

INTERACTIVE SPACES

Aarhus University 2013/2014



The Greenhouse at The Botanical Garden Aarhus

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Introduction

In the course Interactive Spaces we were given the assignment to create an interactive prototype for either The Steno Museum or The Botanical Garden. Throughout our design process, we have chosen to focus on and work with the tropical space within The Botanical Garden. In the beginning of the course, we were on a guided tour where Kamma and Karen presented some of their ideas and problems linked to the exhibition at The Botanical Garden.

One of the problems revealed through the tour with Kamma¹ and Karen² was how to pass on information about the plants and trees in a more engaging and understandable way. By using the literature from the course and feedback from both the teachers and Kamma and Karen we have created a final concept. This concept contains a mobile application and physical installments that makes an engaging and educational learning experience for children and their families. Through the concept, we attempt to make visitors explore the tropical space and seek information about plants and how the nature relates to humans. We do this without disturbing the current aesthetical experience that exists in the space.

In this report, we will start by introducing our final concept. In the following section we describe our design process and the various choices we made from the initial idea generation, to the final concept. Ultimately, we will reflect upon and discuss the choices we have made.

Concept

Our final concept is an addition to the tropical space [Appendix 4A+B] in the The Greenhouses at The Botanical Garden. At the moment, the room is arranged like a museum, although, it allows for more explorative behaviour than what one would see at a regular museum. The reason for this is that they let the audience take a journey through this climate zone and let them discover how the different plants have adapted to this kind of landscape. Furthermore, they have not used any objects that obstructs the interaction with plant and trees such as wires or glass showcases.

Together with the other exhibitions at The Botanical Garden this place aims at giving the audience a sensual experience of the plants' diversity and an insight into how technology and science affect our lives. This is done to convey the interplay between nature, humans and science. The purpose of our concept is to let people explore plants at another level, and thereby let them discover other aspects of the plant by letting them see the plant at a

¹ Curator at The Botanical Garden

² Biologist at The Botanical Garden

microscopic level. Furthermore we want them to learn about how the technology today makes it possible to distinguish and identify plants. The aim is to give people the opportunity to explore the space in a different way to learn how comparison of DNA sequensis can help identify plants. This would then lead to a better and different experience for those that participate.

We draw on inspiration from how real biologists work and how they distinguish plants from each other. By doing this we bring the audience closer to some of the other uses of The Botanical Garden, that is, the science and educational purposes. Through our work in this course we found that the best way for doing this without undermining the sensual experience of the space was to make people engage on their own terms. This resulted in an application for peoples smartphone that will give them the possibility to learn about plants and biology. This application will be offered to the visitors at arrival through location based services but will still be available for download when discovering the magnifying stations if one should chose to interact with these.

These stations are used to get the DNA samples for the application and also to indicate which plants are a part of the game. This is done by placing the smartphone in the designed holder in the station (see figure 1). In addition to the magnifying station, the concept contains empty name tags that will contain the name of the investigator and the identified plant when completing the DNA comparison.

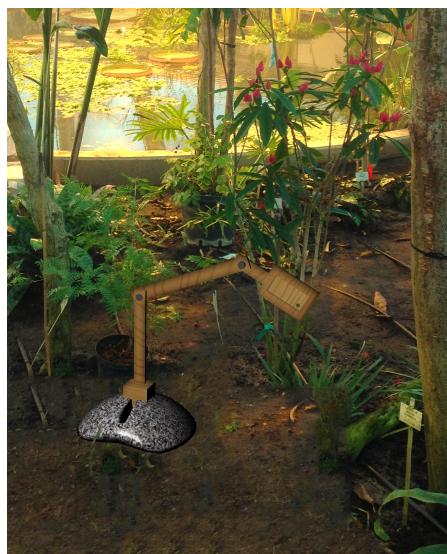


Figure 1: Concept of magnifying station

The concept of the application is a game that teaches people to compare DNA sequences by placing the smartphone on the magnifying stations and exploring the plant by taking close-up pictures. This will trigger the application to collect a DNA sample from the plant. The sample is used by the visitor to compare the sequence with a small database with known DNA sequences. To minimize the choices, the visitor can check out boxes with some

of the characteristics of the studied plant, like if it have thorns and hair on the leafs. This will reveal the DNA-sequences from plants with only this element.. In the end, the visitor will be able to find the right DNA-sequence that will give a correct match. Visitors will be rewarded with info about the plant, some fun facts and lastly the name tag next to the plant will show the name of the plant as well as the name of the visitor who identified it. The name will be visible for one minute so e.g. a family have the chance to talk about it, and afterwards give other people in the space a chance to do it for themselves.

Design Process

We took our starting point in the space analysis and the desires and wishes that Kamma and Karen told us when we first visited The Botanical Garden in the beginning of the course. These desires namely included how information and specific contexts about the plants could be enhanced through technology thereby, hopefully, making it more interesting, educational and engaging to visit the space. Furthermore Kamma and Karen wanted to somehow persuade visitors into exploring the narrow paths in the room.

We analyzed the space accordingly to Bek's - fem rumskabende faktorer [Bek, 1997]. The visual-experiential and aesthetic aspect of the room, shed light on how the use of organic materials throughout the room created an aesthetical experience. The butterflies and the dense vegetation only added more value to this experience. In the brainstorm process, one of the main objectives were to preserve this important aspect of the space. Furthermore, according to McCullough - Digital ground [McCullough, 2004] technology should not be used to change the functions of a room, but enhance and communicate the functions already in place. Therefore, we wanted to build on and not change the aspects already in place.

This was why our brainstorm session was based upon creating a concept around the keywords; exploration, engaging technology, enhance the current properties and functions of the space, and how to use technology to convey information about specific plants and trees. Our targeted audience were children and families.

In the next section we will provide an overview of 3 iterations based upon various feedback sessions. We will not present all of our ideas, but mainly focus on those who laid the foundation for our final concept.

Overview of Design Iterations

In this section we will describe the different choices that affected the final concept. The process is divided into three iterations where each explain the process up until a feedback

session was conducted. We start by presenting our primary ideas and hereafter how the concept developed into the final concept.

Iteration 1

From the outset of the before mentioned keywords we constructed two concepts that fulfilled our initial requirements to a greater or lesser extent. The first one, which we will call *The Cardgame*, was based upon the idea of carcards where different information such as speed, machine power and so on, could be found beneath the picture of the car. Instead of information about cars, we would present information about plants and trees. The arguments, choices of this concept was as follows:

When a visitor enters the Tropical Room, the first thing they will see is the observation tower from which one can get an overview of the whole space. This would be a natural place to start the exhibit which is the reason why we would introduce the game on top of this building. Here, there would be a poster explaining the game and a QR-code that people could scan with their smartphones and download the application. Hereafter the participant could start the game and explore the room to find the plants and trees.

In advance, those plants and trees with the most interesting abilities and functions in the tropical space where chosen to be used as a “*plantcard*”(figure 3). When the visitors are walking around in the tropical room, they can see where each of these plants are situated. We do this by using a map that reveal these locations on the smartphone (figure 2). When a visitor gets near one of these plants, an associated sensor would send a message to the smartphone in range, telling it, that it is possible to take a picture of a nearby plant. This picture would then be converted to the “*plantcard*” with information about the plant . When a user has collected a plant, it is saved in a directory and when the visitor finishes the visit, he or she can play with the “*plantcards*” they have collected against the rest of their family through their smartphones- similar to the original cardgame, just with digital cards instead.

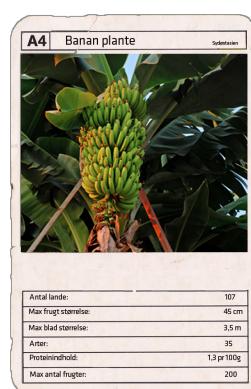


Figure 2: Map over the stations

Figure

Compared to the keywords which we designed from, such as exploration, a game like this would let the visitors explore the room and the narrow paths depending on which plants we choose to investigate. Moreover, by using an application we take advantage of the trend of smartphones which we believe the majority of the visitors will carry with them, thereby lowering the boundaries for participation. Especially within the targeted audience. Furthermore, by using an already known game and an element of rivalry and competitive forces between family members, such a game would let those interested engage in the learning of the plants in other ways that they would normally do.

From the space analysis and the findings, we did not want to damage the aesthetical experience by creating a major installation that would change the focus from the tropical landscape to something that did not fit into the context. We believe an application like this meets this requirement.

The second idea, which we will call *Biologist for a day*, incorporated the design aspects of exploration and engaging in the work of a biologist. This concept was supposed to be installed in the foyer of The Botanical Garden. It consisted of a microscope and a tent that worked as a laboratory. When a person walked through the tropical space they had the opportunity to collect specimens of predetermined plants and trees, and take the sample with them to the laboratory. Here they could inspect the leaf through the microscope (figure 4) and identify it by comparing it to pictures of different plants. Thereby simulate the work of a real biologist.



Figure 4: Leaf through a microscope

We presented the ideas to Kamma and Karen to get feedback and guidance according to their wishes. Some of the general issues presented referred to the aspect of a time-limit and concerns towards maintaining the attention from the visitor throughout the game. The idea *biologist for a day* had some interesting aspects such as watching the leaf close up so you could see all the different structures. Furthermore, both concepts allows for free exploration

and lets the amount of interaction involved be up to the visitor himself. Although, the way biologists now identify plants is by using DNA and not looking through a microscope.

Kamma and Karen believed that the advantages of the *The Cardgame*, was that it could enhance the social experience by engaging the whole family. Both while they were at The Botanical Garden, but also when they left the place. On the opposite, they were not to keen about the idea of placing a poster on top of the observation tower since it would draw the attention from the plants and trees beneath to the poster.

Another aspect they were troubled about, was the element of competition and rivalry. Implementing such aspects would probably cause the participants only to look for flowers involved in the game, and forgetting those that were not.

The aspects we chose to take into consideration in the next iteration were therefore: Free exploration, the opportunity to inspect plants, another way to introduce the game and further development of the concept so that it does not draw attention from the rest of the room.

Iteration 2

After the meeting with Kamma and Karen, we took the before mentioned feedback from the different elements, and channeled the two ideas into one. Thus, the new iteration contained themes regarding exploration and the possibility to act as, to some extent, a biologist using a microscope to look at plants.

The concept still builded around the platform of mobile devices such as smartphones, and the use of those to analyse and identify the different plants. Kamma and Karen was pleased with the idea of the opportunity for the audience to have something to take home. Which is why we in this step chose to stay with the “plantcard” as a reward. Furthermore we still implemented the map for the users so that they could see where the different unidentified plants were placed.

In this phase we also came up with an early layout for the application. As seen in figure 5, we did a quick mockup of how the user should compare the different types of DNA with the one gathered from the plants.

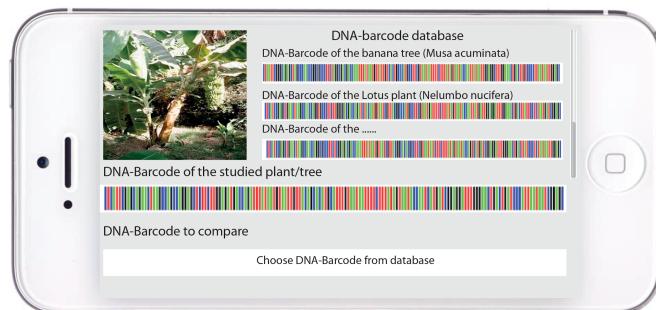


Figure 5. Early layout of DNA comparison

This iteration was presented in a feedback session with Ted Selker³ where some of his remarks and feedback, made us think and reflect upon different aspects, that impacted the final outcome. To summarize some of the feedback and ideas; we were asked if we could rethink the “plantcard” idea and explore other ways to create some kind of competition. In addition we were presented with a time aspect for making it challenging, and to make it possible for the application to be downloaded immediately when entering the room. Lastly he suggested some specific ideas regarding the DNA comparison and the opportunity to see other players progress in the game.

The feedback was processed after the session and was used to make a new iteration. Here we considered the aspect of a time limit, but found that it would have an impact on the aspect of exploration in our concept - making it chaotic - and thereby not improving it. We also iterated on the “plantcard” and found it making the concept to broad and confusing. Thus, choosing to discard it, and focus on the possibilities enlisted in the space. Further we implemented the idea of prompting the users for an application download when they entered the space. Lastly we tried to rethink the DNA comparison of the plants and decided to make it, so users would learn some characteristics about the plants and also how it is illustrated in a DNA barcode, without making it too scientific. All of this lead to the last iteration as presented in the next section.

Iteration 3

In this phase, we used the feedback from Ted to create a low fidelity prototype using *Presentation Link* [Presentation Link, 2013] to show the outline of how it should work. The prototype contained the new design choices as mentioned above[Appendix 3A]. We presented the concept using this prototype to Kamma and Karen and extended the feedback session with *Design stories* provided by Parrish [Parrish, 2006], where you can e.g. design stories during your design phase of a project to explore an episode of use, communicate the design to clients and explore a wide range of learner responses. We made three stories/scenarios where three different situations played out [Appendix 2A]. These were.

“In telling fictional stories we use imagination to create scenarios that help us learn things about our the world that would not become apparent through analysis. It is this quality that makes story a likely tactic used by designers in formulating their design.” [Parrish, 2006]

By showing this prototype and reading one of the scenarios aloud, made it possible for Kamma and Karen to give some palpable feedback. They both liked the current idea where

³ Guest lecturer - <http://www.cmu.edu/silicon-valley/faculty-staff/selker-ted.html>

you examine the plants by using your smartphone and thereby identify the different species by comparing the DNA related to the plant with the database of DNA that exists in the application. This makes it possible to participate in the game but also makes sure to embrace those who just want to walk around the garden without using their smartphones.

Although, Kamma and Karen also commented on, to some extent, a problematic design feature. If we did explain shortly what DNA was when using the application, children may have to ask their parents what it is, and if they cannot answer the question, we believe that it will put them in a sort of embarrassing position. Therefore, we have to create a concept that is understandable for both the children and their parents to create a more social and enjoyable experience.

The lessons learned from the last feedback session with Kamma and Karen was to make sure that the focus from the visitors still was directed at the whole experience and the plants even though the visitor used the application. Finally the meeting with Kamma and Karen lead to our final design and idea by considering and discussing all the feedback throughout the course and different presentations sessions. The results from this feedback is presented in the section Concept.

Reflection/Discussion

In this section we will discuss and reflect upon the final concept. We will do this in regard to the choices we have made throughout our design process. One of our major concerns was to maintain the aesthetic and visual elements that the space supported. Furthermore, we had to take the purpose of dissemination of The Botanical Garden into account [Kamma, 2013]. These where:

- to create an understanding between human and nature
- to create reflection and attitude towards nature in order to increase the visitor's will to take action
- to create fascination and joy of nature and thereby increase the incentive to discover and protect the nature
- to create an exciting and engaging learning experience whereby the individual can acquire scientific experiences and knowledge

As a result we had to define the trade-offs between the various design choices. To keep the aesthetical aspect, we decided not to take up a large amount of space and instead use small installations made of organic material which goes well with the trees and plants. The concept is made primarily from this thought, to keep it simple and not disturb the overall picture. It can be discussed whether the application and therefore also the use of a mobile device will

disturb this picture. By looking and interacting through a screen the direct interaction with the nature does not exist. Although, to pass on information about DNA, and how biologists use it to identify plants, some kind of technology had to be included. Another reason for using a mobile device for interaction was that it is already owned and used widely by our targeted audience. This would make an easy transition from the otherwise great gap between the scientific knowledge of the children and the scientific level of DNA-analysis. This also led us to reflect on the learning aspect and that it had to fit the targeted audience consisting of families with children. If we made it too difficult to understand the process of using DNA, the visitors would perhaps not make use of the concept. The scientific level is therefore adjusted, compromising the actual process of extracting a DNA-string and analyse it in a lab. Instead we use certain combinations of plant attributes connected with certain colors on the barcode making it more logical and easier to comprehend for children.

Another concern were what kind of experience to aim for and why the visitors should use the application. Beside learning about DNA and the various plants, we discussed why and how it could be fun for children to use the application. Furthermore we wanted to draw their attention to the tropical space and away from their main interests, such as computer and soccer. With the first idea, we tried to involve competition and social elements which should motivate the visitors to play the game. Reflecting on this design choice, made us realize that the competition would take the attention away from the plants itself, because of the urge to win, which did not apply to the overall goal. Instead, we discussed how to combine the experience with something that actually had something to do with the man-nature relationship and still be exciting and engaging; *doing more with what we got*. Two ideas arose, one where the visitors could take a seed with them home and nurse it so it would grow. This would make the visitor feel a connection to the nature, even after he had visited the botanic garden. Another idea, which is the one we chose to use on our final concept, was to take advantage of the concept already at hand. Exploiting the actual experience of being a biologist. To enhance this experience, we added a small screen next to the plant for example saying that “Banana tree - discovered by Tristan”.

To contribute to the existing architecture and arrangement of trees and plants, and in this section, especially how we enhance the properties of exploration and learning, we chose to use situated interaction.

“Contexts remind people and their devices how to behave... architecture has been a form of etiquette. Like most etiquette, architecture exists not out of pomposness, but because it lets life proceed more easily.” [McCullough, 2004] p. 118

To support the exploration and learning that the tropical space exhibits, we chose to leave out the map of where the magnifying station would be shown. By doing this, the visitors would not only look for these spots, but explore the room more freely. We also discussed whether a time-limit would cause more involvement and exploration, but we did not believe that the trade-off between these two and exploration and learning would be justified by implementing such a dimension. Firstly, because it would impair the choice of free exploration since the visitors focus would now be on completing the identification of the plants as fast as possible. Secondly, because the engagement and motivation would be on the time aspect, instead of the learning about plants.

The use of design stories[Parrish, 2006] provided, and enlightened different design features, and it also helped us to explore different episodes of use with different users. Also, as Parrish states, it helped us to communicate the values of our design to the clients - in this case Kamma and Karen.

Conclusion

In our process of making a concept for the Tropical space at The Botanical Garden, we have been through several iterations before reaching our final concept. The feedback, the literature and the requirements from The Botanical Garden itself have influenced the overall design. The primary objective was to recognize the needs, but still be able to use our own design skills in the process.

We ended up with a smartphone application which is most suitable for families and their children. Although It can still be used by other visitors as a playful and engaging way to explore the tropical space. In addition, the information visitors are getting with the DNA game teach them about the technology used today and gives an example on how nature, humans and science interplay with each other. Furthermore, the application gives the visitor an incentive to explore the space more thoroughly, whereby they encounter a more aesthetical experience due to the denser vegetation in the narrower paths- one of the wishes made by Kamma and Karen from The Botanical Garden.

Although we hope that the concept in the future would be used by all visitors, we are aware of those not familiar with technology and those that want to explore the space on their own. Therefore the concept does not disturb the aesthetical experience for these people. It allows visitors to get the experience of the space without having the need to use technologies, which could be unappreciated by users that want a sensual and technology- free experience of nature.

Visitors can be enticed to use the application throughout the room by finding the magnifying stations which can trigger their curiosity and get them to engage with the stations. Both with

the application or just with their camera. This also broadens the field of visitors that would be motivated for using the stations to investigate and engage with the plants.

The concept we ended up with fulfills our goals by letting people explore the space by leading them on a small adventure in the plant world and gives them the tools to investigate with more knowledge and in a detail oriented manner.

References

- Bek, L. 1997, 'Arkitektur som rum og ramme – en analysemodel'. In Bek, L. & Oxvig, H. (Eds.), Rumanalyser, pp. 24-28.
- Dindler, C, Iversen, OS & Krogh, PG 2011, 'Engagement through Mixed Modalities' Interactions (New York), vol 18, no. 4, pp. 34-39.
- Kamma endeligt oplæg til datalogistuderende, 2013.
- Parrish, Patrick 2006, 'Design as storytelling'. TechTrends, August 2006, vol 50, no. 4, pp. 72-82.
- Presentation Link - <http://www.presentation-link.com>, 2013.

McCullough, Malcolm 2004. 'Digital Ground: Architecture, Pervasive Computing, and Environmental Knowing' MIT Press, pp. 117-191.

Appendix

1A. Space Analysis

As a part of our paper we will use Lise Bek's model to analyze the tropical room in Botanical Garden. Bek argues that the first hand impression of a space is created by the different senses. These experiences are often based on what you see, but also other senses such as hearing, smelling and the cognitive sense. In addition, Bek presents five aspects, which she uses to describe how a place is perceived. Furthermore Bek elaborates that these 5 aspects together creates a sequence of transitions without being irreversible. The five aspects are as follows:

Context

The space that will be analysed in the following is called the tropic room (see figure 6) and is an area within the greenhouses in The Botanical Garden in Aarhus. The space consists of different areas that are all connected through a large path with smaller paths interconnecting the main one. The space offers the audience with the opportunity to explore and see different sorts of plants in a tropical climate, which represents plants from both Asia and Africa. There is also a tower from where the audience can get an overview of the entire area.

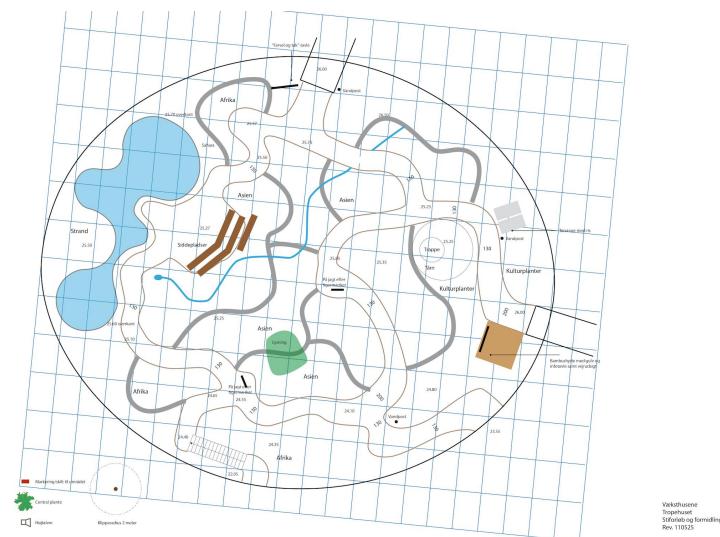


Figure 6: Overview of the Tropical Room.

The form aspect

The space is enclosed by a big dome that works as a greenhouse. The dome is almost transparent so most of the light in the greenhouse is natural. It is a circular space with

symmetry because of the paths that leads you around in a circle in the tropic area. There is two levels of the space; on the ground and in the tower. The tower is made of mostly natural materials and therefore feels like a natural part of the space. When you stand on the top of the tower you have an overview of the entire space, the treetops, some of the paths and the small pond in the back (see figure 7). When you are back on the ground it is only possible to see what's in front of you, because of the dense vegetation. By following the different paths in the tropic area it is possible to see all of the trees, bushes, plants, etc. There is both big and small paths wherest the smaller paths leads you into the middle of the space, this is where you are closest to the plants and therefore more connected with them. In the small pond in the back you can find fish and lotus flowers. The water where they live is parted from the woods by one of the big paths and is also illuminated by ekstra lamps and not only the natural light. The heat in the space and the butterflies that just flies around connects the space which makes it feel natural that this tropical area is living under a dome.



Figure 7: Picture of the pond

The practical functional aspect

The main functional aspect of this room is to let the visitors see the different plants in this type of climate, this is both done with a practical aspect but also with an aspect that leads to exploration. The room is divided into minor different areas which are all connected through a path system, which uses a large main path and smaller sidepaths to connect the different areas (see figure 6). These smaller paths lets the audience decide whether or not they want to explore the entire space as it is, or they only want to follow the main path. This could be either positive or negative, by which all of the important things that the audience needs to see are placed by the main path. Lastly, one of the first things you will see when entering the room is a tower, which you can walk up in and provides you with an overview of the room

(see figure 8). The size of the tower lets about 20 people be up there at the same time, which clearly should be taken into account when designing for this area.



Figure 8: View from the entrance of the room with the tower in the back

The scenographic-social aspect

The space is a public space where people can come and go in opening hours. The space offers different forms of usage by which type of visitor you are. You can come and enjoy the different types of climates and explore their respective plants. You can also come and explore each of the different plants closer if that is of your interest. There are many possibilities because the scene invites to an open form of exploration. All of the elements that are placed within space are designed with its context in mind. The style and choice of material for the different elements are all kept within the frames for this type of climate and location.

The iconographic-semantic aspect

The architecture does not seem to build upon a higher religious, philosophical or ideological idea. Instead the architectural decisions have been made accordingly to fit the survival of the plants and trees within the room. These decisions include a dome of inflatable “windows” that both allow for a high rate of light to come in and the possibility to adjust the temperature so the plants and trees can grow in both the summer and the winter.

The arrangement of the trees and plants within the room is divided into regional zones and does not reveal any kind of iconographic ideals as well. The only iconographic item, although we believe it is not intentional, is the pond which can be referred to the Japanese lifestyle of Zen Buddhism.

The visual-experiential and aesthetic aspect

The intention behind the room is to pass information about the trees and the plants to the visitors. Furthermore, the arrangement let them explore the environment where each of these plants would grow if it lived in the “real” nature like the dessert or in our case, the tropics. They do this by letting the visitors explore the space on their own through narrow and intimate paths(see figure 9). The Trees and plants surround them so they most of the time can't see the concrete walls and the inflatable windows. This combined with the temperature, humidity and butterflies creates an almost life-like environment.

When a visitor enters the space, she is met by a high tower created from organic materials and butterflies flying around. From the top of the tower, one can get an overview of the space and feel how it would be if they were Tarzan.

It is still difficult to make any conclusions about how the planners' aesthetical and visual ideas would work in real life since the tropical space is still under restoration. Although, the architectural decisions that already has been made is well on the way to create such an experience.



Figure 9: The main path

2. Storytelling

2A. Young boy accompanied by his family, that downloads the application

“Tristan a young boy at the age of 11. Currently he is in school, and is attending 5th grade. His interests is football and computer, which he spends most of his time with. Tristan's parents has taken him to The Greenhouses in The Botanical Garden, although he does not find plants very interesting. He believes and feel that it is a waste of his time, and would much rather just play computer. When the family arrives at The Greenhouses and steps into the Tropical room, Tristan is prompt on his mobile phone about an application, where he can help The Botanical Garden with identifying names on some unidentified plants. He gets

excited and thinks that sounds like a lot of fun. Further he tells his dad about the app he has just downloaded. After that the family starts their tour by looking walking down the main path in the space, meantime Tristan is scouting for plants which has not got a name on them. Suddenly he sees a mobile phone rack in one of the small sidepaths, which was described in the app as a magnifying station. He tells the rest of the family about what he saw, and rushes over to it. After a quick look, he places his mobile phone in the station. Then the app tells him that it is trying to analyse the DNA of the plant. He asks his dad what DNA is and now his dad interest is awaken, and he tells him it is something like a fingerprint which is unique. Tristan tries to move the flexible magnifying station closer and tries to look at the plant in different angles. When DNA loading process has reached 100 %, Tristan is now asked about some of the characteristics about the plants so it is easier for him find its DNA match. He answers that it has thorns, and sees that some of DNA barcodes disappears. And for more looking at the other DNA codes, he finds the right one. He sees that i was a Lotus Flower and gets a short description and some fun facts about it. At the end the app thanks him for his help, and Tristan can see that the information display at the plant now has a name on it. Further it tells him that there is more unidentified plants in the space, and it would be of great help if he could identify them as well. He thinks that this was very exciting, and that the Lotusflower is a pretty cool plant. Now he can't wait to find more unidentified plants. When return back to the main path, his father thinks that it was very good, that his son, had downloaded the app, because else they may never have seen this beautiful flower on the small sidepath.”

2B. Man who does not want to download the application

“Hans is a man in the late fifties. He is working as a locksmith, where he often get called out on night time jobs, where people have locked themselves out from their home. He really loves music and the outdoor life. Today he has decided to visit The Botanical Garden greenhouses, and is especially looking forward to see the tropical room. When he enters the room, he is being prompted on his mobile phone, that there is an application available, where he can help the greenhouse identify some unnamed plants. He thinks that is weird and would rather just enjoy the different plant on his own terms. By that he chooses not download the application and proceeds his tour without it.”

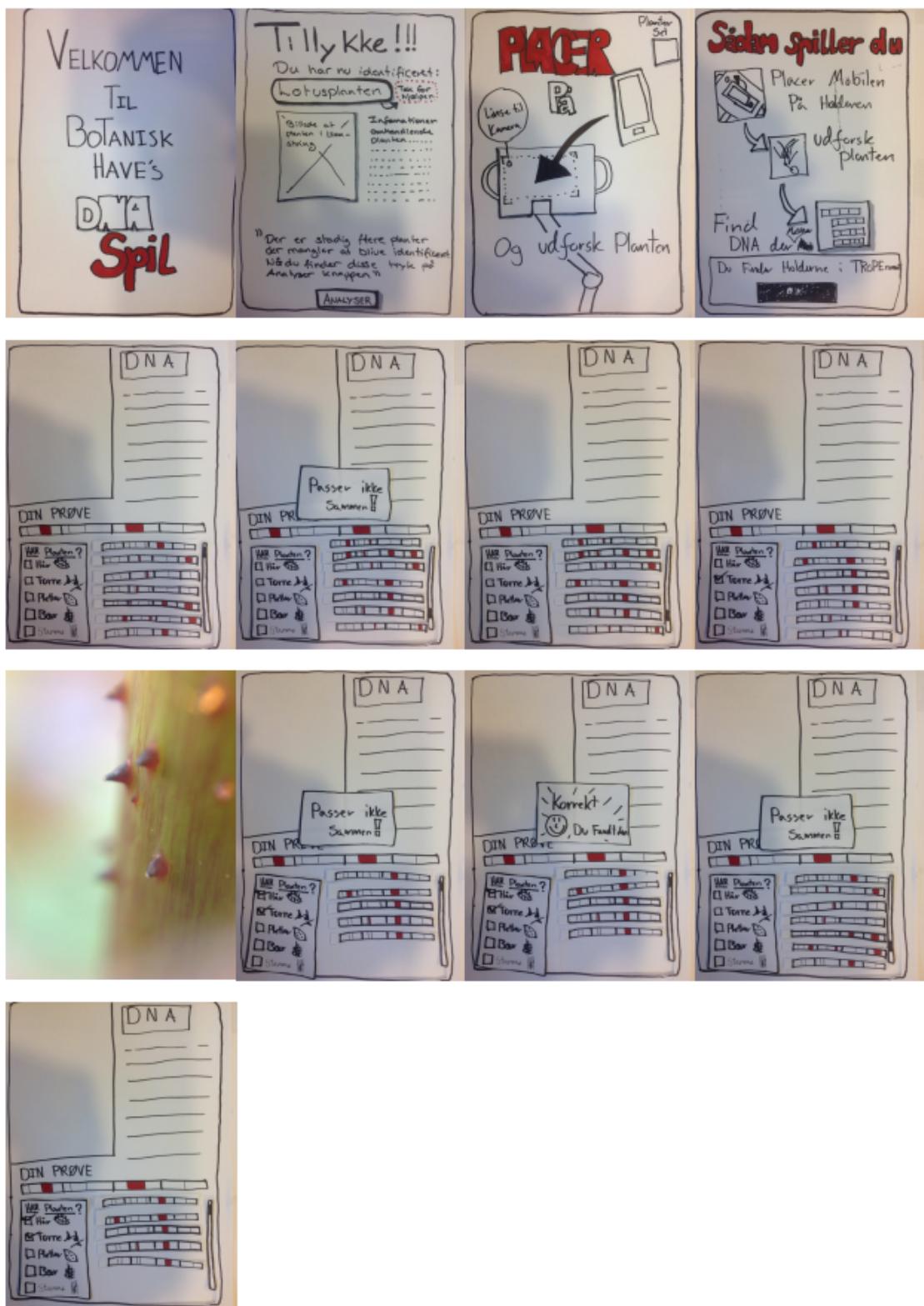
2C. Woman who downloads the application, when she sees the need for it

“Spencer is a clerk at a convenience store, and has worked there almost a year. She is constantly on her mobile phone, using various social medias and playing games. When she arrives at the Tropical Room in the Greenhouses, she is prompt to download an application where she can help with identifying names on unnamed plants. She gets a little curious, but

also thinks that it sounds a little strange, so she decides not to download it and proceeds down a main path. When she is about to follow the path around a corner, she sees a little sidepath, but ignores it at first. After a second thought she noticed a rack in front of a plant. She chooses to investigate the little path further, and sees that it is possible to place her mobile phone on the rack. Then Spencer remembers the application she was prompt to download, and concludes that the rack must have something to do with the app. After ten seconds she has downloaded the app, read the description and placed her phone in the rack. She now starts analysing the plant and after a short while she has its DNA. When she has identified it with, she reads the short description of the plant and thinks that she definitely will remember this one. She then proceeds back to the main path, and decides that she have to explore all of the small side paths in the greenhouse.”

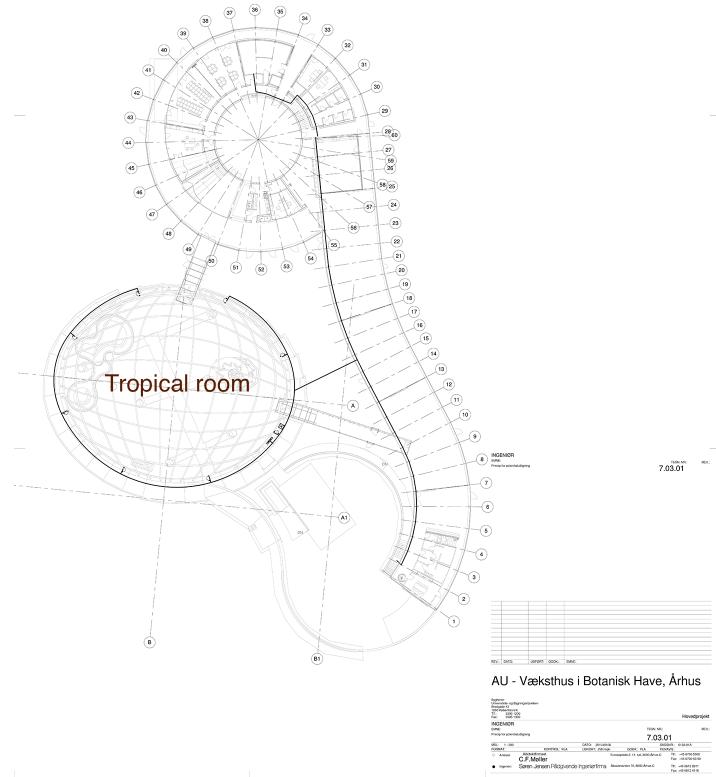
3. Low fidelity prototype

3A. Screenshots



4. Pictures

4A. Overview of the Greenhouses at The Botanical Garden



4B. Overview of the Tropical Room

