nectar
THESIS
PROJECT

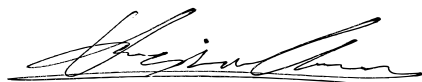# TITLE PAGE

Asterios Chantes

Synopsis

This project concerns the development of an inflatable workstation for public spaces. The product is designed in consideration of people who are using the parks as a place to "work" with their laptops.

The first phase, the Research, deals with basic aspects of the project, such as the definition of the target group, an analysis of the open public spaces, a morphological analysis of the workstations. In order to have more available data for the project, a central park of the municipality of Aalborg is being used as a case study. The first chapter ends with the problem statement.

The second phase, concept development, concerns the problems that a person deals with in a park when using a laptop, the demands and specifications of the users, coming out of interviews and observation. In addition, the values and the vision of the new product are defined and the final concept is selected.

The third phase, product development, introduces the more technical aspects of the project and ends with the final product.

PREFACE

Reading guidance

The thesis is documented in two reports: A process report and product report. The process report contains four phases. Phase 1, 2, 3 and 4 dealing with the research, development and realization of the project.

The product report is a detailed presentation of the product that has been designed.

Harvard style is used for referring to various sources. The list of references and illustrations can be found in the back of the process report. When referring to appendix, illustrations, diagrammes and pictures, the following format will be used.

ill. 1.2.3

Phase — Chapter — Illustration
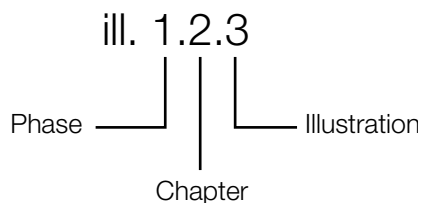
The appendix and the report can be found in the CD on the back of the process report. The CD also contains pictures, sketches and diagrams that have been collected during the design process.

Acknowledgements

This project involves the development of a concept work station for Aalborg's public park, Kildeparken. In this context I would personal like to thank some people who have assisted with information, feedback, critical comments or even help whenever was needed.

For information, support and input: Aalborg municipality and especially the people from the maintance department of the municipality.

I would also like to thank Mr. Henrik Harder, proffesor of the A&D in Aalborg university and his team, for their contribution through the GPS reseach on Kildeparken.

Also, my supervisor Nicola Morelli for the effective cooperation from the beggining until the end of the project.

TABLE OF CONTENTS

INTRODUCTION
A brief introduction to the project

This project is the result of the master thesis. The main theme that the project deals with is open public spaces and more specific the design of an inflatable workstation for parks.

The purpose of this report is to reflect upon the personal ability of the writer to organize and run a wide project, based on the experience of the previous semesters and the general education.

In that context, the attempt was to present a complete research for one concept and not dive into only one point of view of the project.

That means that during the project there was an effort to keep a balance between the theoretical part, introducing the back office and the front office of the project, design the offered service and link the actors of the new system, while at the same time, explore the industrial aspects of the project, such as the form, the construction, the manufacturing techniques and more.
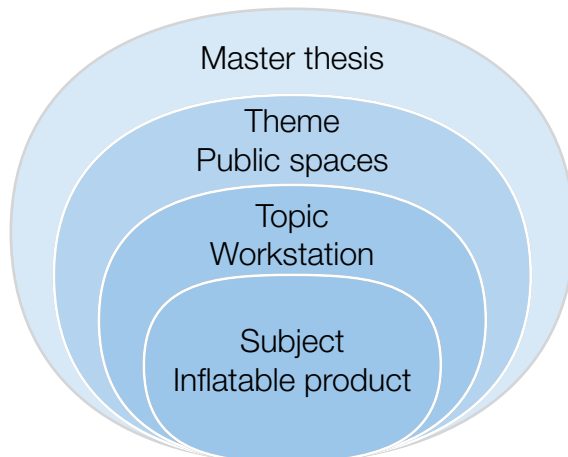
ill. 0.1.1 Project frame

PROJECT ORGANISATION
The project organisation in an explanatory diagram

The process is illustrated in the funnel diagram describing the diverging and convergent process of the project.

Primarily, a wide planning in order to set the framework of the project is done. Soon, the focus is gathered in one aspect, which is chosen as a topic for the project and a wide research is carried out in order to approach the theme better.
The research phase is not ending at a specific point, but the outcome of the initial research gives the spark for the concept development.
Once the concept has achieve a complete level, the development of the product starts. The end point of the process is the final form of the product.

Although the design of the service behind the product is essential part of the process and runs almost parallel with the development of the product, it is not included in the diagram since it is not part of this report. The design of the service can be found in the product report.

Planning	Phase 0
Research	Phase 1
Concept development	Phase 2
Product development	Phase 3
Outcome	Phase 4
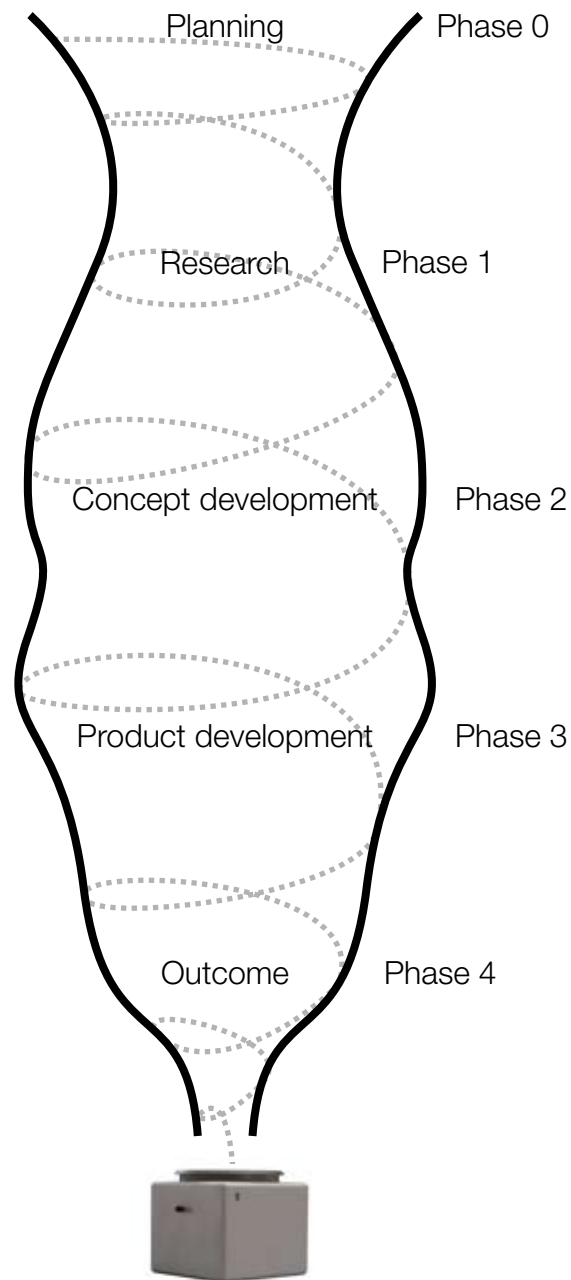
ill. 0.1.2 Project organisation

In the first phase the main objective is to identify and document the design task. That happens with an investigation in public spaces and workstations.

Another aspect of the phase is to understand and define the target group. This is carried out by observation and interviews in order to identify their needs. Personas are formed to be used later on in use cases.

A case study about a public park, that is gone be used during the project is presented. The research results are summed up and used as a basis for the problem statement.

OPEN PUBLIC SPACES

To initiate the project a research of the term
open public spaces is performed

Public Space

According to wikipedia, a public space refers to an area or place that is open and accessible to all citizens, regardless of gender, race, ethnicity, age or socio-economic level. No fees or paid tickets are required for entry, nor are the entrants discriminated based on background.

As public spaces can be mostly described the streets, town squares or parks and some of the goverment buildings such as public libraries.

This project will mainly focus on open public spaces and more specific to public parks.

Anybody has the rigth to act as he wants in a public park as long as he is not violate the freedom of the others. That means that the park can be used for a lot and different purposes. Some of the most common uses are:

- Leisure / relax
- Barbecue
- Socialize
- Meeting point
- Sports (Running - Soccer)
- Entertainment

Elements

Besides the geographical characteristics of a landscape, hills, lakes, trees, paths, etc., in a park can be also found some standard elements that are used for the physical and psychological needs of the public, such as statues and memorials, art pieces, fountains, benches, night lights, garbage beens and more. The variety and the number of the extra elements, depends on the size, the use and the position of the park in the city.

Daylight

| | | | | | | | | | | | | Time of Day |

Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec

Winter   Spring   Summer   Autumn
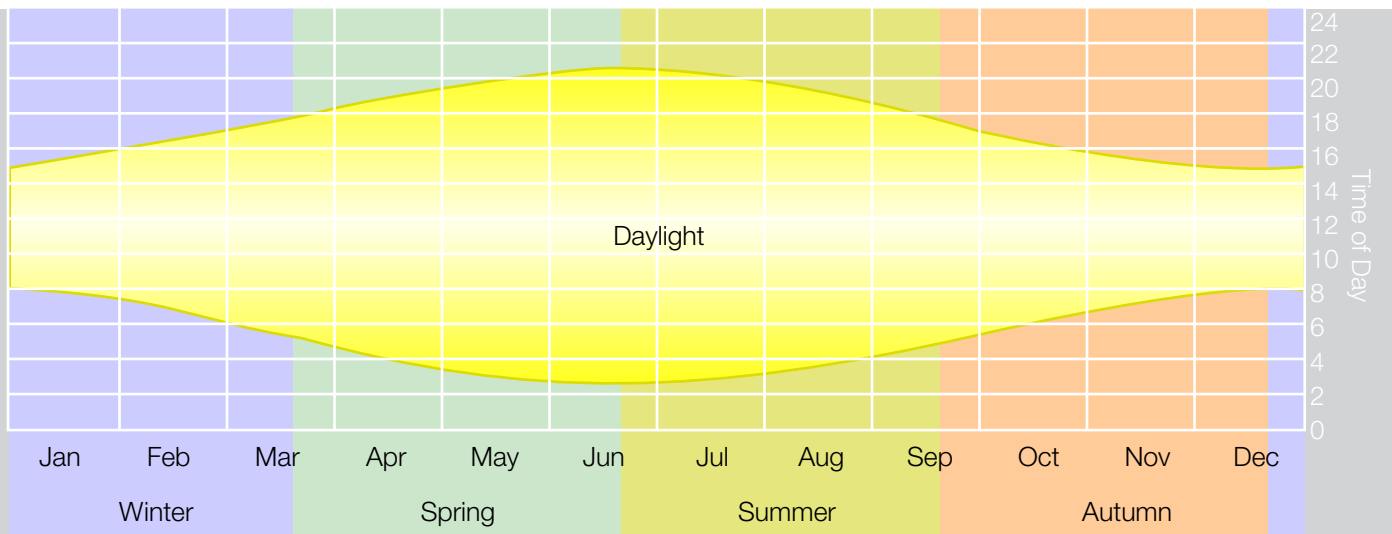
ill. 1.1.1 Daylight

Use of the park

Usually the public parks are open 24 hours per day all year long. But the use of them from the crowd is changing according to the temprature and the daily light during the year.

In the diagramme above, it can be seen the daylight in the area of Aalborg. The light lasts from 7 hours in the winter time up to almost 19 hours in the summer time.

Since the temprature is also suitable for staying outside, the parks of Aalborg are crowded and alive at summer time.

WORKSTATIONS

The objectives of this chapter is to give a brief understanding of what a work station is

a.

b.

Worksations

A workstation in a manufacturing environment, is an area with equipment for the performance of a specialized task usually by a single individual.

A simple desk and a chair, where somebody can have a piece of paper and a pen, can be consider as a workstation. The workstations have been developed a lot since the period with the desk and the paper. Today, a computer unit and internet are essential parts of a working environment.

A workstation can either be bought as a complete furniture with all the extra features included or it can be built element by element by the user.
A major classification of working spaces refers to open and closed environemts, or in other words, to team workstations, where the communication and interaction between the members is essential part of the design of the space or individual workstations, where isolation from the rest of the surroundings is more important. In this project, the focus is on individual spaces but without the restrictions of isolation.

Offices

The tenancy for the modern companies is to provide to their employes pre - designed workstations, that are

well ergonomically designed in order to achieve maximum productivity from them. Although this spaces are standard, still give the chance to the user to make small adjustments and customize parts of the space since the feeling of belonging in the working environment is really important (my office).

Future

The tenancy of the deisgn field for workstations is focused in three main cores: the ergonomy provided to the user, isolation from the surroundings and hichtech technology. Since the meaning of the workstation and working environemnt is change drastically according to the technology provided, it is hard to assume how the design of it will look like in some years from now or even describe the parts that a station will consists of.

c.

d.

e.

ill. 1.2.1 Workstations

MORPHOLOGICAL ANALYSIS

The chapter provides the basic information

about the components of a workstation

In order to investigate which are the major components that a workstation usually consist of, the method of morfological analysis is used. The products of the pictures from the chapter "workstations" are used as a reference.

During the process of the project, based on that analysis, different desicions upon the components of the final product are taken in order to form the product architecture.

Basic Components	Desk	No desk	Fixed	Moveable	Collapsible
	Chair	No chair	Fixed	Moveable	
	Working light	No light	external	Flat	
	Shelter	No shelter	Closed	Convertible	
Extra	Power Supply	Electric	Solar	Hybrid	Batteries
	Internet	No internet	Wirless	Wired	
Hardware	Screen	No screen	CRT	Flat	Touch screen
	PC Unit	Without	Fixed	Moveable	
	Mouse / Keyboard	Without	Fixed	Desktop	
	Microphone / Loudspeakers	Without	Fixed	Desktop	
	Camera	No camera	Fixed	Desktop	Rotational
	Printer	Without	Fixed	Desktop	

PROBLEM AREA

This chapter frames the problem area that is gone be further investigated during the project

a.

Starting from the analysis of the workstations and the research about the public spaces, various topics have been examined. The major point of this investigation was to make clear if a public park is used and can be characterized as a working environement and how the existing facilities satisfy the user's needs.

Interviews

Interviews with people "working" in a park were carried out. The main aspect was to identify the main target group, how much time does somebody spends on a park with his laptop, what are the main problems that somebody deals in a public park and other essential questions for the problem area.

Using the outcome of the interviews, it is found that people have specific needs relating to public spaces. It has become also clear that many of the problems concerning workstations are related to the use and the influence of the surroundings.
The problem area therefore covers an investigation of a workstation in a public park.

The outcome of the interviews has been also used later on in the project for documenting the demands of the target group and the specifications of the product.

Working in a park

The phrase "working in a park", might sound contradictory. That is because people during the years, have connect in their minds, public parks with leisure and relaxing time and not so much with work.
The truth is that with the new time perspectives and the available technology, more people in their free time, try to avoid the closed spaces and have some breaks outside in the nature.

During the project, the phrase "work in a park" refers to all kind of tasks performed with a laptop. Those tasks varies from internet browsing and music downloading to professional presentation and pie charts, according to the user.

Hot spots

In the majority of the european cities free wireless internet, known as hot spots, is provided to public spaces such as central squares. According to the danish legislation, it is not allowed to the municipalities to provide free wireless internet to public spaces since undercuts the private business. Based on that limitation, the project investigates sollutions to provide to the citizens the freedom of working with their laptops to a park.

b.

c.

d.

e.

ill. 1.4.1 Workstations

EXISTING PRODUCTS

This chapter presents products used as workstations in open spaces

a.

Although the indoor workstations have been under the focus of the designers and the furniture industry for many years, where has been achieved great progress on the ergonomy, efficiency but also in the philosophy behind the working environement, the situation with the outdoor workstations has remain almost static. The last years, mainly becuase of the progress in the field of technology, some new products for outdoor use, came out in the market.

Wireless Technology

The internet wireless technology, gave the ability to use network wherever you want. In that context, a lot of manufacturers gave attention on the shape and the characteristics of their products, in their attemp to make public furniture more appealing to the crowd.

Solar Energy

In the attempt to solve the main problem when working outside, the laptop's battery life time, a lot of products focus on how to collect solar energy.
Providing the basic components, a surface for the laptop and a sit, they vary from really light and simple constructions (pic. 3.4) to more complete providing a shelter and semi closed spaces (pic. 3.3).
These sollutions are consider rather

expensive than efficient. In addition, solar cells are avoided in crowded public areas for reasons of vandalism. Although, since the technology concern the solar energy becomes more available to the market it is expected that in the near future the cost but also the specifications of these products will be more suitable for that kind of use.

Weather Protection

A big category of outdoor furniture has focus on how to protect the user from uncomfortable weather conditions. Problems of the screen's brightness because of the sun or unpleasant wind were aspects that tryed to be solved by making clossed spaces for public parks.

b.

c.

d.

ill. 1.5.1 Existing products

e.

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TARGET GROUP

By looking at the initial analysis and the outcome of the interviews, the characteristics of the target group are defined

Althought the public parks by definition are used from everybody, the people who use the parks in order to work with their laptop have some precise characteristics. In order to approach the span of the target group, observation in public parks and some initial interviews were carried out.

Interviews

In that phase the interviews intend more to get an understanding of the people using the parks as "working environment" and not to get a feedback about their needs or comments about the project. In that context the interviews are limited to their age, questions about the equipment they usually use at the parks, technological equipment that would also like to use, the duration of their stay in the park and the reason of visiting.

Target group

The definition of the target group for the specific project it can not be very explicit from the early beginning until the whole life time of the product. That is because the variable of technology, which is a major aspect in the project, according to the age of the users, is changing gradually by the time. Few years ago, technology (computers and gadgets) consider as a privilege of young people since it was easier for them to adapt the new way of interaction. Today, more and more people of older age are becoming familiar with the field.

Based on that fact, the target group is defined through two main parameters. Age and level of technology knowledge. Where as a beginner described a user that can only use simple devices like radio and gradually goes to the advanced user who is an expert user of all kinds. In between can be found, the use of a mobile phone, ipods, laptops and more.

Age

| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80+ |

Level of technology use

Beginner   Advanced

ill. 1.6.1 Target goup   ill. 1.6.2 Target goup photos

18

PERSONAS

Three different characters are generetad to illustrate the span of the target group.

Anders Pedersen
Age: 32
Job: Economist
Civil status: Single

Anders lives alone in an apartment in the city. He works in a bank and spents a lot of time on the internet in order to keep updated for his work.

He runs a personal blog in the web about stocks markets and enjoys posting advice for readers of his page.

He is not fun of social gatherings but he enjoys spending time in the park while reading financial newspapers.

Birthe Jacobsen
Age: 29
Job: Assistant in a print office
Civil status: Married

Birthe lives with her husband and their three year's old daughter in a small apartment in the center of the city. She has a part time job in a print office.

She is an amateur novel writer and she would like one day to publish her stories.

In her spare time, she likes to take her daughter for a walk in the park.

Capser Gerhar
Age: 17
Job: Highschool student
Civil status: Single

Casper lives with his parents in the center of Aalborg. His income is generally coming from the danish government support (SU). He wants to wants to study computer science.

He loves his new iphone and spends a lot of time on facebook and net games with his e-friends.

He usually meet with his friends in the park to share music for his ipod and chat.
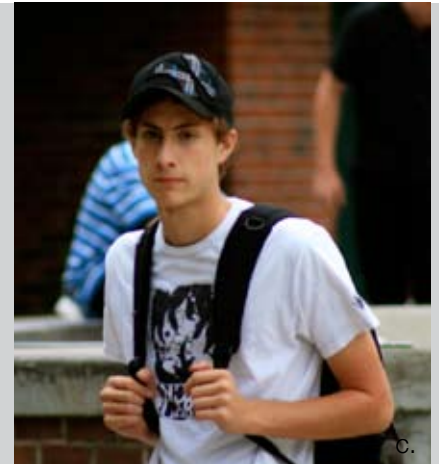
ill. 1.7.1 Personas

Personas
A method of understanding the target group by using fictive characters. Personas are used during the design process in different scenarios within a realistic context. In that way, abstract user data take personal characteristics which related to the design work, evaluating each time according to a "real" person's point of view.

CASE STUDY KILDEPARKEN

This chapter is a brief introduction of the park that has been chosen to work with as a case study for the project

In order to be able to investigate direct the problem area and have more input for the project, a specific park of the city of Aalborg has been chosen as a case study. The characteristics of the park as well the users are presented here.

Location

Kildeparken is located in the center of the city, bounded by main streets and the railways. Connected direct with the train station through a tunnel, makes the location of the park quite popular not only for the locals but also for people outside the city of Aalborg. The illustration on the right is diagram of the park.

Visitors

The park is estimated to have 1.1 million visitors anually. Depending on the weather, in a normal day of summer time, the park has more than 3000 visitors per day. During the winter time this ammount of people is reduced but still remains in a high number since the park is used as a shortcut.

Users

The majority of the people are using the park for recreation. Barbecue, is one of the common uses of the park for Sundays and free days. Kildeparken is also very popular for young people. It is usually used for meeting point after school and there are several events like the celebration of the first day of the school year.

Events

During the year there are several events in the park. Concerts and different kind of shows are held in there with bigger event the carnival of the city.

a.

b.

c.

d.

e.

ill. 1.8.1 Target goup photos
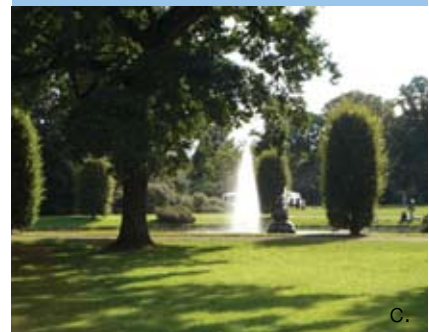
ill. 1.8.2 Kildeparken map

GPS ANALYSIS

This chapter introduces the user research of
a team for Kildeparken

This research is the outcome of a cooperation between Aalborg Municipality and the research team of Aalborg Uniersity, DMB (Det Mangfoldige Byrum). The results and the diagrams of the study, can be found in the appendix.

The study

The study took place in four parks in the area of Aalborg. Here are presented the results for Kildeparken.

The study that carried out, is divided in of two main parts, a GPS analysis and a survey of the users. The visitors of Kildeparken in the investigation were given a GPS unit when enter the park and were encouraged to wear the device until their exit, where they were asked to complete a questionnaire.

The aim of the research was to provide an overview of the users and give a perception of the park. The aim of the GPS track was to provide an overview of the parts of the park-that users used most and to identify the period of staying in the park.

The results

The purpose of visiting the park are scored as following: "Get fresh air", "Experience nature", "Peace and quiet", "be in a better mood" and "improve my condition". The five objectives of stay in the park are characterized as one - person activities and less as group activities.

The duration of stay in the park is described in the GPS map on the right.

Another interesting part of the survey was the rank of the importance of the various elements in the park, where tables and benches are coming while barbecue areas and playgrounds are ranked as less importants.

Since people are not used to public furniture for working with a laptop it is understantable that non of the answers refer to something familiar with the subject.

The results of this study are used during the project more as information around the field and less as guidelines for the new concept. Although the diagrams and figures are taking into consideration, it is not used as specifications for the product.

ill. 1.9.1 GPS unit

The GPS map, shows in which parts
of the park the visitors spent most of
their time. This is the relative alloca-
tion of time.
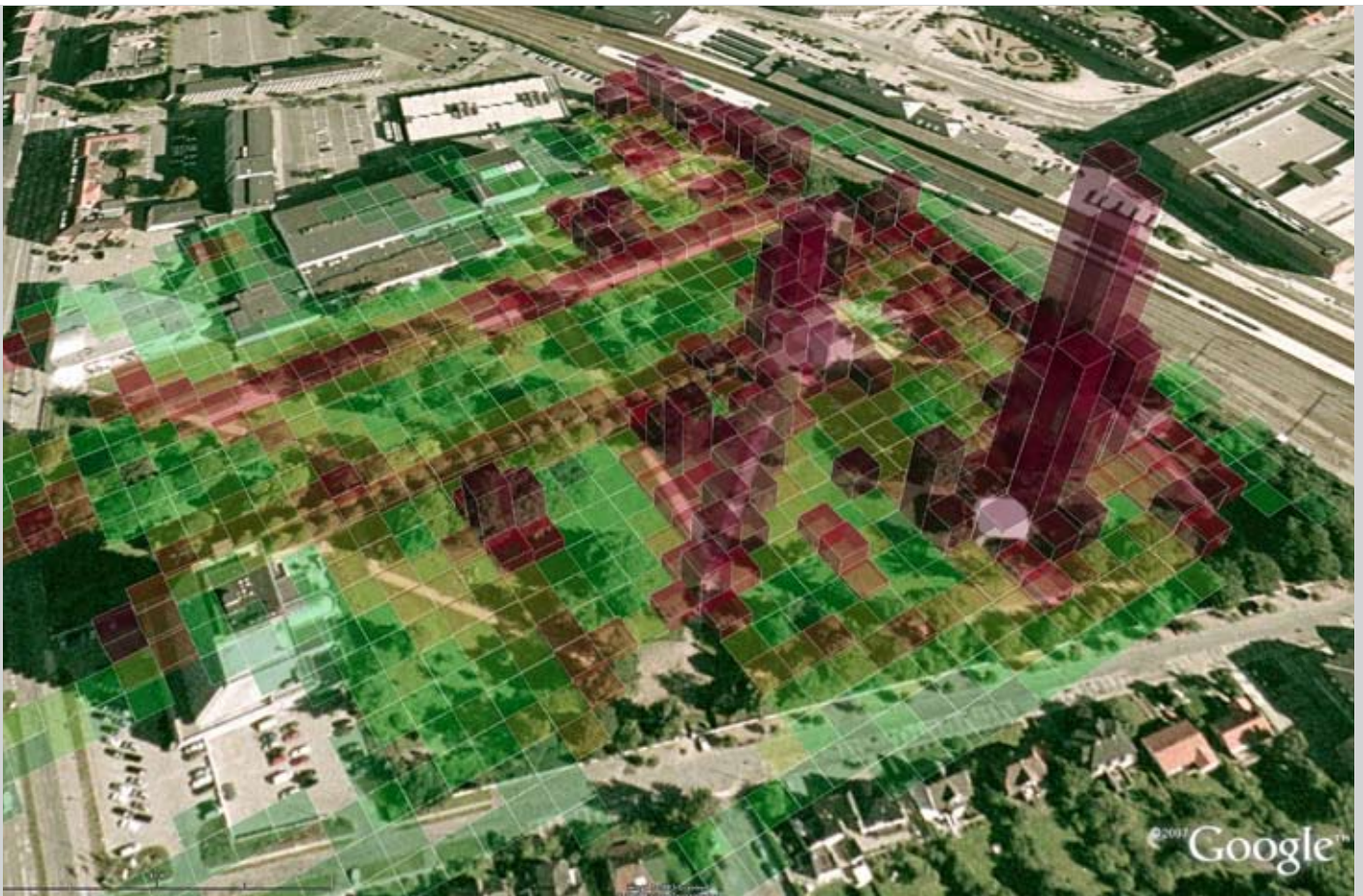
ill. 1.9.1 GPS analysis

CHOISE OF SUBJECT

The chapter sum up the perspectives of the project and gives a brief description of the product that is to be designed

Approach

The approach to the concept is to create an alternative way of using the park. Inspiration to the project is taken from people sitting in the grass of the parks with a laptop in their hands.

The concept

The concept relies on the need for an attractive and efficient way to work in a park. The concept is to design a workstation that it will be used in open public spaces and more specific, the project will be positioned in a main case study for Aalborg's central park, Kildeparken.

The focus is to give to the user the abilility and the freedom to use danish public parks as a working environment. This will include aspects such as power supply to charge your laptop, provide internet connection and an additional sitting to work on, where the design of the product will take in consideration the characteristics and the surroundings of a park.

Various problems when working in a park were found, such as power supply and internet. The following problem is stated for the project:

How to develop a workstation that will improve the conditions of people who want to work in a park with their laptops

By stating the problem, a more specific research about the problems in public parks is performed. Results from the interviews are used to define the demands of the target group. Furthermore, the phase includes an investigation on the ergonomic aspects of a park.

An idea generation is carried out and through evaluation, two main concept proposals are further developed and explored through rough sketches.

The specifications of the product are defined and a final concept for the project is specified.

PHASE TWO

CONCEPT DEVELOPMENT

PROBLEMS IN PUBLIC SPACES

The chapter presents some of the basic problems that somebody deals in a park

After stating the problem, working with public spaces, the different problems that somebody might deals with in a park, are highlighted.

Power supply

Main problem when working with a laptop in a park, is that the battery sooner or later is running out.

No Internet

Although the percentage of public squares with free wireless internet is increased rapidly, the situation in the parks remain the same, with no direct access. That is because according to danish legislation, non of the municipalities is allowed to provide free internet since it comes against the private business. Although private internet providers could offer internet legally in the parks, nothing like that exists until today since the way to charge the user is not easy.

Noise

Chlildren, dogs and loud people are some of the distracting and unpleasant noises. No silence regulations in the parks.

Sun / Wind / Rain

No shelter for protection against the weather is provided. The sun usually affects the quality of the light in the screen of the laptops, while wind and rain make the stay in the park unpleasant.

Uncomfotable sitting

The common benches in the parks are especially designed to offer short time sitting since the comfortability of them is limited.

When a person decides to go and work in a park, is usually aware of the conditions described. Most of the problems is usually possible to avoid or choose not to deal with (in case of bad whether conditions, you stay home), but in the first two cases, power supply and no internet, is aspects that you are aware of but you can not react since there is no appropriate infrastructure.

ill. 2.1.1 Problems in parks

ERGONOMY IN THE PARK

In order to get a basic understanding of the ergonomy in the park, a test - research was arranged

The approach to the concept development is to create an understanding of how people interact with the park. A way to achieve that, was to take several photos of a person using a laptop in different possible sitting positions in a park. The positions were spontaneous in the majority and the duration of each of them was based on the comfort of the user.

The second step, was to evaluate the pictures and grade them according to time and the comfortability of usage. The positions where also highlighted with comments concern the sourounding elements, like benches, trees, wet grass etc.

The purpose of the research it was not to use the outcome as standards. Since it is based in personal opinion and observation, it was mostly used as an catalog of ergonony aspects to consider later on in the project. The research of ergonomy has mainly been used as an inspiration for new concepts as well for forming the new product.

The results of the research can be found in the appendix.
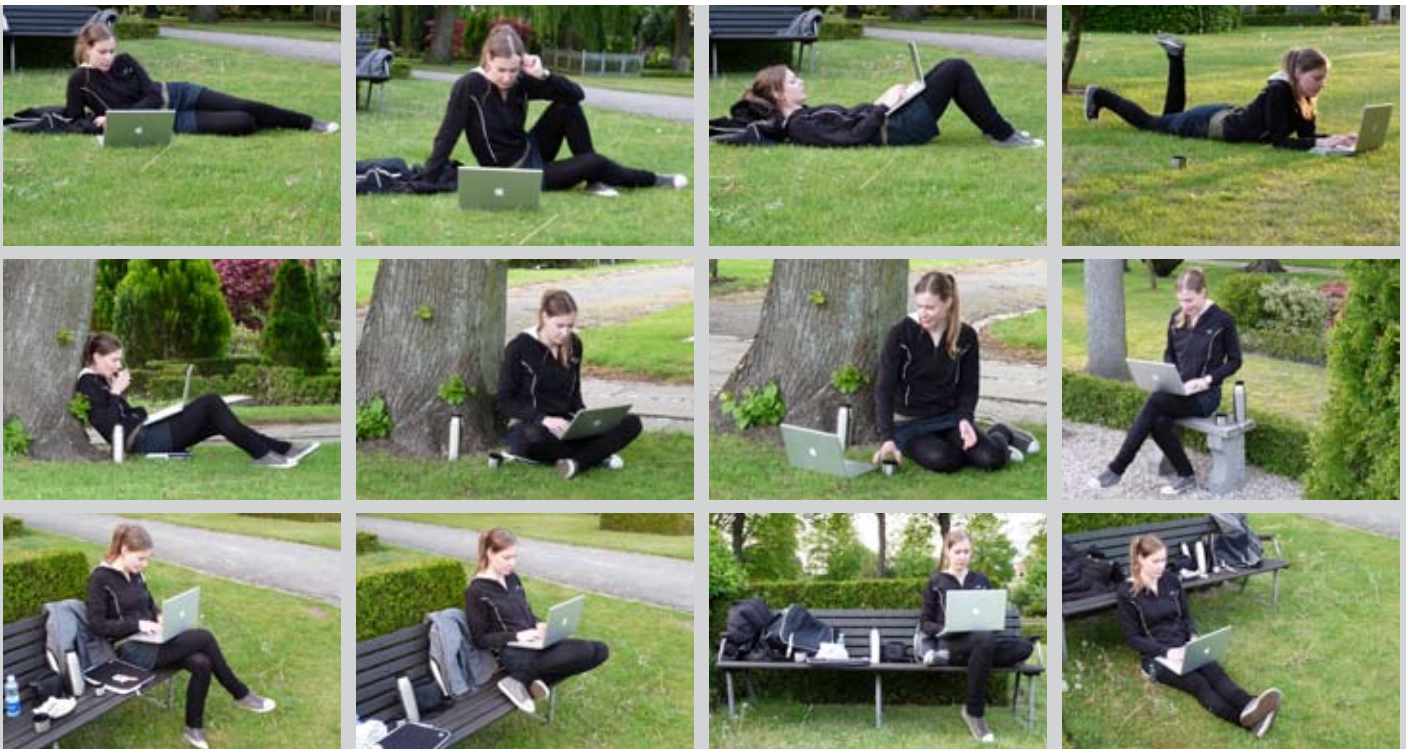
VALUE AND VISION

The objectives of this chapter is to determine the values of the new service and the interaction vision

Value mission

The purpose of the value mission is to state the design goals through key words and get an overview of where the project is focusing.

Metaphors and images clarifying the keywords in relation to the project have been found through mind maps and presented here.

The wish for the project is to achieve the design of a product that will reflect the connection of people with the nature. Rise the meaning of workstation in a more spiritual level and restructuring the traditional work environment.
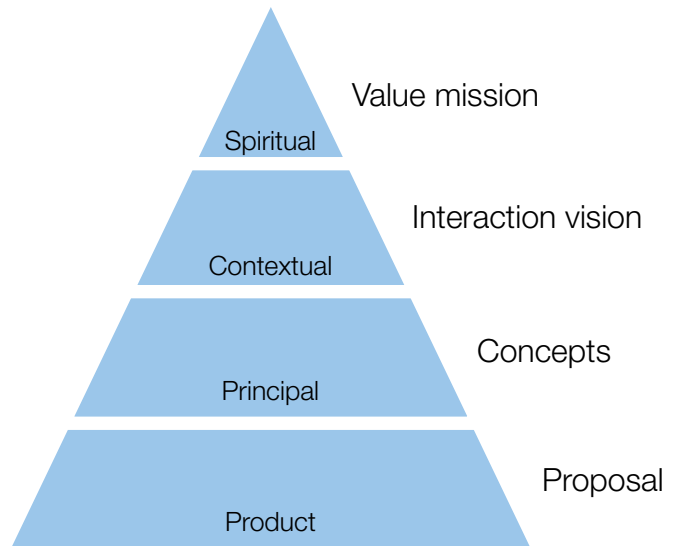
ill. 2.3.1 [Lerdahl, 2001]

Alive

Like being in a concert

Connection

Like going back to your routes

Identity

Like a buoy in the sea

ill. 2.3.2 Value mission

Interaction vision

As with the value mission, the inter-action vision is described by key-words. Metaphors and images are used also here in order to clarify their meanings.

The intention is to create a better im-age of the vision for the interaction between the user and the product. The abstract level of the value mis-sion is becoming here less general and more concrete regards the user and the surroundinds of the prod-uct.

Playful

Like being in the sea with an inflatable mattress

Reliable

Like turn on an apple com-puter

Interactive

Like talking with a friend

ill. 2.3.3 Interaction vision

IDEA GENERATION
The objectives of this project has been defined
as following

Idea Generation is a stage for developing as many ideas as possible without any critisim. The more ideas the higher the chances are that some of them are really valuable. The main methods used for this stage are brainstorming, reversed brainstorming and impluse technique.

Brainstorm
The first step was to write in the paper whatever wa. That

Reversed Brainstorm
In reserved brainstorm, the .... were used as positive statements from which several negative statements were created. These were used as bases on which to create ideas that later were turned into postive ideas.

Sum up
The sum up stage is used to create an overview of the ideas that have been produced so far and to choose which ideas to move forward to the next stage. The ideas were grouped and overlapping ideas were removed using the method of summarizing. When it was possible ideas were combined to decrease the number of those left and to improve them. Lastly, ideas that were not able to be categorized and ones that were not found relevant were removed.

Rouch Sketching
The selected ideas are further developed by small notes and quick skething in order to get a better understanding of the concepts.
Through out this process, two out of four concepts were chosen to work with .

igloo workstation
(provide shelter for rain
and wind)

net - kiosk
buy one time work-
station

pieces of art
several components
used as desk/chair etc

artificial solar
trees

carpet workstation

solar flowers

hidden inflatable
workstation

fountains - waterfalls
use the energy

Workstation

playground / workstation
(use the energy that the children produce by playing)

bike stant / workstation
park your bike - produce
enrgy by cycling

lazy boy for parks

artificial grass hills
workstations one
with the landcape

hich tech
benches

statues workstations

cactus workstations

SUM UP

In this chapter the ideas are summarized and presented through conceptual sketches


Piece of Art
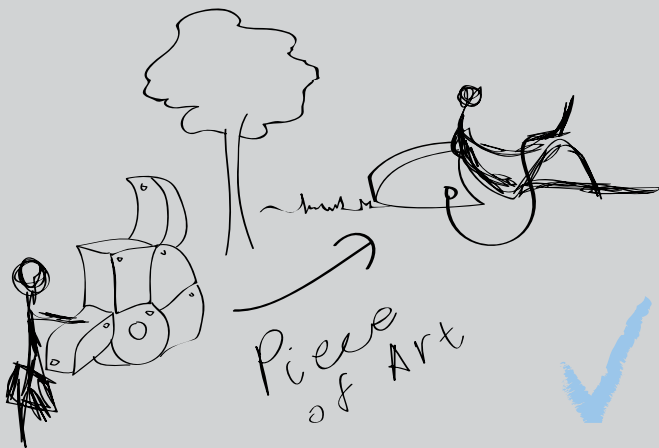
A big statue, composed of different shape/size modules that can be disconnected and used individual as sitting and battery for the laptop. When finish the work, return the module to the initial statue where it is charged again.

Solar trees

Artificials trees collecting sollar energy. The trees work as a power supply to the user but also as sitting and shelter.

Concept workstations
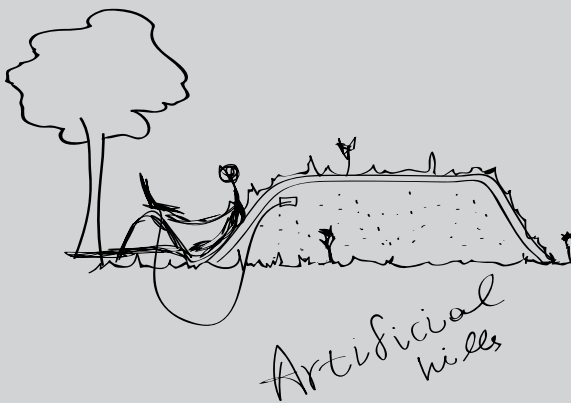
Artificial hills

The concept of this idea is to make the workstations one with the nature. Small artificial hills are rising up in the park's landscape offering to the user power, internet and natural sitting.

Inflatable
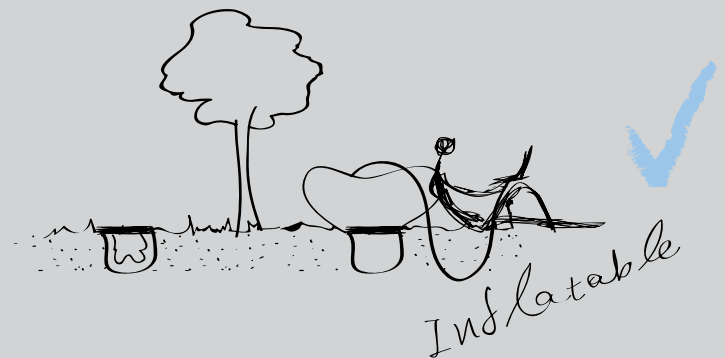
Hide the workstations when not in use. The mechanish is undergroud. When is activated a balloon comes out providing sitting, power and wireless internet.

CONCEPTS

The chapter is a brief description of the two
concepts that were shortlisted

Concept 1:

Inflatable workstation

Idea

The main idea of the first concept, is
to keep the view of the park as pure
as possible when there are no us-
ers acting on it and from the other
hand, change drastically the view of
the park when there are people inter-
acting with it. The product is hidden
under the ground when it is not acti-
vated until somebody chose to work
on that spot.

Observations

Inspired from the flowers and their
cyrcle of life, the product is planned
under the ground and remains there
until is activated by someone.

Difficulties of this project could be on
the technical aspects of the under
ground part of the product.

When the product is
closed it can not be seen
in the park. The product is
planed under the ground
and connected with elec-
tricity and internet cables.

The user activates the
workstation with his mo-
bile phone. Send an sms
to the number writen in
the lid.

The balloon blows up
automatically creating a
sitting for the user. The
balloon has sockets for
electricity. Wireless inter-
net is provided within an-
radius of 5 meters.

Several balloons are
planned all over the park.

ill. 2.6.1 Inflatable workstation

Concept 2:
Pieces of art

Idea
Based almost on the oposite idea of the concept one, the core idea is how the user affects the daily view of the park according to his use. De-construction of the statue's module and construction of it in a different way after the use.

Observations
Based on the idea of people interacting with the surroundings inside the park, the users choose how they will deconstruct the main statue, how they will form the view of the park by spreding all the modules around the park according to their preferences for work and how they will construct the statue again when returning the modules.

The difficulties of this concept could be on design the different modules in such a way that it will be able to fit (attach) all together in a lot and differnet combinations, while having the functions of charging and sitting at the same time.
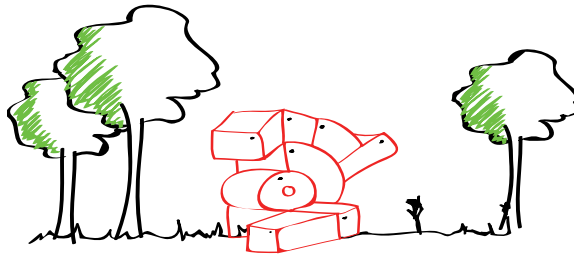
The modules are positioned all together in a central place in the park. When are connected, they are being charged.
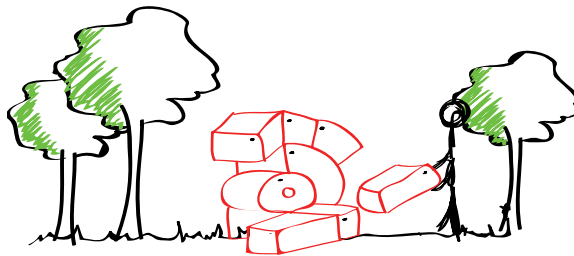
The user disconnects any of the modules from the statue by sending an sms to the number written to the module he wants.

The user choses where he wants to work. The module is used as a battery for the laptop but also as sitting for the user.

When stop working, the user returns the module to the initial spot. The modules can be stucked with differend ways. In the end of each day, the statue has a different shape.

ill. 2.6.2 Pieces of art

35

SPECIFICATIONS

The following chapter describes briefly the specifications of the new product

The product design specifications have been formed through the research phase and contain all the necessary information that should be taken in account during the design proccess.

Performance:

The balloon should be inflated in an average time of 10sec.
The balloon has to carry out a pressure approximately equal to 3 people of 90 kilos at the same time.
The mechanism should be a stable system.
It should be as much quiet as possible during the inflating / deflate precedure and silent when used.
Need only one person to perform the activation

Environment:

Working temperature: The mechanism should be possible to work also at 42 degrees of heat (maximum summer temprature)
The balloon should be resistant to sun rays and strong wind.
Waterproof

Life in Service:

The mechanism is required to work 18h/day and have to work well up to 5 years after use. But it should work until the 10th year without any horrible error.

Maintenance:

The maintenance cost to operate machine is paid for energy usage and internet and in case of a problem it is should be possible to replace only parts.
The energy should be the cheapest and the most efficient one such as electric and the energy resource have to be safety and not damage the machine.

Target Product Cost:

The manufacturing costs, should be as minimum as possible.
The final cost of use should reflect the value of price and not be way over the price of a normal hour in an internet cafe.

Shipping and packing:

The item can be easy to move or ship, the product should be compact without a problem of destroy during the shipping, some parts of the product could be bought separate as regular equipment.

Manufacturing facility:

The machine should be easy to fix and the replacement part can be easy to find or manufacture. The allowed time to manufacture this product is below 1 month. The maintanance of the product can be on the spot without the need of taking it to a service unit.

Size and weight:

After assembly the product should be small enough to be storaged easily. The weight of the product also needs to be light enough so one person to be able to handle with it.

Materials:

The materials that are consider should be environmental friendly since the context of the product is the park. The texture of the material should also be user friendly and related to the surroundings.

CHOOSE CONCEPT

The chapters is a juxtaposition between the two considered concepts and the final choice

Both of the concepts fulfil the needs of a person who want to work in a park since provide sitting, power supply and network. The difference between the two concpets stands on the effect that the products have in the final view of the park and the experience of the user.

The first concept appears when it is in use while the second concept almost "disappears" when in use.
The two concepts evaluated through the level of realization, the personas and the research phase and finally it is decided to work with the con-cept number one, since it is consider more innovative and interesting to work with.
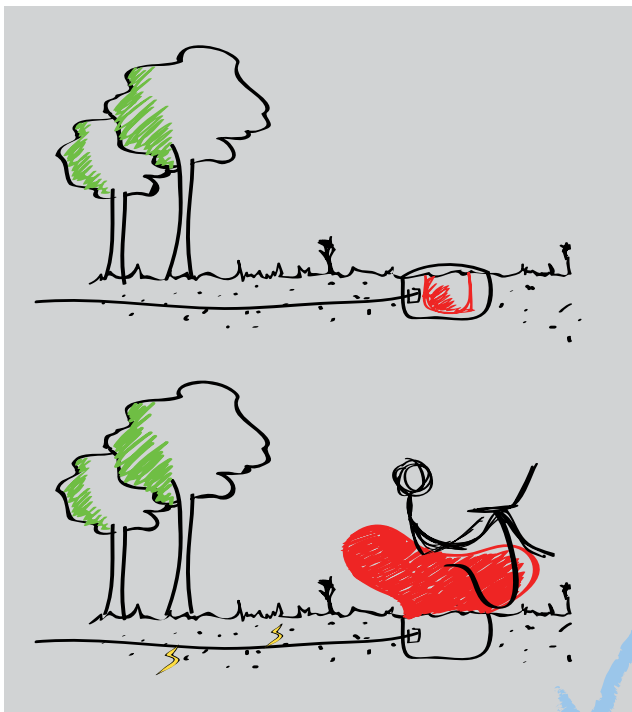
ill. 2.8.1 Shortlisted concepts

Concept 1: Inflatable workstation
Deal with interaction between the park and the humans. How the motion of the people affects the view of the park
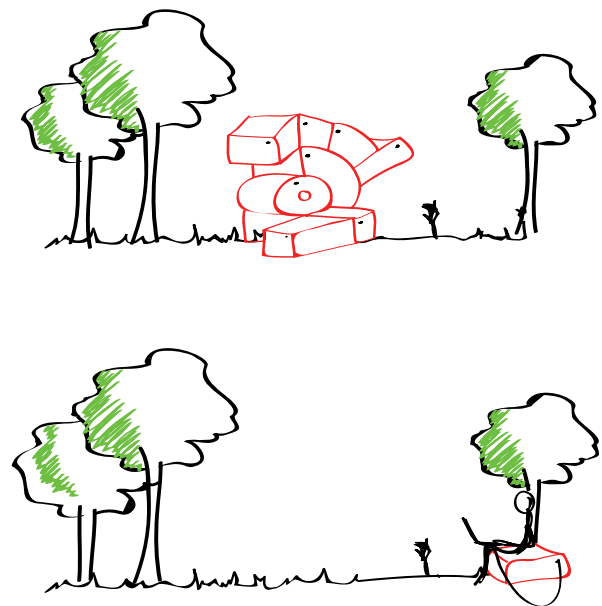
Concept 2: Pieces of art
Deal with the abstract idea of deconstructing a statue and the interaction between the users and the art pieces of a park

A more specific research about the focused working area is carried out. Mechanical solutions for construction issues of the patato and the balloon are given. A shape board is created in order to be used as a tool in the design of the final form.

Subjects covered also in that phase are styling, mechanical and kinematic systems, manufacturing and materials. Finally, the aspects of ownership of the service and booking are considered.

PHASE
THREE
PRODUCT
DEVELOPMENT

INFLATABLE PRODUCTS

The chapter describes the characteristics of the inflatable products

In general, inflatable objects are those that can be inflated with gas, usually with air, hydrogen, helium and nitrogen. Each gas, is used for the different attributes that offers.

The main advantage of an inflatable is that it can be stored in a small space where not inflated, since inflatables depend on the presence of a gas to maintain their size and shape.

Inflation motors

The ways of inflation of the products varies from manually to mechanic or even natural inflation, always according to the purpose of use. The most common and simple way is using mechanic inflation. Electric motors of different power are usually used for small objects while products that require big and continuously amount of air, make use of benzin motors to inflate. The common problem of both electric and benzin motors is the noise that produce when are in use.

Materials

In addition to the common balloon, whose material (rubber) is greatly stretched when inflated, most inflatables are made of material that does not stretch upon inflation.

The choise of the suitable material is usually based on the distinction between high-pressure or low-pres-

sure inflatables. In a high-pressure inflatable, structural limbs like pillars and arches are built out of a tough, flexible material and then inflated at a relatively high pressure. Low-pressure inflatables are usually built of lighter materials. For products that are not made only for decoration but also for real use with people (interaction), most common materials are PVC and Hypalon due to the attibutes that offer.
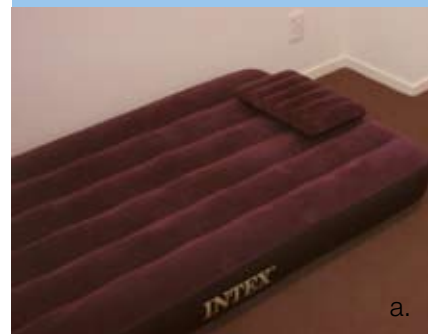
ill. 3.1.1 Examples of inflatable

DESIGN OF THE POTATO

This chapter describes the functions of the potato

In the design of the part under the ground (potato), there are several considerations that have to be taken into account, regarding the size and dimensions as well as the mechanical system.
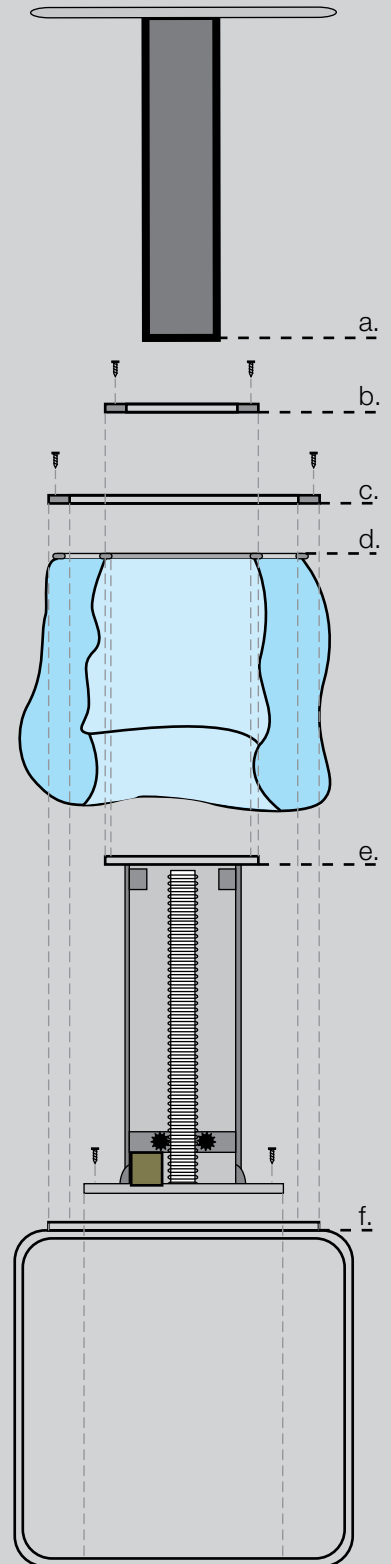
The potato should include the following parts: air booth, electric pump, air chamber or balloon, hose, core, electric sockets

The main functions of the potato are:

- Protect the mechanism ftom water and land
- Provide power
- Provide internet
- Store the balloon
- Control the air flow
- Lift the lid
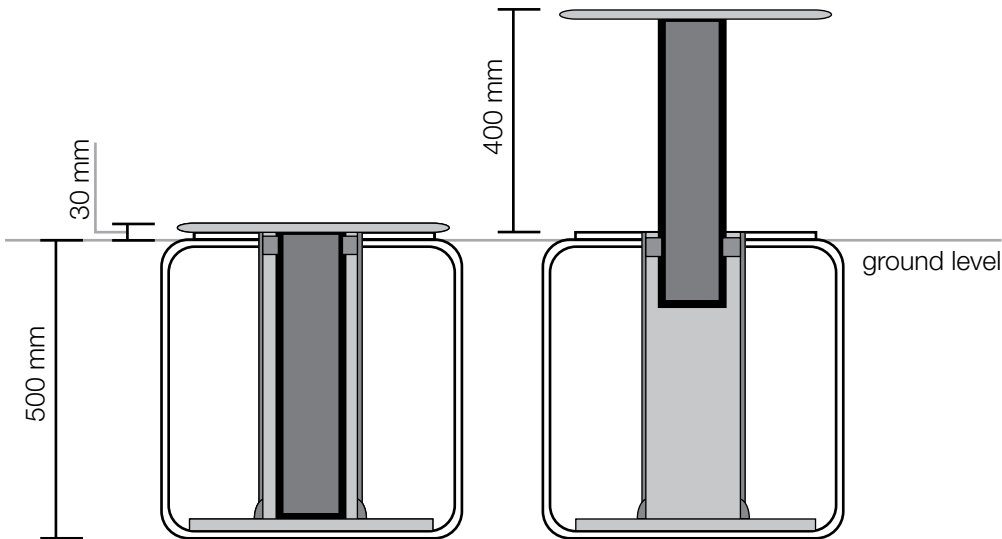
ill. 3.2.1 Dimensions of the potato

ill. 3.2.2 Parts of the potato

DESIGN OF THE POTATO

This chapter describes the functions of the potato

Motion

The potato hides the balloon and the mechanism of the product when not in use. When it is activated there is motion to the system.

Operation

The operation of the potato can be divided to 4 steps:

First: The lifting motor operates to raise up the lid - pad from the lowest position (closed) to the highest (open). When the core reach the highest position, the external air valve opens in order to provide air to the electric pump and inflate the balloon.

Second: The air pump operates to inflate the balloon.

Third: When the balloon is inflated to a determined pressure. The air pump stops. The valve locks in order to keep the pressure steady.

Fourth: When the user decides to close the balloon, the air pump inverts the air flow from inside to outside, sucking all the air that is inside the balloon.
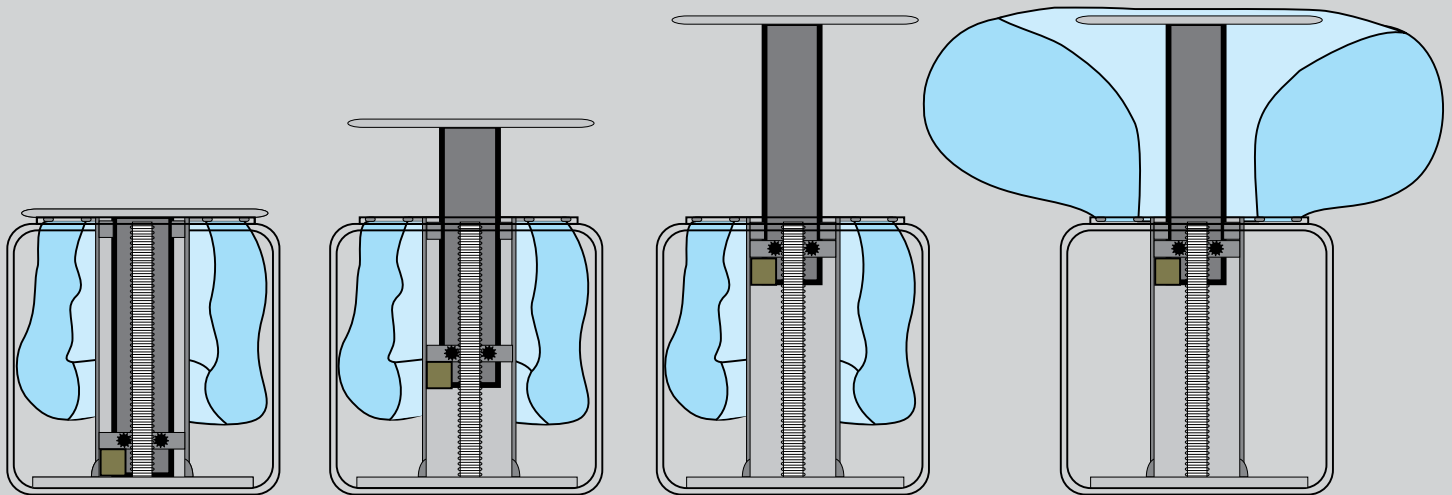
ill. 3.2.3 Motion of the potato

Air flow

In order to be protected from leaves or other garbage from the park, the external air valve is under the main lid. It is exposed only when the product is activated. When the lid comes up, the air goes through the external air valve to the main core and from there it is sucked to the motor where is comprased and relisead again in the air booth. The comprased air makes the balloon to inflate outside the potato. The reverse procedure is followed when the product is deactivated.

Repairing

The potato should be easily accessible in case of problem in the mechanism and general maintanace or even for changing the balloon.

The lifting mechanism is attached in the central core of the product and is easy to get out and repair without the need to unplant the whole potato from the ground.

Since the most exposed and fragile part of the product is the balloon, should be easy to remove and change but also it is consider important to secure that the air will not be easy to escape through the unions of the construction. Rubber endings in the unions has been chosen in order to prevent that. In the picture can be seen the way the balloon is attached.

Two main rings trap the balloon in the potato. The rings are easy to remove and change the broken balloon or even replace it with another one with a new shape or color.
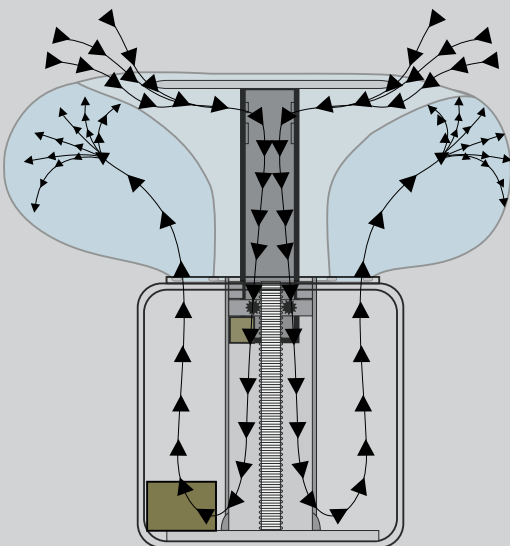
ill. 3.2.4 Air flow
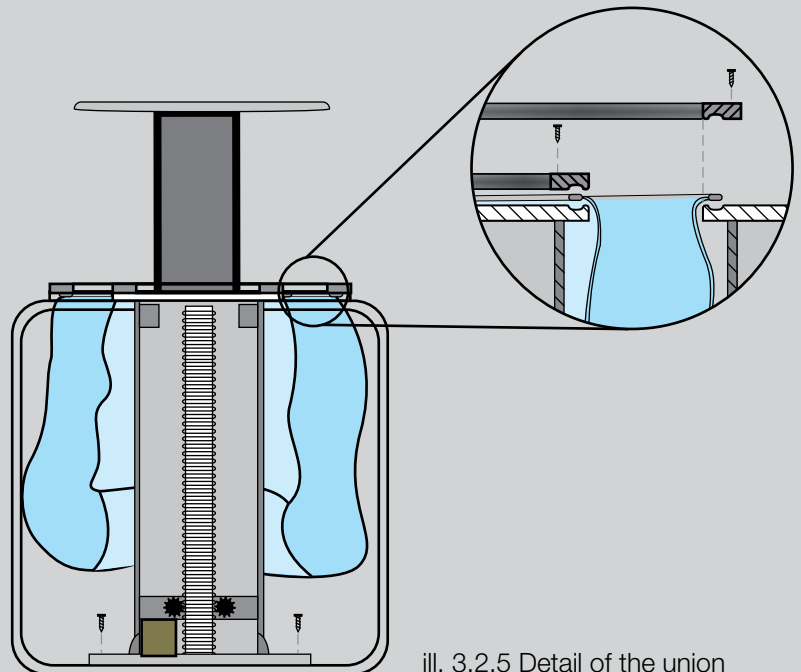
ill. 3.2.5 Detail of the union

MECHANISM

The chapter highlights the mechanical parts of the potato and more specific the two motors

The potato contains two basic mechanisms, the lifting and the inflation mechanism as illustrated in the previous chapter.

Lifting mechanism

The lifting mechanism operates only in the first and the last step of the use of the nectar. In the activation and deactivation of the workstation. In both cases, the forces on the mechanism will be from the central core and the lid of the nectar. That means that the motor used for the lifting operation does not need to be of big power. The size of motors like this one, gives the possibility to be attach with the mechanicm inside the central core.

Inflation mechanism

In addition to the lifting mechanism, one more motor has to be included in the potato for the inflation of the balloon. Since the deflation of the balloon should also becoming automatically, by sucking the balloon inside, the motor has to be able to operate with both air flows, in and out (blow and suck) . The size of a motor of that category can be really small, but since the balloon has to be totally inflated in a specific time, a bigger motor is selected. The motor in the picture is consider ideal, since it can inflate a volume as big as the nectars in less than 10 seconds and the size of it, it is not over 20 x 10 x 10.

ill. 3.3.1 Inflation / deflation motor

POWER AND NETWORK

The chapter presents the connection of the potato with the power and internet source of the park

The Nectar is plant 50 cm under the ground and the only way to supply the potato with power is through underground cables in the park. For that reason, the installation of the nectar, requires a cable infrastructure.
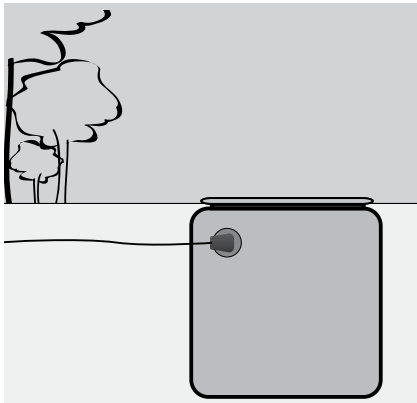
ill. 3.4.1 Cable infrastructure

During the plant, cables for electricity and internet are connected with the potato.


electricity socket 1
2
3
4
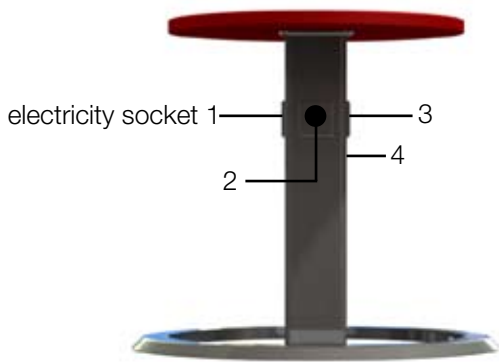
ill. 3.4.2 Electric sockets

The cables coming from the park are connected in a high possition of the exterior surface of the potato. That is for two reasons, for easy placement, since it doesn't require deep digging but also in order to have easy access in case of problem or general maintenance.

The cables go through the internal walls of the potato down to the inflation motor and through the central core up to supply the four sockets and the wifi device.

With green color is illustrated the cable for electricity and with orange the internet one.
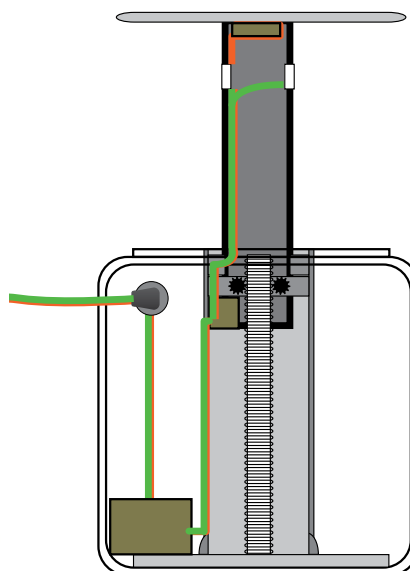
ill. 3.4.3 Wiring
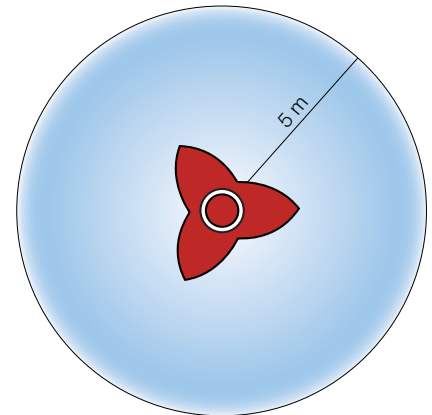
ill. 3.4.4 Internet radius

When the nectar opens and the central core comes out, a wireless internet connection is created in an area of 5 meters radius around the base. The wifi device, is positioned exactly under the lid / sitting, so as to provide better signal for the user. The device is supplied with energy and net signal as it can be seen in the illustration.

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SHAPE INSPIRATION

In this chapter, shape, colors, texture for the balloon are examined

The listed pictures illustrate characteristics, features and inspiration found in the research phase. The board is used as a guidline for the design of the balloon.

a.

b.

c.

Shapes coming from the physical environment. Shapes that offer open and closed surfaces that can be used for laying with a laptop.
Different depths in the shape create shalows, highlights and focus points such as the central core with the sockets.

Clear lines and basic shapes. Forms that can be memorable not only for the user of the workstation but also for the rest of the citizens in the park.

Strong distinguish lines stand out in the surface creating focus points that can be used for making the compilations of the material more interesting.

ill. 3.5.1 Shape board

Playing with the physical light. Forms that work with dark and light, creating shadows and noticible forms in the park.

Interesting texture in the surface of the product in order to give to the user a feeling of a more natural touch.

The use of strong colors can be applied to highlight the product inside the green surroundings. Combined with fine materials, it is a good way to identify the nectars that used in the park and give a new impression to the view of the park.

FORM OF THE NECTAR

This chapter deals with the design of the aper part of the product, the balloon

The initial sketching proposals for the upper part of the product, are done in consideration with the results from the ergonomy analysis of the park, the shape board inspirarion and the general feedback from the interviews and the research phase. Based on those, the form that is designed is more abstract and leaves the user free to play with the balloon and choose himself how to use the sitting surface.

The idea was to avoid a form that would reflect the image of a normal office workstation, something that would look like a chair or a bench for example.

The form of the nectar is based more on the natural forms that somebody can find in a park. In that direction, simple forms where examined and the focus was more on how the form of the product can be produced easily and achieve maximum use from the user.

The form of the balloon is indicative for the project and not the only possible solution. Since the potato and the mechanism remains the same, the balloon could have any shape or color. Here, it is presented one solution.
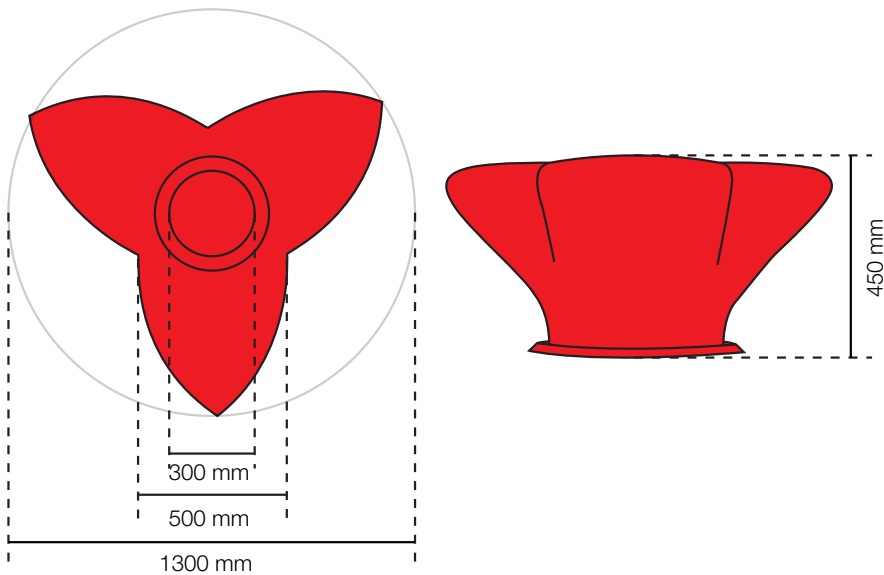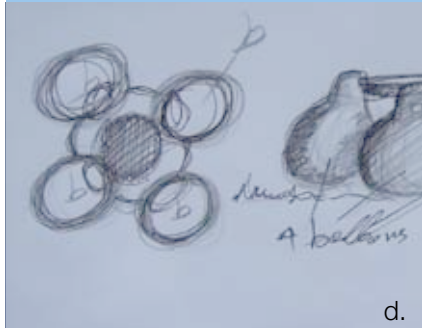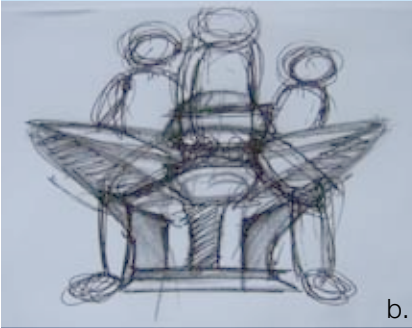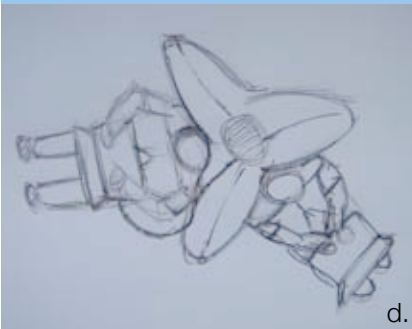
ill. 3.6.1 Dimensions of the balloon

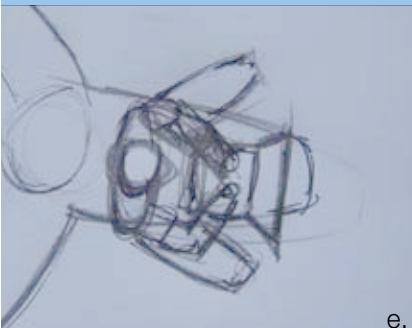ill. 3.6.2 Sketches a

a.
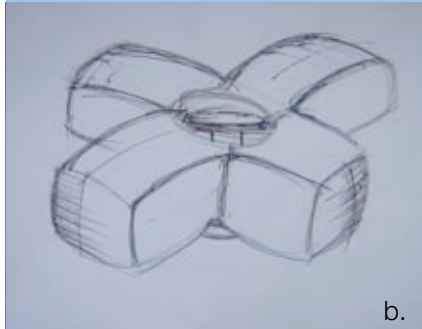
b.

c.

d.

e.

a.

b.

c.

d.

e.

The balloon has been designed in such a way that it will offer to the user as many combinations of work as possible. From one person sitting with the laptop standing in the balloon infront of him to multi users working laying their back in the opennings that the shape creates. The pos- sibilities of balloon are many since the user can decide to work also in the grass and just use the nectar for power and internet source.
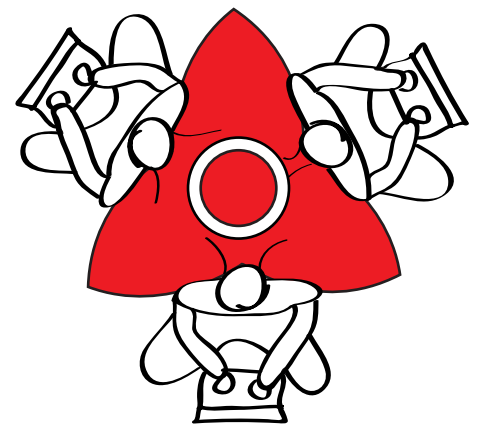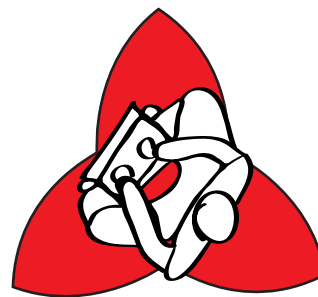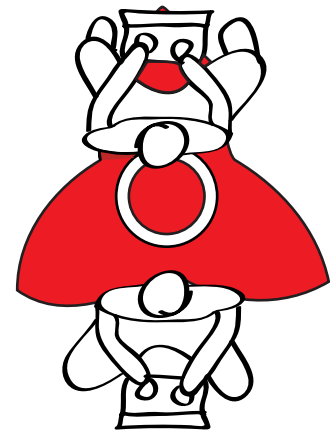
ill. 3.6.3 Sketches b   ill. 3.6.4 Examples of use

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FINAL PROPOSALS

The following chapter is a presentation of the
final product

An effort was made to hide from the fi-
nal shape the main constructions and
the functions of it.
Looking back at the shape board,
clear lines, characteristic and memo-
rable shape have been achieved,
while the color that has been chosen
for the example balloon highlights the
position of the product in the green
backround of a park. Also the shape
creates surfaces that more than one
person can use.

In the illustration above, it is the motion
of nectar when it is activated. Start-
ing form the straight lid in the ground
when it is not in use, rising up the cen-
tral core and blowing the balloon until
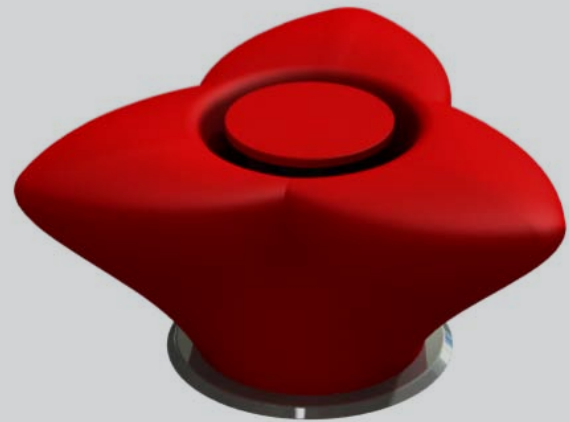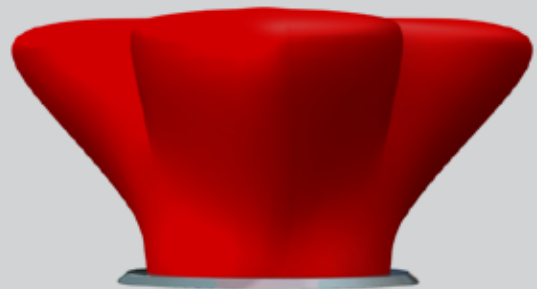it reaches the final shape.
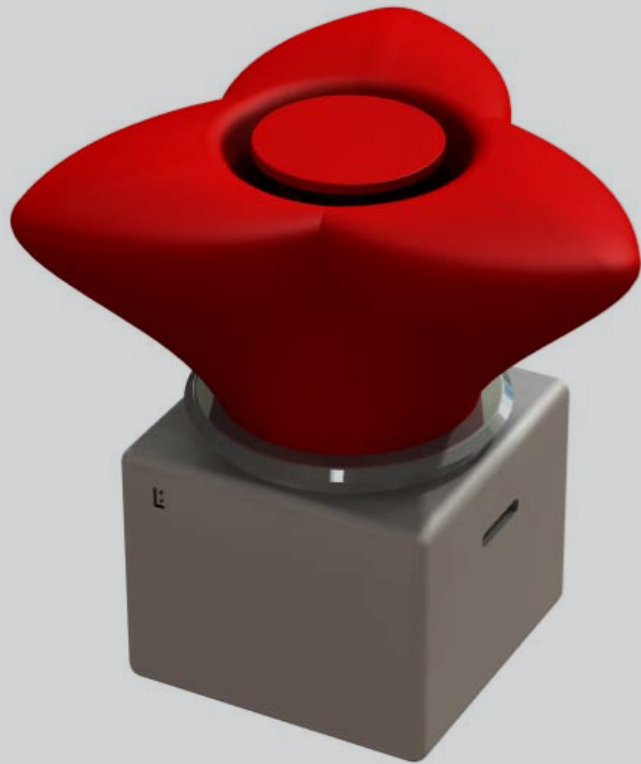
ill. 3.7.1 The final form
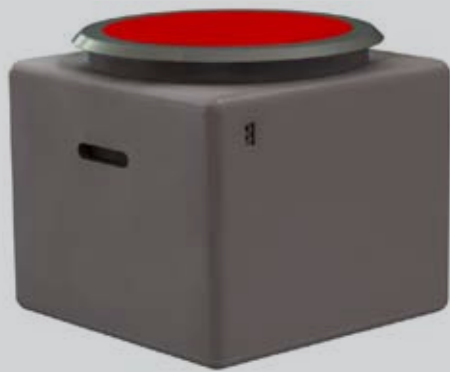
ill. 3.7.2 The potato

ill. 3.7.3 The balloon

ill. 3.7.4 Motion when activating the nectar
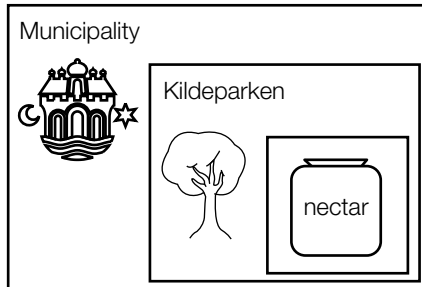
51

FINAL PROPOSALS

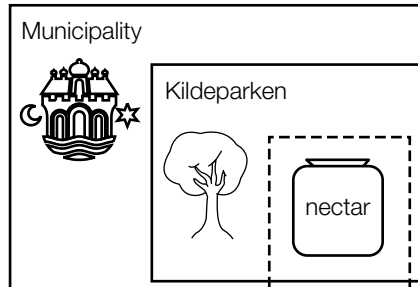The following image is an example of the product inside a park
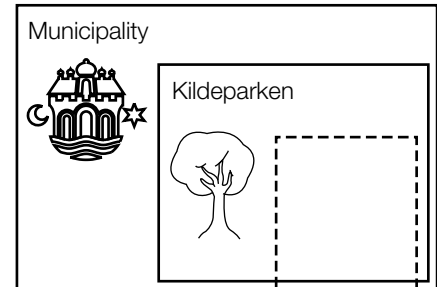
OWNERSHIP

Three different cases are consider as possible owners of the system

Indoor

Outsourced

Exterior

ill. 3.9.1 Cases of ownership

Case 1:

The municipality owns and runs the nectars. A manufacturer produces the products for them. A new department is introduced, that takes care of the procedural aspects of the service.

This scenario, although could be the ideal since the municipality handles all the aspects concern the public spaces of a city, it is not so feasible since it requires to run a new department within the municipality that will deal only with this section. Something that is not of such an interest fot the municipality.

Case 2:

The municipality owns the nectars and the infrastructure but outsource the management of the service. Possible companies to rent the infastructure in order to make business, are interent providers, (stofa, TDC, cibercity), companies deal with electronics and hardware appliances or also companies focus on public furniture and want to extend their business as service providers.

In that scenario, the municipality runs competitions where the winner takes the control of the service for a specific period (some years).

Such way of give cooperation between private companies and the municipality exist in the public toilets, where you have to pay in order to enter, or for example the storage rooms (lockers) in the train stations.

Case 3:

An exterior copmpany decides to produce the nectars and establish the new service. In aggrement with the municipality, make use of specific areas in the park.

This case it is possible that is coming against the free competition rules of the market and so to be consider illegal by the danish legislation.

From the three cases, the second one is consider to be the most appropriate for the specific project.
The method of outsourcing parts of a municipality's service is a common method to provide to the citizens goodies without increase the operational costs of the municipality.

BOOKING

This chapter sums up the considerations about booking a nectar from home and the final decisions

An important issue of the service is the ability to book in advance a nectar or not. Several considerations regarding the user and his expectations when goes to the park carrying a heavy bag with his laptop, to the management of the data in the system were taken into account.

Here are the basic scenarions that were examined:

Case one: Spontaneous use

The main idea behind the nectar is the freedom of choice to work in a park without limitations of power supply, internet connection and more. In that context, the nectar should be there and available to use any time without any booking.

In case of spontaneous use only, the information for the people who are at home and want to visit the park are eliminated (carry the laptop or not?).

Case two: Booking

The system gives you the ability to book a workstation as many hours as you like, even a whole day. The user is charged no matter if the nectar is activated (use) or not (the user decided not to go to the park).

In this case there might be the problem where somebody is in the park and wants to work spontaneously but all the nectars are taken although non of them is used at the specific moment.

Case three: Time booking

Able to book a nectar from your home accrording to the hours you assume you are gone work in the park. e.g. book today for three hours after I finish the danish lessons tomorrow.

The booking is achieved throught the web site of the system. You find the one you want to work to and you book it for three quarters. The workstation is marked as "booked" in the web site. If the user does not arrive on time at the park, then the nectar is open again to anybody who wants to book it or use it on spot.

Case four: Status shared

Since the central core of nectar provides four sockets and since the design of the balloon offers "sitting" for more than one person at the time, the case of shared booking is consider. The user can book from home and chooce the status of his nectar. Booked or shared. Which means that you want to share the workstation with somebody else and split the cost.

Case five: Multibooking

The system should give also the ability to a user to book more than one nectars. Based on the personas, and the habits of a seventeen years old boy like Casper Gerhar, it is examined the case of booking more than one neighbor nectars.

In order to provide to the user a variety of alternative ways to work with a nectar, several cases for booking were chosen for the system. The case of time booking and the ability for shared status was chosen. Of course, spontatenous use without any booking is support from the system. In Addition, multibooking for the users is offered.

NECTAR IN THE PARK

In the following chapter it is presented the position of the nectars in Kildeparken

The position of the nectars on Kildeparken's map was made with two basic guidelines.

The GPS analysis

The GPS analysis provided input to the project about the movement and the duration of stay of the users today. It is believed that the nectar, used as a working point will change the view of the map drastically. In that context the gps analysis used more as tool to identify how is the situation today, and not as plan for the new system.

Uer research and Personas

The most important aspect to the position of the nectars where the feedback from the users and hypothetic scenarios with the personas.

For example looking at the case of persona number one, Anders Pedersen would search for a quite place away from noise points such as the paths, the fountain and the playground, in order to enjoy his work. For people like Anders, several nectars has been positioned away from the tall red squares of the map on the right.

In the case of the second persona, Birthe Jacobsen, it is important for her to work somewhere around the playground in order to have continuously eye contact with her daugther who is playing. Based again in the gps analysis and the place where people usually stay around the playground, some nectars positioned in a broad radius around that.

Examine the last persona, the young student, Casper Gerhar, the idea of a combination of nectars came. Children at the age of Gerhar are used to meet in big groups (seven, eight or even more) at the park and then go for online games in an internet cafe. The idea of these games is the social gatherings. In an attempt to transfer this atmosphaire in the park, combination of nectars are proposed. This means nectars positioned so closed to each others in order to make the communcation between the users possible.
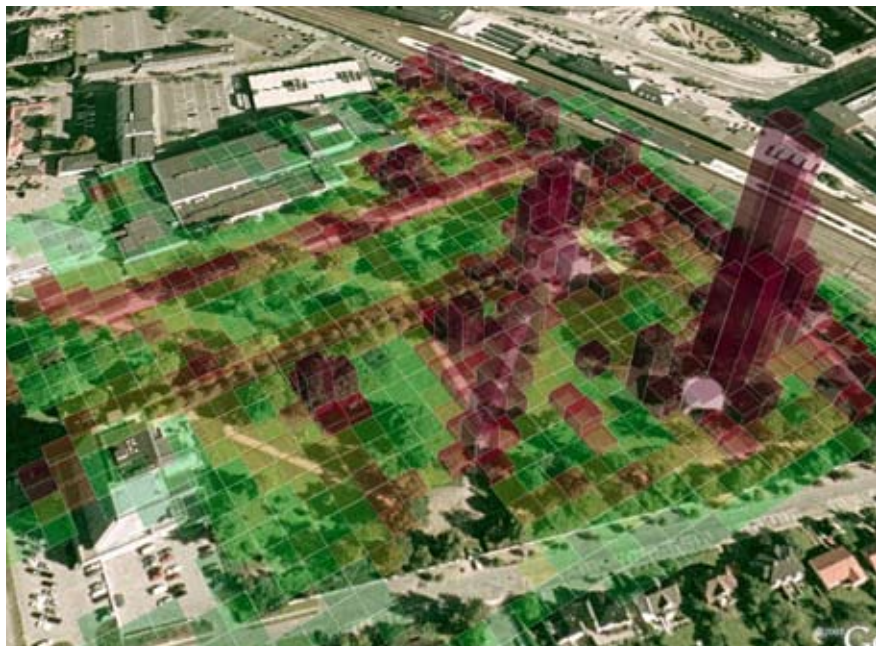
ill. 3.11.1 GPS map
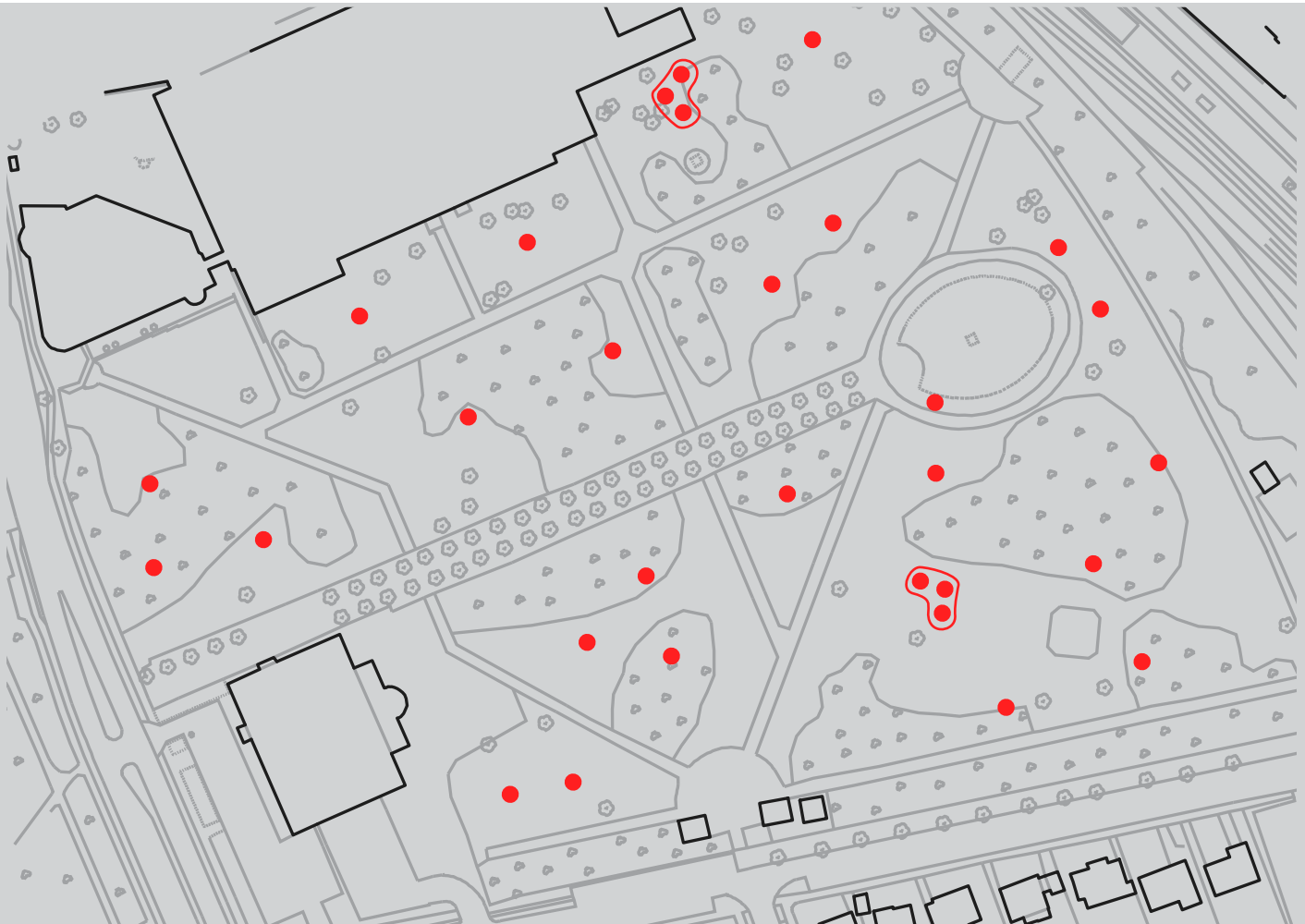
ill. 3.11.2 Position of nectars in the Kildeparken

Single nectar

Combination of nectars

The number of nectars positioned in the park in an initial stage it is decided to be thirty. If we consider that each nectar has a power socket ca- pacity of four laptops the number of possible users is up to 120. The number of nectars can change according to the results of the use.

MANUFACTURING AND MATERIALS

This chapter presents the manufacturing techinques and the materials that were taking into consideration for the product

In order to have a basic idea of the production process, different manufacturing techniques and materials are considered and presented here.

Since the potato is planed under the ground it is consider very important to be as enviromental friendly as possible.

The lid is the only part of the potato which is above the ground. It is the part that protects the mechanism and the balloon from weather conditions and vandalism when it is not in use.

Material: Aluminium
Manufacturing technique: Flame jet cutting and welded

The best solution for the environment providing good protection to the mechanism at the same time, is a 70% recycling plastic.

Material: Polythylene (PE)
Manufacturing technique: Rotational molding

The electric socket as well as the internet sockets and the cables, are standard components from the market

ill. 3.12.1 Materials of the potato

The user interacts only with the upper part of the product and mainly the balloon. Apart of the human effect in the product, which varies from sitting, pushing, laying, touching etc, the balloon should be durable in time but also against the weather conditions, with basic problem the strong sun.

The moveable part of the lid. Since It is also used for sitting, made of hard PVC.

Material: PVC
Manufacturing technique: Rotational molding
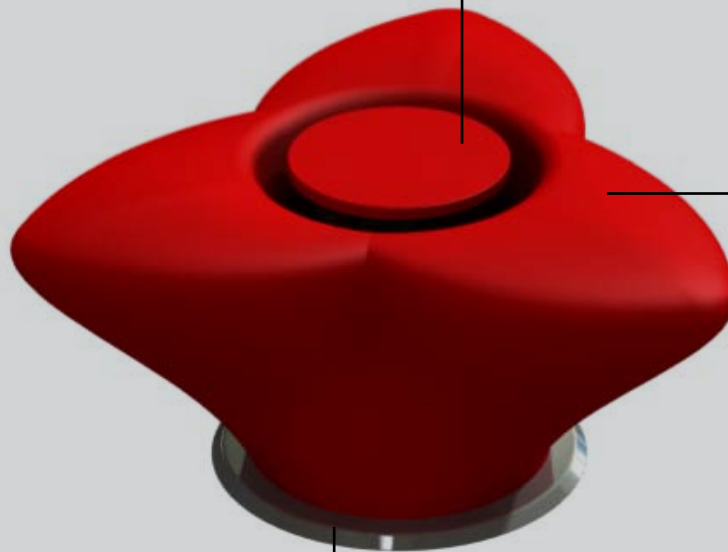
Two materials considered for the balloon, hypalon and PVC. Although the first ones offers better durability under the sun, due to financial aspects, PVC is consider more suitable

Material: PVC
Manufacturing technique: Compilations of parts

The aluminium ring, it is screwed in the top of the potato

Material: Aluminium
Manufacturing technique: Flame jet cutting and welded

ill. 3.12.2 Materials of the balloon

BRAND

The chapter introduces the name and the logo of the new brand built around the product

Based on the values that the product should reflect, a characteristic name is found in order to create and support a brand for the product.
A short brainstorm with possible names was carried out and evaluated on criterias such as innovation and memorable links.

Nectar, was the name that stand out from the others and that was basically because of the associations that creates in somebodys minds. Based on the movement of the insects inside a park, trying to find their food, nectar. In the same way of thinking, people are trying to find their workstation somewhere around the park.

The name also has to be supported with a logo that would fit in the product's profile. The following logo has been designed for that purpose.

ill. 3.13.1 Logo of the nectar

The last part of the project is an evaluation of the final product and a reflection upon the whole proccess.

PHASE FOUR
REFLECTION

REFLECTION

A general evaluation upon the master thesis theme, the process and the outcome

The task of working with a product's physical and theoritical development was both difficult and challenging. The main focus of the project was to cover in an acceptable level both the front office and the back office of a service designed to cover a specific need of the people.

Project focus

The semester of the thesis started with a complete different topic and a point of view almost opposite than the one presented. Unfortunately, the initial concept, a new service for bike stores, came out to be extremily big and unsafe project for one-person work in a duration of 5 months period and the change of subject was consider necessity. Soon after the status seminar, the project has been started from the early beggining.

This shift of the theme has resulted in spending valuable time on the first phase of the semester and cause a lot of frustrations and stress during the process.

From the other hand, it could be characterized as an interesting aspect in terms of real life projects, deadlines and restrictions. The shifting of the project can be described as probably helpfull in complete understanding of the size and the complexity of the projects that one person can handle.

Process reflection

The effort of the thesis was to present a shift focus towards the technicals aspects of a product design project and interaction between actors in a service design context. When examing this project in perspective it is clear that the depth of each section it is not particularly explanatory consider the importance of the information provided. The evaluation of the process according to personal targets seem to be partly accomplished.

However, one of the goals that has to be highlighted is the goal of being able to describe a product through different point of views and creating an image of use for a product that is new in the market as idea.

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CD

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