it´s cultural associations to cleanness and empty snow landscapes.

4.7. Production

4.7.1. Alternative textile materials

The intentional idea was to use an inner a shielding fabric and use another material on the outside due to the relatively high price of the shielding material. (PE plates in between) However the fabric which the best shielding properties, is knit, which makes if flexible in all directions. This is no good in this construction principle, which depends on stability to avoid that the material stretches in the folds (the “hinges”).

This other material should be made from Trevira CS fibers to ensure fire-retardants. Trevira is a trademark producing polyester fibers with this quality. Fibers from Trivera CS is widely used by textile producers aiming to meet the requirements of flame retardant textiles used in public environments. Kvadrat is a big producer in this field. More research is needed to conclude on which textile to use. Preliminary suggestion is Ginger by Kvadrat available in a wide range of light colours. It has despite the synthetic fiber a appearance similar to natural fibers.

Since the shielding material is knitted, it is necessary have to use two layers of Trevira CS textile to laminate the construction together with the PE plates. The shielding can be done in two alternative ways:

Alternative A: One layer of shielding material (“Curtain” or stainless steel mesh) inside the laminate.

Pros: An elegant, integrated solution.
Cons: Need to solve the conductivity between walls and floor differently than suggested in model.

Alternative B: Small inner tent of shielding fabric which can be included or excluded.

Pros: Cheaper, more material efficient solution. Easier to separate the materials in the laminate when disposed. Possible to buy without shielding properties if this is not interesting.
Cons: Less interesting room experience? Puts a core idea in the project on the sideline

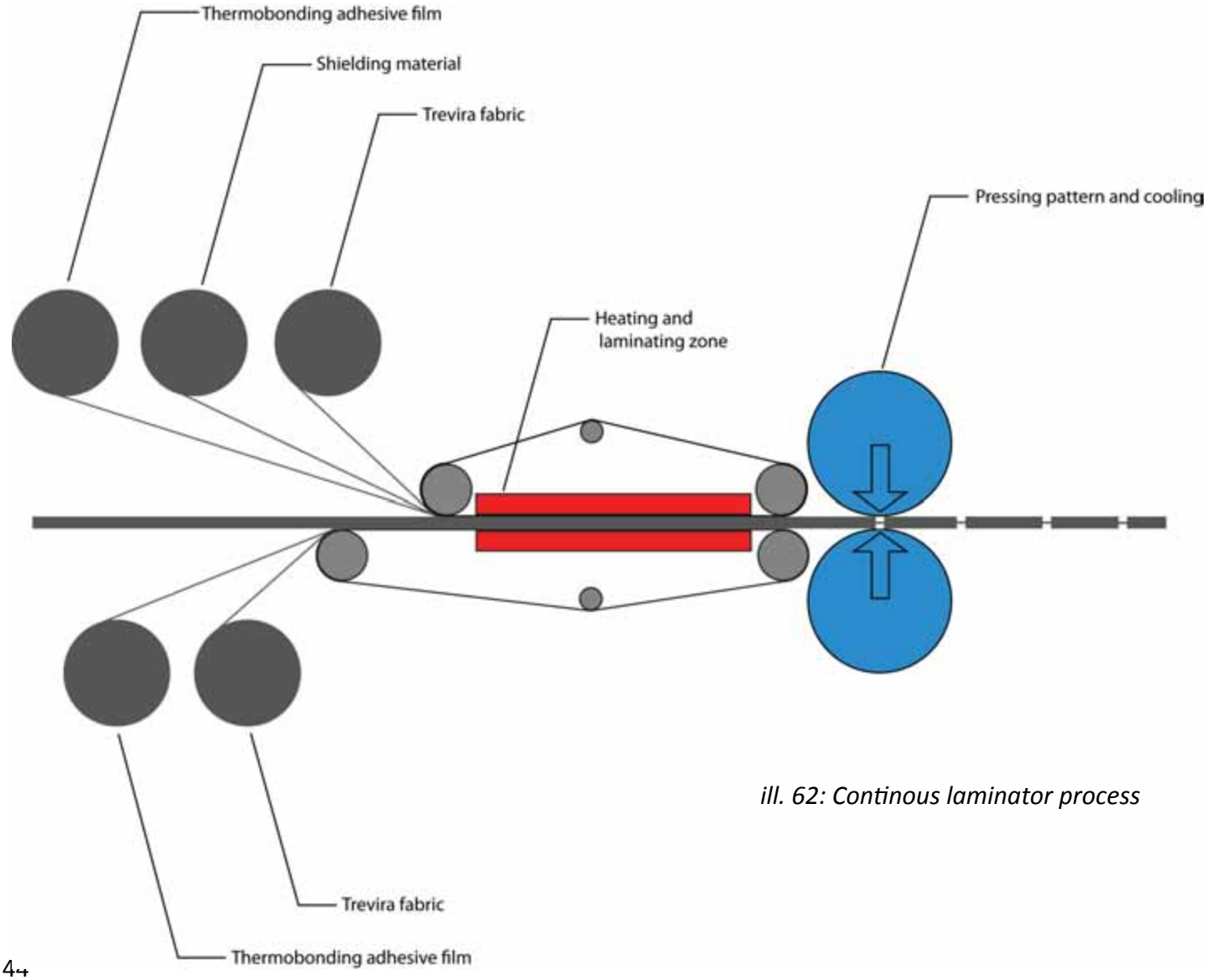
The use of two layers of Trivera will also give the structure a better spring effect. Conclusions on this alternatives must be made after further ivestigations on recycling possibilities.

The fabric Ginger can be washed at 60 degrees, Curtain at 30. The size of the product makes it impossible to wash in a machine, but stains can be removed by mild soap and water. In general PET (Trivera CS fibers) makes maintenance easy to keep clean because it does not absorb dirt.

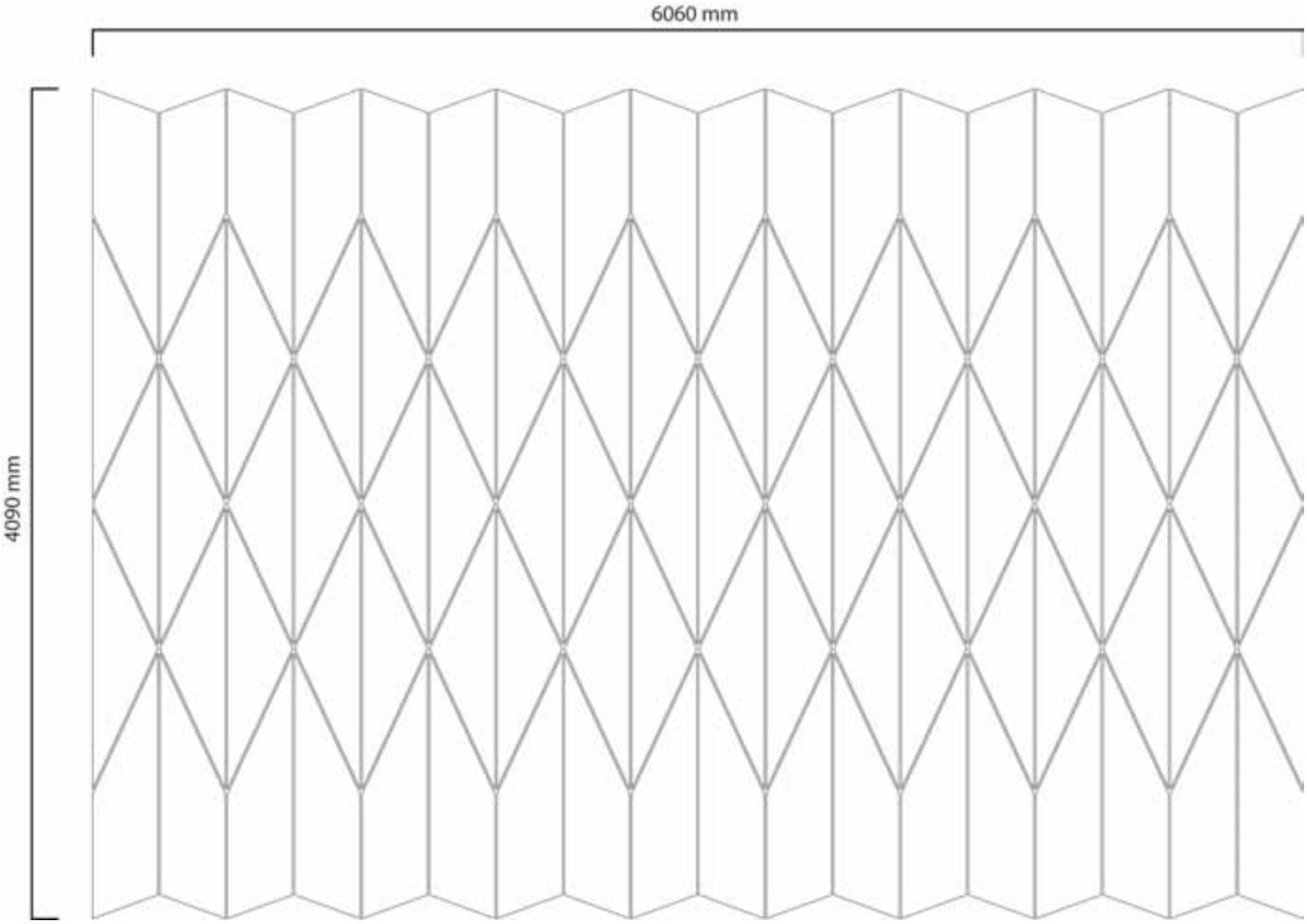
ill. 61: Material demonstration for showing the shielding performance. Internet access becomes limited, but sometimes possible depending on the strenght of the signals

4.7.2. Production process

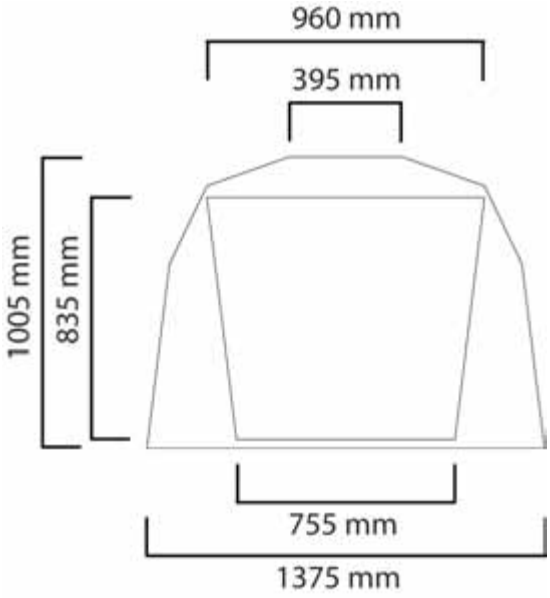
To make the production efficient and to ensure a repeated quality, it was a goal to find a production where one avoids cutting, aligning and placing each piece of foam (90 in total) separately. It was therefore decided to go for a thermoforming process. That means that the foam, the fabric and the adhesives need to be thermoplastic. When all these materials are thermoplastic it is possible melt specific areas flat and thin by applying pressure and heat. These compressed areas are later easier to bend and therefore work as the hinges in the construction. This is the same principal used in for instance the Cloud concept, which is made for Kvadrat by NMC in Sweden. According to correspondence with Einar Holmin designer at Norrøna, he is only familiar with smaller versions of such machines. They use this process for forming parts like upholstery backs in backpacks.
The normal way of thermoforming foamed materials like this is to heat up the materials in ovens and then press them in cold moulds. To use a process like this on these dimensions (approx. 5m x 6 m) would be very challenging.
To get answers on which methods were possible to use and how it could be done, contact with engineering competence was established through Terje Ulltang at Ekro Composites in Porsgrunn. Because of the challenges with thermoforming these dimensions, Terje Ulltang assessed a continuous process as a better alternative. There are several ways of doing this. Fusion machines, belt laminators, hot stamping are all relevant processes used in similar productions.
It was concluded that the product could probably have been made in several ways. On effective and easy method would be to custom design a laminator process and a machine for this project. One could then make a split so called flat bed laminator with two cold rolls compressing the groves in the foam and cooling it down after being heated up in the laminating zone. The principle would work more or less like showed in illustration 62.



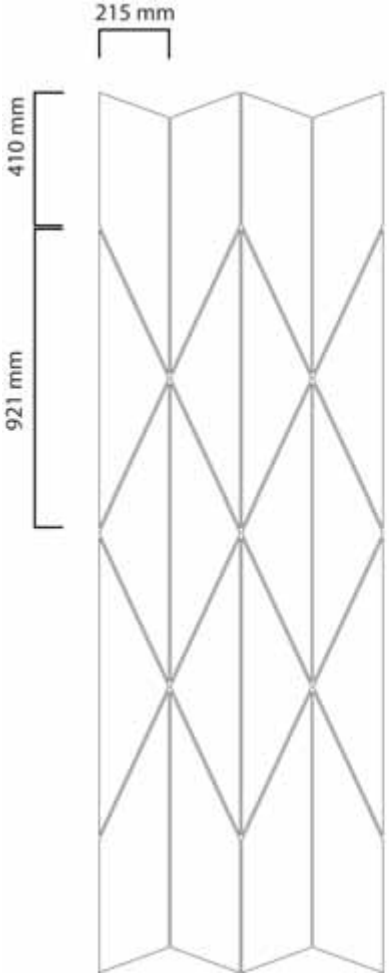
ill. 62: Continous laminator process



ill. 63: Measure drawing Wall structure when not folded



ill. 64: Measure drawing
Floor (one of two half sides)



ill. 65: Measure drawing
Singular cushions

4.7.1. Price estimate

The cheapest solution would be to find a producer with similar equipment that could be modified to handle a production like this. Due to the large format, this is assumed to be difficult. It is calculated that the purchace of the suggested production line represent a considerable investment in production equipment. Ekro Composites is investing in a more complex, but similar laminator these days with an expected expense of 5.5 mill. NOK. If this production investments was purchased, one could expect production costs approximately like this:

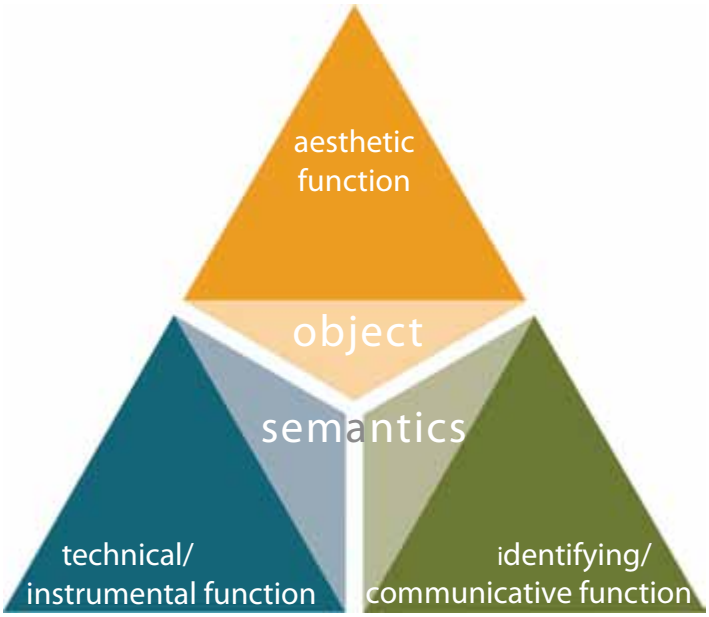
Expence	Price pr. sqare meter
Productioncost	100 kr
PE foam	83,50 kr
Textile (Ginger (Trivera CS) from Kvadrat) 2 layers	400 kr
Sheilding textile (Curtain from Ysheild) 1 layer	428,50 kr
Adhesive film	25 kr
Total:	1037 kr

Walls and floor equals 29 m3 + 0,2 % calulated loss 34,8 m3
34,8 x 1037 kr eqauls 36 087,60 kr + finishing 5000 kr pr. unit equals eqauls 41 087,60 kr pr. unit

4.8. Reflections

4.8.1. Intended user testing

To do user testing on the appeal of the room experience of the Igloo, it would be necessary to build the construction in full scale. Due to material costs this was not possible. The nature of the construction is not easily illudated in a mock up. For these reasons user testing where postponed to after the model building. The scheduled finishing of the product was delayed, and this resulted in no user tests being conducted within the work covered in this report. Such tests should bring the user perspective to the surface which can give important reflections in the further development. It was planed to explore potential users` room experience in accordance with the following model of semantic value (ill.66) This model is developed in earlier work (module PDMK 4300 Strategies in product communication)



ill. 66: Construction of meaning, semantic value of objects
Based on model by H. Oehlke, (Oehlke, 1989)

Questions which would be explored in such user test would be: Does the product represent semantic value to the user? For which reasons? For which reason not? Is it the instrumental function of the product; the shielding properties or the room divider function that gives the product value for the user? Aesthetic attraction or repulsion (the room experience, associations) or symbolic values (associations to a place, memory or situation or thoughts on self-image, representative value.)
The main goal of such analysis is to bring to the surface unexpected views related to the design of the product. It would answer concrete questions like: Is the room experienced as entering into another world? Is it to big? Which associations does it bring?

4.8.2. Reflection on the process

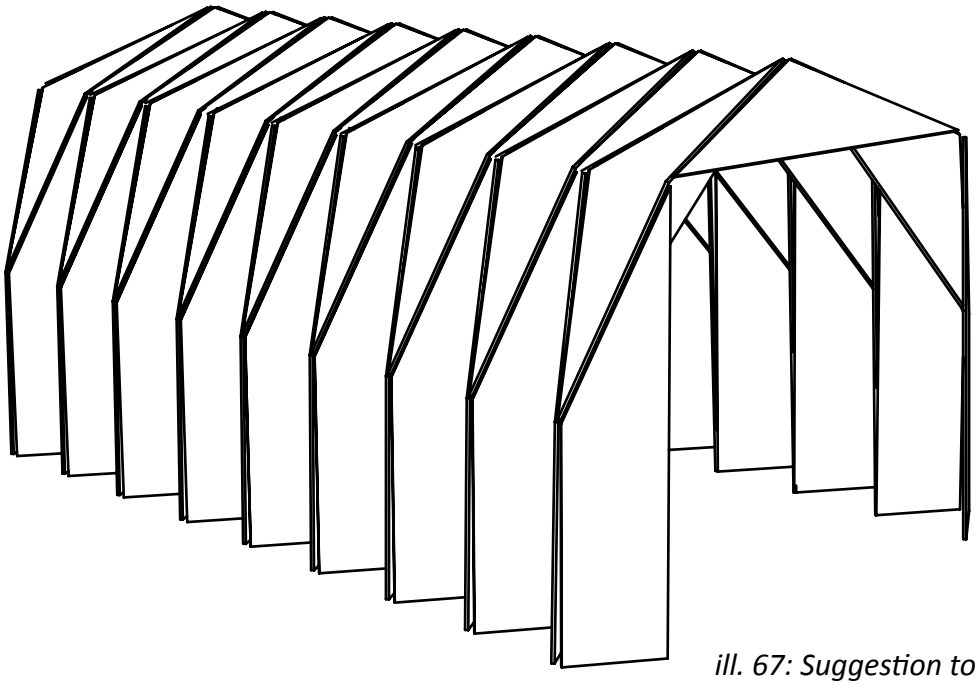
The process of this project was assessed as demanding, due to the complexity of the investigated area. It taps into such different subjects as social sciences and psychology and pure physics related to shielding possibilities and aims to unite this into a product concept. These were fields where the author did not possess explicit knowledge in advance. This made the work varied and interesting, but very challenging. In retrospect the work process probably would have been easier if the project was narrowed down. Perhaps to one specific user group, situation or one specific context like an institution or for a fictional client. This would have given clearer demands and it might have been possible to come further in the process of marketing work.
It is disappointing not to be able to present user analysis like described in last section. (4.8.1. Intended

user testing) This represents a weak point in the delivery. Such analysis would give indications on the relevance of the product in the marked.

4.8.3. Reflections on further development

The main area of further development is considered to be environmental concerns. Lamination of different materials is not the best way of constructing, since it has to be separated for recycling when disposed. The goal on further development is to find foam, adhesive and textile that are made from the same polymer and thus does not need to be separated. This should be possible as both polyethylene textiles and pet foams are available. These are materials under development and it requires more investigations. The shielding material however is a challenge because it has to be electrically conductive. It might be possible to fuse on layer of stainless steel mesh onto the laminate and easily tear it off for recycling. The goal is than that the bonding ends up weaker than the stainless steel mesh when torn off. If this does not work, using an inner tent of shielding material (like suggested in section 4.7.1.) must be used or other solutions investigated.

Based on the suggested construction principle and production process, it is possible to imagine developing other concepts. Shielding products for babies and small children are actual marked. Also products that can shield people during sleeping is a feasible further development. Such a product could be made from the same shape as the Igloo. When it is invested in production line, only paper folding and imagination restricts the limits of this way of constructing products.



ill. 67: Suggestion to further development: Tunnel tent to put over the bed?

It is considered that this concept is two sided: Firstly the product is a comment to a development in society. It is a comment to our responsibility as designers to enhance solutions with a critical perspective on what is actually good for people. Many has commented: “Can one not just turn of the phone, or the computer?” Yes, one could. It can be considered a paradox to present a product to a problem that can be solved by turning of the phone or go for a walk. For many this works. For others however, to stay available, to keep all opportunities at hand, becomes a life style. The convenience and privilege of constant availability, instant information access and overwhelming choices come at a cost. Igloo is not a final solution to these problems. Solutions will be required on many levels to meet the challenges of cognitive overload. Igloo is, by outlining an unplugged space, a reminder that unavailability is available. The work presented in this project only represents a scratch in the surface of a problems increasingly subject of research within social sciences and psychology. This part of the project is assessed as achieved in the sense that it addresses an essential and current development in society.

Secondly, as a product of this comment it, Igloo is a product idea made for the home marked. Trough analysis of distracting impulses it was clear that what the concept should emphasize on shielding for visual and audial impressions, and provide shelter from telecom signals. In the case of visual and audial impressions, it has to been done in a way that allows the person inside a sense of overview of the outside, but still a feeling of being in another world. When closed, the product limits visual input from the outside to changes in light conditions and shadows, and the experience of the room from the Igloo´s inside. Due to the foam materials inside the walls, sounds from the outside occur dim. The achieved shielding performance is not satisfactory to the extent that it unables availability under all conditions. But it is done to the extent that is feasible in a concept made for the home marked. The Igloo does physically outline a space which provide the possibility for unplugged moments in an occupied everyday life. If it encourages the user to unplugg from availability, stands unproven. The intention is, through creating an alternative atmosphere in the home, to serve as a reminder of the advantages of a personal space. Whether the need is to contemplate important events, focus on a demanding task or simply enjoy a peaceful rest.

ill. 68: Igloo

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Web-pages:

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Statens Strålevern (Norwegian Radiation Protection Authority) http://www.nrpa.no/
Post- og Teletilsynet (Norwegian Post and Telecommunications Authority) http://www.npt.no/
Helse og Omsorgs Departementet (Ministry of Healt and Care Service) http://www.regjeringen.no/nb/dep/hod/pressesenter/pressemeldinger/2009/tar-stralebekymring-pa-alvor.html?id=586498
Foreningen For El-overfølsomme http://www.felo.no/
Holland Shielding Systems http://www.faradaycages.com
Y-shield EMR-Protection *yshield.eu/*
Caparol Sverige AB http://www.caparol.se/desktopdefault.aspx?tabID=4431&lang=sv
meyer-machines.com/
reliant-machinery.com/

Illustrations

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Cantiz, H. (2009). Schwitters in Norway. Oslo: Henie Onstad Art Center.
ill. 7: Clouds by Ronan and Erwan Bouroullec: kvadratclouds.com
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ill. 14: Head and shoulder protection: rkt.se
ill. 15: Faraday-tent: faradaycages.com/index2.php?p=Content&id=134&nav=Faraday%20cages&nav_grp=EMI%20/%20RFI%20shielded%20tents
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interconnector.ie/media/emf.gif
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Appendix 1: Timeorganizing

	januar					februar					mars					april					mai				
Aktiviteter/Uke	1	2	3	4		5	6	7	8		9	10	11	12		13	14	15	16		17	18		19	20
Prosjektorganisering ferdig til prosjektstart																									
Litteraturstudie innhenting av relevant teori																									
Planlegging og gjennomføring av undersøkelser																									
Konseptutvikling/modellutprøving																									
Brukertester av konsepter																									
Dokumentasjon av prossess																									
Sluttmodell																									
Arbeid med rapport																									
Visualisering av valgt konsept																									
Arbeid med presentasjon																									
Milepælsmøter med konkrete delmålmål					1					2					3					4			5		

	Dato milepæl:	Involverte parter:	Beskrivelse av delmål:
Milepæl 1:	31.01. (21.01.)	Møte på skolen (Petter/Tore) 25.01	Frist oppgaveformulering 21.01., Ferdig oppsett på rapport/påbegynt skrivepros., Utkast til undersøkelser/Klar til å møte Svein Hovde
Milepæl 2:	28.02.2010	Egen milepæl	Velge konsept. Klar til å starte arbeidet med viderutvikling av valgt konsept/sluttmodell. Ferdig gj.føring/analyser av innledende runde undersøkelse.
Milepæl 3:	31.03.2010	Egen milepæl	Før påskeferie(torsd.1.- tirsd.5. april,uke 13/14):Ferdig med bruker undersøkelse av valgt produktkonsept.
Milepæl 4:	30.04.2010	Egen milepæl	Ferdigstillingsfase av modell, prosessdokumentasjon og rapport. Kartlegge/klargjøre prioriteringsplan
Milepæl 5:	12.05.2010	Innlevering	Innlevering av modell, prosessdokumentasjon og rapport. Endelig leveringsdato 14.05. (13.05. Kristi Himmelfartsdag)

Discription of activitys

Timeplaning
- Time scedule (Gant diagram) with milestones
- Discription of activitys

Research
- Litterature search/reading
- Planing and exetution of exploration of user needs
- Search for inspiration
- Search for information on radiation and materials

Product developement
- Ideageneration/sketching
- 3D modelling (CAD)
- 3D modelling (mock-ups)
- Sketching on technical solutions
- Visualization of final concept

Documentation work
- Notebook/sketchbook
- Collection and organizing of articles/inspiration/sketches/drawings/material crutial to the process
- Organizing of references

Illustration work
- Modells presenting the workprocess/research design
- Modells illustrating theories etc.
- Illustrations of process and concepts
- Illustrations of the concept in use
- Productiondrawings
- Presetation material for exhibition
- Presentation (for oral examination)

Textproduction
- Report
- Presentation material

Kartlegging av mulige kilder til distraksjon i arbeidsmiljøet

Dette er en undersøkelse som søker å kartlegge mulige kilder til distraksjon i arbeidsmiljøet. Undersøkelsen er anonym og vil benyttes som underlagsmateriale for produktutvikling.

* Required

1. Kjønn *

- ○ Mann
- ◉ Kvinne

2. Alder *

3. Hvilket alternativ beskriver best oppgavene du utfører i din nåværende arbeidssituasjon? *

- ○ Min arbeidssituasjon består hovedsaklig i oppgaver utført på datamaskin
- ○ Min arbeidssituasjon består tilnærmet like mye av oppgaver utført på datamaskin og oppgaver som ikke utføres på datamaskin
- ○ Min arbeidssituasjon består hovedsaklig av oppgaver som ikke utførtes på datamaskin

4. Hvordan er rommet/plassen du arbeider i/på? *

- ○ Eget arbeidsrom/plass
- ○ Deler arbeidsrom/plass med andre

5. Hvilke av følgende applikasjoner/portaler har du tilgang til når du arbeider på datamaskin? *

- ☐ Mail applikasjon
- ☐ Chatting applikasjon
- ☐ Video konferanse applikasjon
- ☐ Musikk applikasjon
- ☐ Full internett tilgang (inkludert sosiale medier)
- ☐ Begrenset internett tilgang
- ☐ Intranett
- ☐ Other:

6. Hva har du tilgang til/blir du utsatt for i de nære omgivelser til arbeidersplassen din? *

- ☐ Mulighet til å delta i samtaler
- ☐ Lyder fra folk som samtaler/arbeider
- ☐ Lyder fra maskiner, ventilasjonsanlegg, forbipasserende eller liknende
- ☐ Kaffemasin/tekoker/vanndispenser
- ☐ Café/kantine
- ☐ Tilrettelagte utearealer
- ☐ Mulighet til å handle
- ☐ Telefon
- ☐ Mobiltelefon
- ☐ Printet materiale; boker, aviser, magasiner
- ☐ Other:

7. Har du benyttet noen av punktene i spørsmål 5 og 6 i løpet av de siste to timene? *

- ○ Ja
- ○ Nei

Hvis "Ja" hvilke?

- ☐ Mail
- ☐ Catting
- ☐ Video konferanse
- ☐ Musikk
- ☐ Nettbrowsing
- ☐ Sosiale medier
- ☐ Intranett
- ☐ Telefon
- ☐ Mobiltelefon
- ☐ Printet materiale; boker, aviser, magasiner
- ☐ Drikke
- ☐ Mat
- ☐ Deltakelse i samtale
- ☐ Lyder fra folk som samtaler/arbeider
- ☐ Lyder fra maskiner, ventilasjonsanlegg, forbipasserende eller liknende
- ☐ Kaffemaskin/tekoker/vanndispenser
- ☐ Cafè/kantine
- ☐ Utearealer
- ☐ Handle
- ☐ Other:

Hvordan vil du karakterisere denne/disse avbrekket/ene fra arbeidet? Velg en eller flere alternativer

- ☐ Arbeidsrelatert
- ☐ Pauserelatert
- ☐ Distraksjon fra arbeidet

Evt. utfyllende kommentarer

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(The interview was given in Norwegian and is thereby redered in this language, the parts refered to in the report are translated from this text:)

Intervju med Svein Hovde 10.03.10.: Om ditt valg av å ikke ha mobiltelefon

Anne Kathrine: "Hvilke tanker ligger til grunn for at du ikke har mobiltelefon?"
Svein: "En del av grunnen består i et selvbilde som ganske rotete, distre. I praktiske gjøremål, for eksempel å lage en kniv, lurer jeg ofte på hvor jeg har lagt et verktøy, det jeg holdt på med... Dette gjelder også i andre gjøremål, ikke bare praktiske, f.eks. lesing. Tror jeg hadde lett mye etter telefonen. Så å ha mobiltelefon hadde vært å utsette seg for noe som gjør det vanskeligere å holde tråden. Jeg liker å fordype meg i ting. Det blir en måte å holde fatningen på, for å bruke en matafor: ikke "gå i oppløsning". "
Anne Kathrine: "Unngå fragmentering?"
Svein: "Ja - Videre er en grunn irritasjon over enerverende oppførsel i forbindelse med mobilbruk. En mangel på tilstedeværelse, fraværenhet. For eksempel ser jeg barn på toget som ikke får oppmerksomhet av forelder som snakker i telefon. Men det er jo mange måter å bruke telefon på. Si at 90 % av den norske befolkningen har mobiltelefon - det vil tilsi forskjellig bruk. For eksempel har jeg en venn som bare setter mobilen på når han skal på hytta. Helseaspekter er også en grunn. Og identitet: anser meg selv som en litt gammeldags mann. Kan bli irritert over alt som regnes som "nytt og fint". Har interesse for spikking og knivmaking. Men det går jo også på hva jeg anser som dyder, gode egenskaper: en litt langsommere tilnærming, færre ting på en gang, konsentrasjon, engasjement - fasinasjon for dybde innen et smalt felt. Jeg anser det som et kompliment å bli kalt gammeldags. Og det opplever jeg også å få aksept for. Det blir en måte å dokumentere mangfold, som utstillingen med forskjellige typer kleshengere." (Svein har sammen med Arne Eide stilt ut en samling av over 3000 forskjellige kleshengere) "Det blir min måte å bidra med variasjon på. Men det er negativt hvis dette bare blir en trass reaksjon. Det kan være vanskelig å vurdere hvor grensen går mellom faktiske grunner til å ikke ha mobiltelefon og trass i forhold til å være konsekvent i forhold til et standpunkt."

Anne Kathrine: "Hvilke fordeler synes du dette valget medfører? ... Vi har vel allerede vært inne på dette allerede -"
Svein: "Helt konkret så kan jeg jo ikke miste den, legge den igjen. Det tror jeg hadde gjort ofte. Har vanskelig for å huske småting som skjerf, hansker, paraply osv. Helsemessig utsettes jeg ikke for risikoen knyttet til mobilbruk, men dette er ikke et hovedpunkt."

Anne Kathrine: "Hvilke ulemper?"
Svein: "Hovedproblemet er å påføre seg dårlig samvittighet i sosial/samfunnsmessig sammenheng. Ting er tilrettelagt for at at man skal ha mobiltelefon. For eksempel når jeg ankommer Vikersund med tog står det som regel ikke taxi på stasjonen. Man må ringe, da må jeg bruke myntapparat som sluker penger mens man trykker seg gjennom menyer. Legen min har ordning med å sende forespørsel om time via SMS. Hvis man skal ringe med fastelefon må man trykke seg gjennom menyer for å få snakke med legesekretæren. Dette blir stadig vanskeligere. Man blir avhengig av å gjøre avtaler, og disse kan ikke enkelt justeres. Følelse av å snylte på venner for å gi en viktig beskjed er også et problem."

Anne Kathrine: "Er planen å fortsette å ikke å ikke ha mobil?"
Svein: "Ja så lenge det går."

Anne Kathrine: "Hva synes de som oftest ønsker å få tak i deg om at du ikke alltid er tilgjengelig?"
Svein: "De liker det dårlig. Aksepten synker. Hvis jeg må gå til anskaffelse av mobiltelefon blir dette motvillig. De har vel en oppfating av at "han er sånn". Jeg får kommentarer som det ligger kritikk i, for eksempel: "Du er så ekstremt vanskelig (eller umulig) å få tak i!" Eller: "Nå vet jeg ikke hvor mange ganger jeg har prøvd å få tak i deg!" I historisk perspektiv har det blitt en forpliktelse å være tilgjengelig. I første fase da mobiltelfonen nettopp hadde kommet ble det ansett som sært at folk satt på bussen å snakket i mobiltelefon. I neste fase ble dette normalisert og så ble etablert som forventet - hvis man ikke har mobiltelefon må man forvente å svare på hva som er grunnen. I dag er det i mange sammenhenger en

offentlig erkært forpliktelse, for eksempel å lese mail når man er på ferie. En ansatt i et interiørarkitekt firma motsatte seg dette kravet og ble oppsagt på dette grunnlaget."

Anne Kathrine: "Jeg antar du også får mye reaksjoner fra folk som du ikke møter så ofte. Hvilke reaksjoner får du?"
Svein: "Mange reagerer med forundring, noen med interesse, noen forteller om andre de kjenner til som ikke har mobiltelefon, fører noen ganger til morsomme samtaler. Opplever jo noen ganger at det fører til at folk tenker gjennom hvordan vi lever. Det syns jeg det er positivt å bidra til."

Anne Kathrine: "Du har uttalt at det «holder hardt» å ikke gå til anskaffelse av telefon. På hvilke måter opplever du press?"
Svein: "For eksempel på hyttetur, når man vil bestille drosje, hvis man ønsker å tilpasse en avtaler, å møtes eller komme bort fra hverandre på store arrangementer - idrettsarrangementer for eksepel. Jeg skulle en gang på en muntlig eksamen - en ganske viktig sammenheng - og innså underveis at jeg ble forsinket pga. toget. Man vil gjerne gi beskjed. Det blir et nederlag å spørre om å få låne en mobiltelefon for å få sagt i fra. Blir et spørsmål om hvor vanskelig jeg skal gjøre det for meg selv for å hold på et prinsipp. Det å kalle det et prinsipp er jo interessant - det er jo noe jeg anser som naturlig. Det å ikke ha mobiltelefon er radikalt sammenliknet med å ikke ha bil og lappen, som jeg heller ikke har. Så det er dårlig samvittighet som utgjør størst press"

Anne Kathrine: "Hvilke faglige refleksjoner gjør du deg om fenomenet mobiltelefoni og tilgjengelighet? I samfunnstukturelt perspektiv og på individuelt plan?"
Svein: "Det forandrer måten vi omgåes på, samværsformer og måten vi tenker på. Det lager nye mennesker, også genetisk - uten at jeg kan gjøre rede for dette. Man lærer nye ferdigheter; for eksempel kombinere grovmotorikk og finmotorikk som når man går på glatt is og skriver melding, dramatisk forbedring i omgang med/forståelse for tastaturer, konsentrasjon, evne til å gjøre flere ting samtidig. Sammen med annen teknologi tror jeg det fører til et økt ønske om å kontrollere, overvåke. Tror det skal mye mindre til i dag før det settes igang leteaksjoner enn tidligere. Man har meldeplikt. Både på individuelt plan og sammen endres måten vi omgir oss med tingene på. Det finnes en bok som omhandler endringene i det sosiale samspillet som inntraff i Stockholm i tiden etter at telefonen (fasttelefonen) gjorde sin inntreden hjemmet mot slutten av 1800 tallet. Jeg er fasinert av virkningen av slike samfunnsendringer. Slik sett utgjør jo utbredelsen av mobiltelefonen et kjærkomment eksempel. Jeg har freidig lyttet etter hva folk snakker om i mobiltelefon i det offentlige rom og notert ned. En person satt på et tog og ringte og sa opp en ansatt. Vitner om mangel på bluferdighet, forsiktighet i forhold til hva man snakker om i det private rom. Skillet mellom det Hoffman referer til som "frontstage" og "backstage" hviskes ut. Graden av forsiktighet i forhold til å si "vi ringes senere", hvilke temaer som omtales i det offentlige rom, strekkes. Tror også dette har sammenheng med alder."

Anne Kathrine: "Har du, eller kommer du til, å skrive om dette "sosiale eksperimentet" i faglig sammenheng?"
Svein: "Jeg bruker det i forelesninger og undervisning. Men som vi snakket om, blir det vanskelig fra eget standpunkt å vurdere for eksempel hva som er trassighet i forhold til om å stå ved en beslutning."