

D  edel

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B 1.2

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Can you imagine children racing their go cart in the corridors of a hospital? Or painting on the walls? This is exactly what the KiKa or Princess Maxima Centre for children with cancer wants them to do. The KiKa will not be a normal hospital. It has the ambition to become an iconic hospital to the world. A hospital in which children can play, learn and explore as they would do when they would have a normal, healthy life.

In this report you will find the process and outcome of design project 'Doedel' in the project 'KiKa Play'. KiKa Play concerns the assignment to come up with an interactive piece of playing equipment for children with cancer. The KiKa Play project is an initiative of the Princes Maxima Centre in Utrecht and the faculty of Industrial Design at the University of Technology in Eindhoven, the Netherlands.



Introduction

'Doedel' is a Bachelor 1.2 project by the students Jelle Worries, Emma van Zoelen en Niels Weggeman, and consists of a combination of an interactive wall projection of a theme world and a teleportation machine (or scanner). These devices are to be put in a configuration in the to be build hospital in Utrecht, where children can scan drawings of theirs and shortly after see them come to life in the big, projected Doedel World. Here, they can interact with their drawings as if they were real animals, plants and other items through touch, sound and movement.

Doedel





Roles in the Project



Niels, Jelle and Emma at the Final Demo Day stand

Emma: My main focus in the project was on the User Focus and Perspective. While designing, I constantly tried to make sure the concept fit our target group. In the beginning this was by keeping brainstorming and idea generation very focused on the aim of the project. Towards the end this was by creating plans for user testing, eventually carrying out a user test and constantly defining and redefining the concept. Connected to this, I gained experience in Ideas and Concepts, in elaborating on the concept while looking for the core and the main strength of our work.

Niels: For this semester, my plan was to focus mainly on Socio Cultural Awareness, User Focus and Perspective and Form and Senses. I wanted to be sure that our concept would actually be of use for the children in the KiKa hospital, which was done in the first quartile majorly by iterating between envisioning what we wanted to give the children and developing concepts. Related to this was some later work that I did on visualising the concept for the Midterm Demo Day. In the second quartile, quite early already we started preparing for the Final Demo Day after we had redefined our concept. My focus in the preparation was mainly on developing the software for the final presentation.

Jelle: During this project, I wanted to focus on Socio Cultural Awareness (SCA) and Form and Senses (FS), because these were the main competencies that I had to (and could) develop within the project. In the Kika Project, it was hard not to develop SCA, because you are designing for children with certain physical and mental impairments. Although the coaches told us not to consider the disease too much in the design process, I found myself constantly thinking of whether children would be able (mostly physically) to carry out certain tasks implemented in the concept. For FS, I did the designing of the concept before the midterm demo days and after that I designed the scanner and the drawing templates for the final concept (which will be explained later on).

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Research





Hospital Visit

On the 22nd of April, a group of about twenty students was allowed to visit Wilhelmina Kinderziekenhuis, to look into hospital environments for children. Unfortunately we were not able to visit children in their rooms and no arrangements were made to talk to the children. We did get to see a big part of the public rooms in the hospital though, including the big entrance hall, the garden connected to this, the Ronald McDonald livingroom, the playground, some playrooms and the waiting rooms. Also, two women from VOKK (Vereniging Ouders, Kinderen en Kanker) were present to give us some more information about the children, their illness and the aims of the new Center.

VOKK

This association works together very close with the designers of the Prinses Máxima Center. Their main focus is on development-oriented care. This means mostly that every aspect in the new Center should be designed with the regular development of the children in mind. It also means though that not only the child is important, but also the parents and other family members. The aim is to let the family live as if they are at home as much as possible and to give them quite some autonomy in the organisation of their daily life.

Challenge

Designing for play and development-oriented care in a hospital has several challenges and opportunities. One of the main goals of our designs should be to get the children out of their beds and their rooms, into the hallways and public rooms and to make them move. At the moment, many children just stay in their rooms even though they are actually able to move a lot more, because there is not a lot to do in the hospital. This way, they do not encounter other children with whom they can play and share their feelings.

Extra Information

There are some difficulties in the design challenge. For example, the age of the children staying in the hospital will range from about 2 to 18. It would be nice to have specific designs for all the different age groups, for example at different heights. Personalizable rooms, for example with projection, might be an option to make the rooms suitable for different age groups.

Furthermore, it might be nice for the children to use creativity as a way to cope with their emotions.

Some aspects to keep in mind are the fact that children are not always in the hospital for a very long time. Very often, they return regularly and go home again. Also, the worst thing for the children is mainly that they are afraid to miss aspects from their normal life, like school and playing with friends.



Hospital Environment

What struck us most in the hospital, was that the overall environment was quite sober and old. The whole ambiance was really that of a hospital, not very pleasant, and there were almost no children playing in the designated areas or in the hallways. The entrance and the Ronald McDonald livingroom were the liveliest parts, as they looked less like a hospital environment and there were more children playing around there.

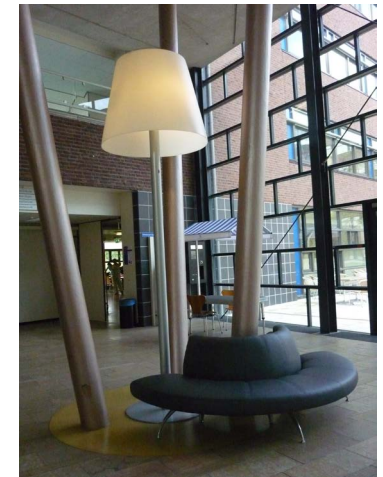
The sober ambiance and few children playing around in the hospital motivated us even more to come up with a concept that would really get the children out of their rooms. We wanted to create something that would emphasize the imagination and playfulness of children and that would really make them enjoy the hospital visit just a bit more.



The scary monster in the sober and sad garden



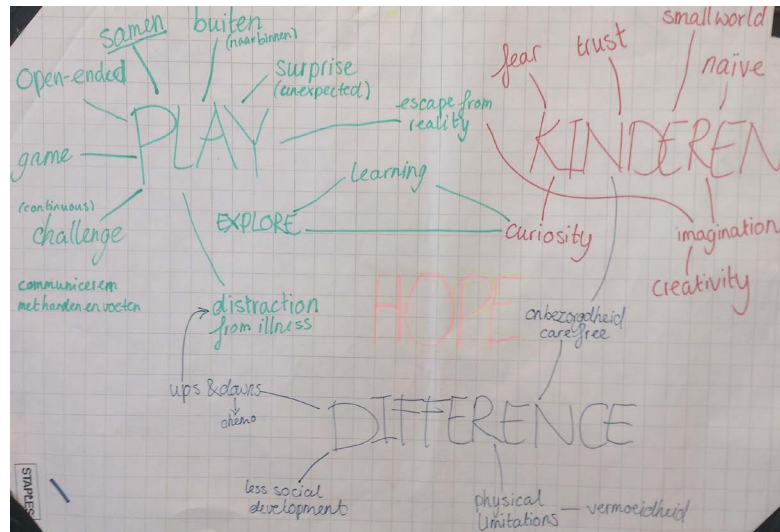
The Ronald McDonald livingroom, the entrance and a hallway



Design Process



In the first pressure cooker, we started out with an envisioning brainstorm, to find out what our ideas were on the project and to get a direction to start designing from.



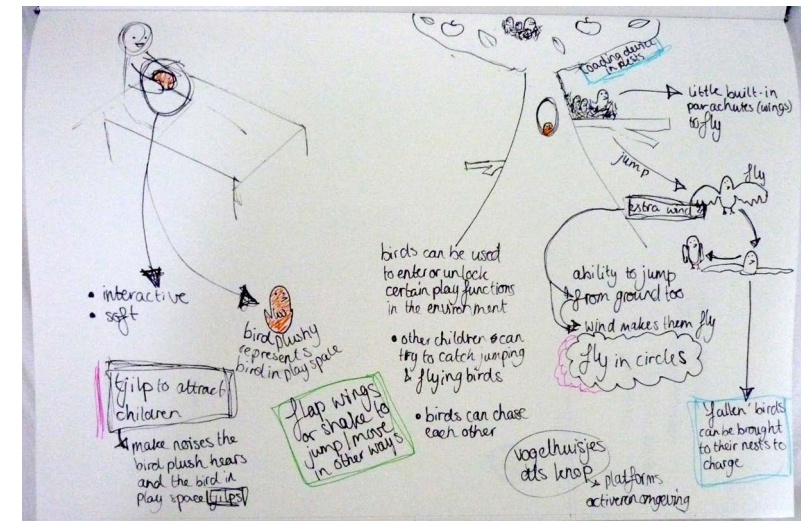
Mindmap first brainstorm

The brainstorm focused on play, children and the difference between healthy children and children with cancer. Afterwards, we decided to design for the children that are not able to get out of bed due to their illness, with the focus on social interaction with children that are, also inspired by the 3D impression in which a child says: “When I feel good enough, I can play with other children.” Since we knew from the building plans that every personal room would border a public garden, we came up with the idea of letting a child in his or her room influence the space outside, where other children are playing.

That way, the child inside would be able to play with the other children and would have a certain power or special role in relation to the play, making it less a punishment to play from the bed.

First, we wanted to do this in the shape of a device with which a child could literally manipulate the playground by for example creating hills, and letting soft balls fall out of trees. To concretize these ideas into a concept, we did an individual brainstorm and sketching session.

We decided to continue with the concept of a distance controllable pet, that would be a sort of avatar for the child in bed. This avatar would go out in the public garden to play with the other children.



Individual brainstorm Emma: the start of Ami





The final design would consist of a controller that could be turned to let the animal move and a little kind of bird. The bird could walk (roll) and jump a little, after which it's wings would make it hover as if it were flying. We called the animal Ami, from the Spanish word amigo, meaning friend.



Ami (design of the bird)

Several aspects of feedback were mentioned.

- We might add a camera in Ami, to make the children look through Ami's eyes. That way, the child in bed will see the world from a different perspective and might see more and other things than the rest of the children.
- Another suggestion was to make interaction between Ami's possible by creating a system around it.
- It would be nice to use them as a sort of communication device.
- The children might want to touch their Ami, therefore there should be a possibility to take it inside.
- If children could personalize their Ami, it would really become their pet or avatar.
- Children might want to take their Ami home to keep in touch with friends from the hospital and as a memory.

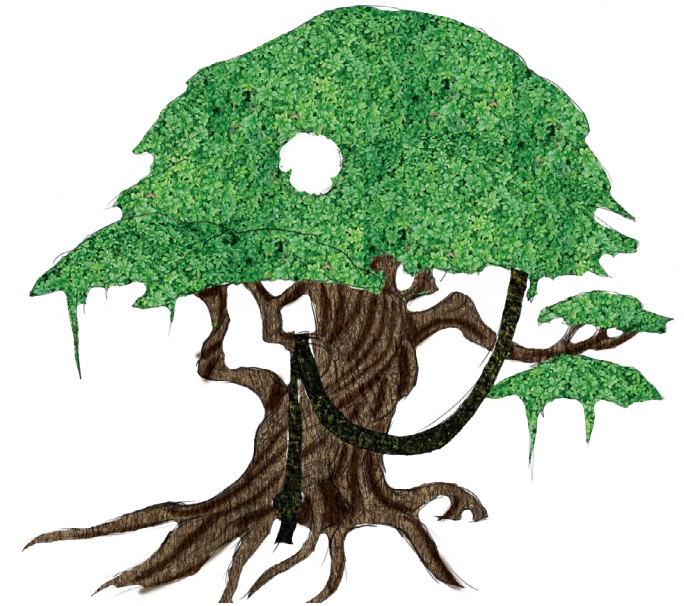
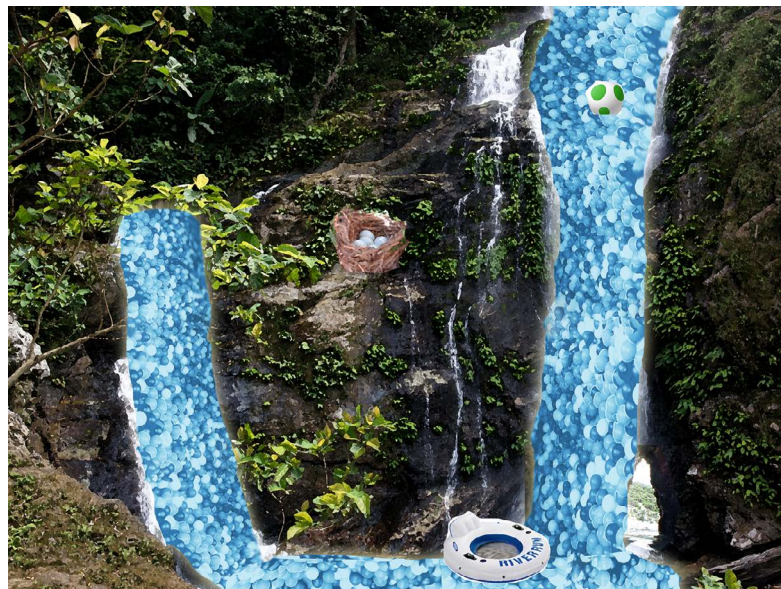
Eventually we decided not to continue with Ami, as it did not fit the aim of new Center; getting the children out of bed. Also, making a controllable pet with enough freedom for play from a bed was not very feasible.



*Design of the controller.
This was inspired by the traditional wooden control of a marionette.
The idea was that it could be tilted to move Ami.*

Jungle Interactive Playground

For the second pressure cooker, we decided to take on another idea we had already earlier on in the process during the first pressure cooker, to find out whether that was a better match with our vision; an interactive and theme based playing environment for the hospital. After an individual brainstorm session we had a refreshing collection of new ideas and concepts that could all be placed in the public rooms in the hospital, where the children can play together. We could create an immense immersive fantasy world with jungles, caverns, castles and pirates, and the hospital would be a portal to this world. We could give the children the chance to discover a world, a possibility they had lost as soon as they moved into the hospital.



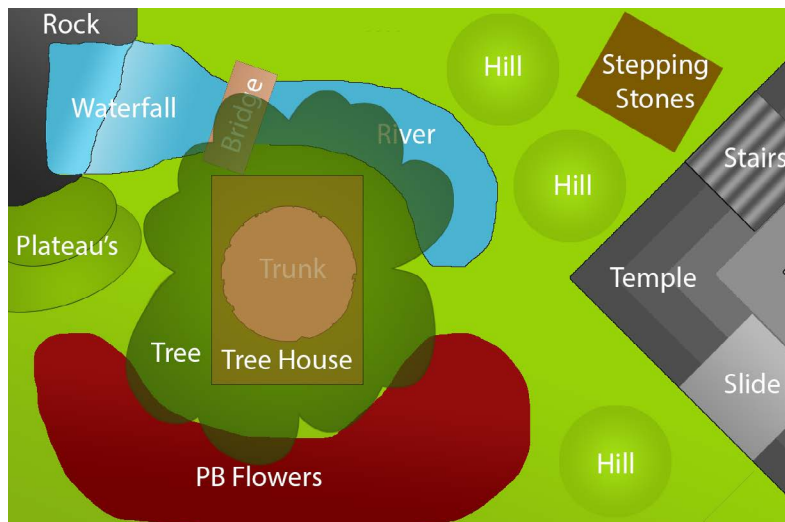
Several objects in the playground that we designed. A waterfall made of balls, a climbing tree with a treehouse, a flower that reacts when you come near and a mysterious temple that you can only enter by solving a puzzle.



As you can see from the pictures on the previous page, we designed a jungle interpretation for one of the patios. This jungle was full of interactive playground equipment, including but not limited to a softball waterfall and river, secret caverns, large trees with tree house, a temple and many other interactive objects. A major advantage of this concept, we found, was the very fact that it would all still be physical, and not digital. Though digitalization could add a very interesting layer to the experience, we didn't think it constructive for the real life social interaction between children.

At the end of this second pressure cooker we had to describe our concepts in a presentation (given by Emma, pitch in appendix C). We had made a visualisation of the different playground equipment that could be developed further, focussed on handing the children a world for themselves, a place to come to rest and be child.

After the presentation, many people liked that we had focused on the physical world. People wondered whether there would also be a physical portal that would teleportate children to the magical fantasy world, as they thought that would really add to the experience.

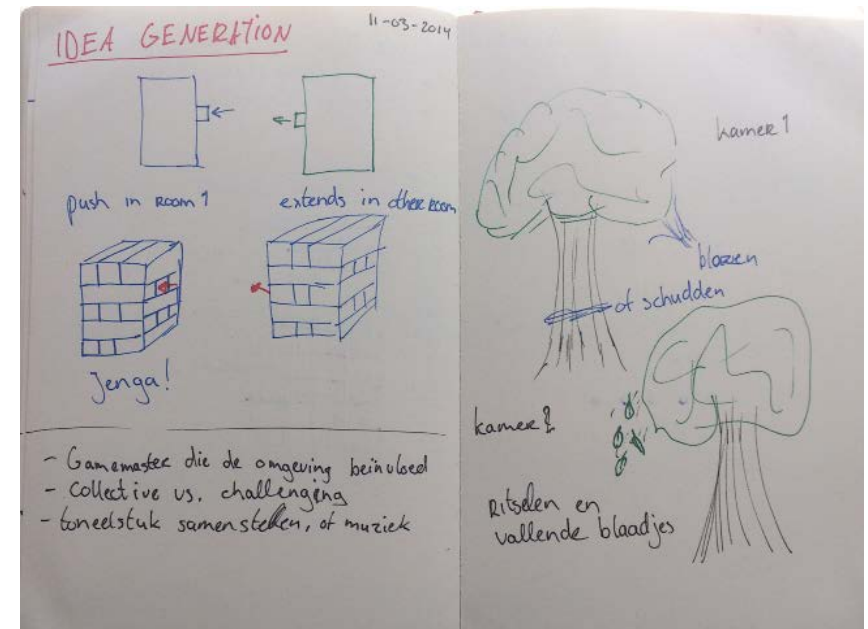


The placement of the interactive objects in a patio



Aranya

After the second pressure cooker, we got the feedback that people really liked the idea of having a portal that leads into a new, fantasy world, like JIP, but that we had to focus on one aspect of the whole playground, and that it would be too extensive and expensive to make JIP reality. After the feedback session, Cees Henzen, the official from the Prinses Maxima Centrum that visited the presentations, gave a presentation on the vision of the hospital. The main point was that children should be triggered to leave their rooms and play with others, because they believe that leaving their bed and having fun increases their chance of overcoming their disease, and speeds up the process. We continued to brainstorm for new ideas with this in mind.



Brainstorm after JIP

Soon, we came up with the concept of having an object in every common room (or patio, as they are called in the building plans), where the children could do things together. We envisioned this to be a pillar shaped object in the middle of the patio that would function as a kind of quizmaster. This pillar could give children the opportunity to do things together, like making music. The pillar would ask individual children to make the sound of a drum kit, another child to make the sound of a guitar etc.

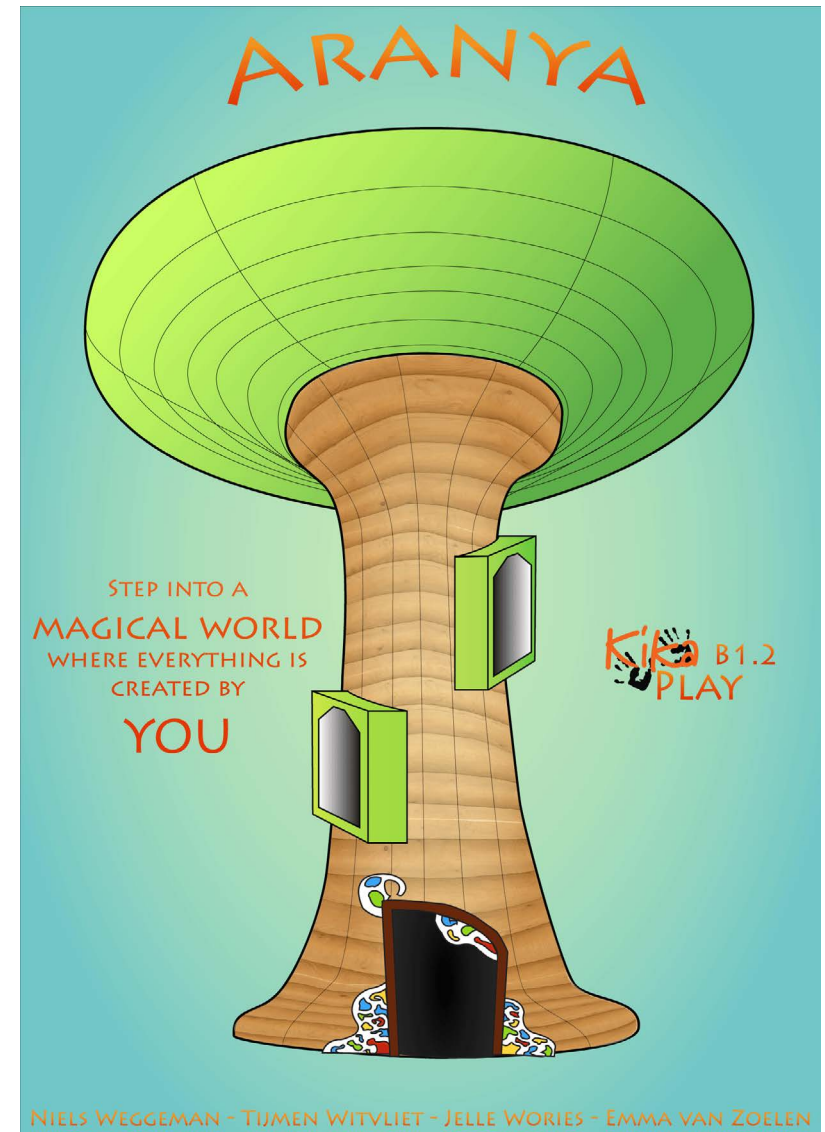
The pillar would then combine all sounds into a song. Another example we thought of was children acting for a play together. The children from one patio could enact a scene, and the children from another patio would do a different scene, which the pillars would then combine into a play. These plays, or songs could be displayed in the lobby downstairs and in the rooms of the children, so the children who couldn't participate could still enjoy the work of others.



Because of some uncertainties in the building plans (appendix D) as to what were spaces we could design for, eventually we stepped off the idea of having a unit in every common room. Instead, we would have one room in which there would be a single device where the children could cooperate to achieve things. We came up with the idea of having a closed environment where children could draw anything they wanted, then stick the drawing on the wall and the drawing would start moving along the walls.

A lot of people were very enthusiastic about the physical portal in the concept of JIP, so we decided to add that to the concept as well. We wanted to have one big central space in which there would be quite a big tree in which the children could walk up (inside the tree) to a dome in which they could draw and bring their drawings to life.

During the midterm demo day, people were all distracted by the formgiving of the tree instead of the actual concept, which was making drawings come to life. Everyone was sharing their ideas about how they didn't think it was feasible to put a giant tree in the hospital.



Poster Midterm Demo Day



Cross section of Aranya



Team-Lab's aquarium concept

This feedback was a real eye-opener to us, as the tree indeed didn't add anything but extra costs to the concept. Therefore, we redesigned the concept of an interactive animation world containing children's drawings to fit somewhere in the hospital. Indoors, this time. This would allow us to focus more on designing the interaction, rather than on the overall formgiving.

Up until now, we had had the idea of somehow being able to directly transfer a drawing from paper to screen, by putting the paper against the wall. During our trip to the Milano Design Week, however, we discovered a very similar version of our concept had been made by the Japanese company Team-Lab, which was very limited in interaction however. Their research product made use of a physical scanner for this transition instead, which inspired us a lot. On return in Eindhoven, we decided that we would do something likewise instead of trying to achieve direct digitalisation; this would make the entire concept a lot more realistic and would make the entire experience more active and thus more exciting.

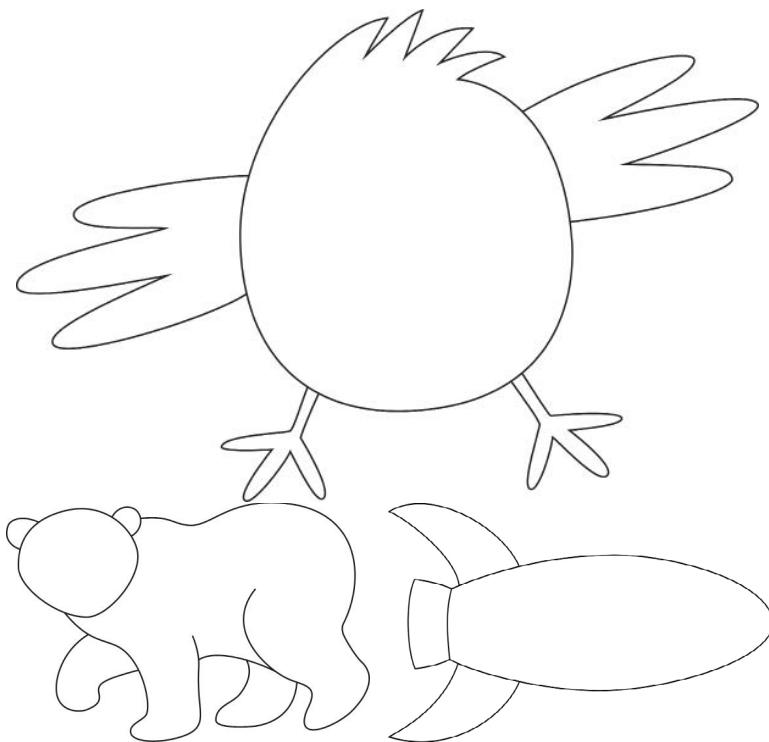
Final Concept





Vision

When children move into a hospital, they suddenly have to live within a closed environment. The opportunity to explore the world around them and learn about everything is gone. Therefore, we want to create something which in some way provides them this opportunity, this possibility to explore and enjoy their environment, as children love to do.



Drawing Templates

Concept

We aim our product at children in the age of 6 to 9. In this age, children are in general able to draw recognizable things and still have a wild imagination, an imagination we want to stimulate, to make the hospital experience more pleasant.

We want children to come out of their rooms and play together. We have learned from own experience that children can have fun with very little resources; with their imagination, they can make anything come to life. Our concept is that we provide the resources to stimulate the children's' imagination and make the stories they come up with even more extraordinary.

Draw...

Children will be able to make their drawings quite literally "come to life". In the common rooms, there will be a table on which children can find an extensive range of drawing templates (in future, we would like the child to be able to draw without the templates as well), which ranges from astronauts, cars, birds, rockets, bears, planets, you name it. The children can colour these drawings in any way they like, and put it in the teleportation device. When they close the door of this machine, lights will start flashing and it will start to rumble!

...and make it come to life!

When the machine has cooled down, the drawing will appear on a big projection on the wall. If the child has coloured in a bird, it will start flapping it's wings and flying across the screen. If the child has drawn a rocket, it will launch off with a lot of fire and smoke and start soaring across the wall. Monkeys will start throwing bananas at each other and if they're a little cheeky, they might throw a banana at the children!

When the drawing has come to life, it isn't over yet, this is where the actual story begins! Children will now be able to interact with the drawings. Bears will start bothering beehives for honey, and when the child taps on the beehive, the bear will get chased by bees! When a child holds his or her arm in front of the screen, birds will come and sit on it! If you shake the tree by touching it multiple times, the apes and birds will fall out of the tree! If you swipe the rockets in the direction of a planet it will land there, and if the child has drawn an astronaut (or maybe a bunny in a space suit?) it will get out of the rocket and plant a flag on the planet!

The possibilities are endless, and because it is very easy to add a template, we can ask the children what they are missing and add a new template within no time.

Share and trigger others

The projections on the wall will also be recorded and sent out to all rooms so the children who are stuck to their beds can watch the silliness of others on their tv. Seeing this will hopefully trigger them to wanting to leave their beds and looking forward to being able to join the others. As said by Prinses Maxima Centrum official Cees Henzen; they believe that it helps children in recovering from their disease more quickly if they leave their beds and play with others. We also want to send out the recordings to a screen in the downstairs lobby or at the reception, so parents and children can see what the children are doing upstairs.

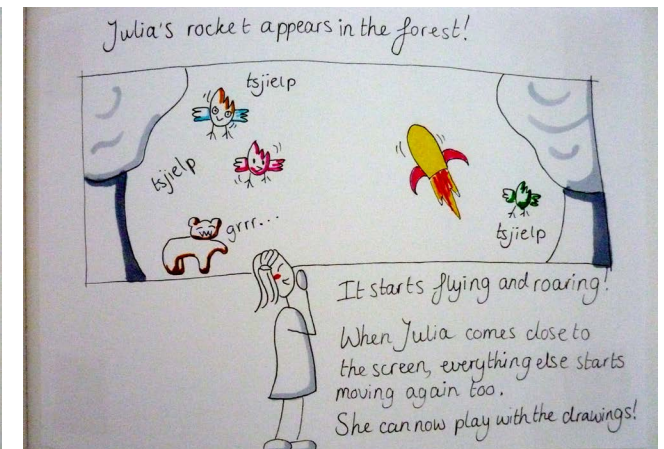
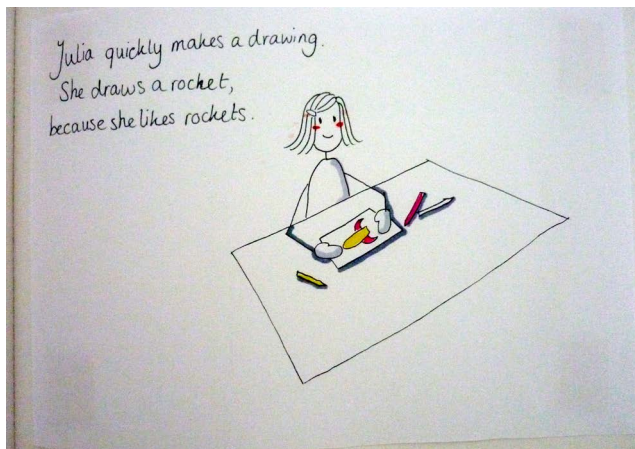
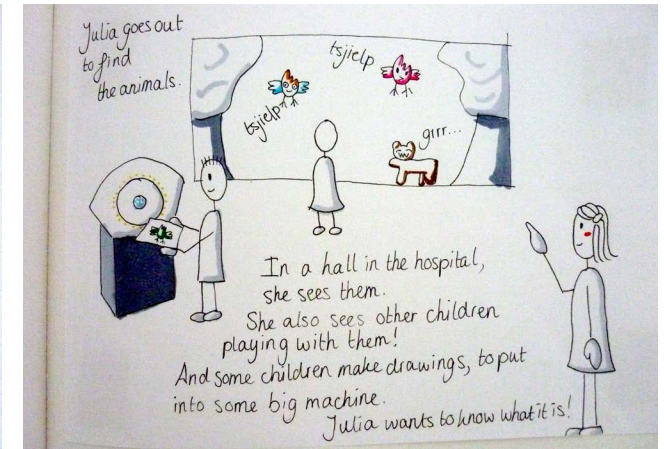
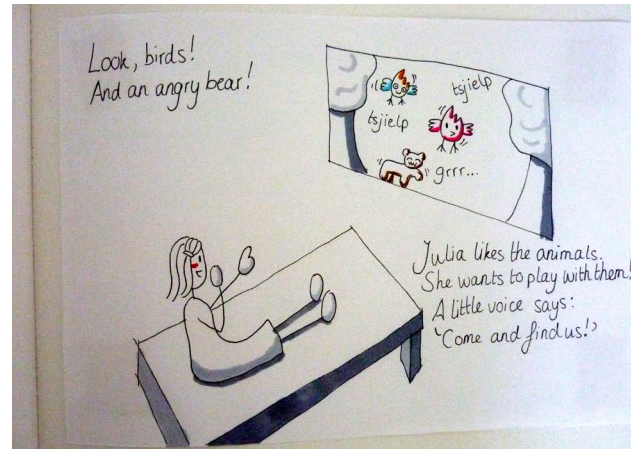
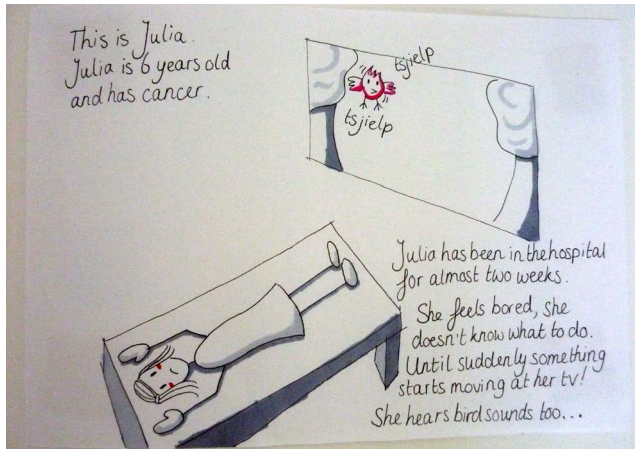


Setting in hospital



Storyboard

Final Concept



A girl, Julia, gets attracted by the moving drawings on her tv screen. As she goes to look for them, she finds the projection and the magic teleportation machine. She quickly draws something herself and makes it appear on the screen to play with it.



The Magic Teleportation Device

Since the 'Magic Teleportation Machine' will be the interface with the children can insert their drawings, we decided to do a brainstorm session about it's shape.

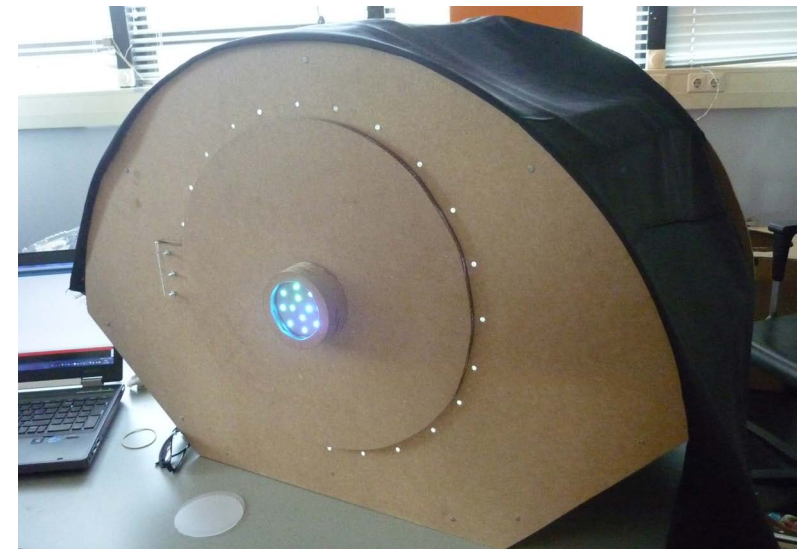
After a lot of regular brainstorming, sitting together and talking, and not getting any results from it, our coach gave us some advice on a different brainstorming technique. He told us to get cardboard and start making prototypes with it. Within half an hour, we had three completely different designs.

Jelle's idea was to have a kind of vault where the children could put in their drawings. Emma had a futuristic design for an actual scanner, and Niels had the idea having the children put their drawings in a book which would scan the drawing when folded shut.



We decided to combine all three designs. The original idea was a vault in the shape of Emma's scanner, where children would put in a book with their drawing in it. When making the actual scanner though, we began to realize that having the book was only another technological hurdle that did not contribute to the concept that much, it would make things more complicated than they needed to be.

We decided to make it quite big with flashing lights. That way, it would be something impressive and it would become a significant action for the children to go to the machine and put their drawings in.



A cardboard exploration and the final scanner design



User Test

Plan

Since the beginning of our project, one of our main goals had been to test parts of our concept with real users, as we thought this would highly increase the quality of our concept. There were a few important points we wanted to get out of the test:

- What level of definition the children prefer in the drawing templates
- Whether the children prefer to use templates or their own drawings
- The level of enthusiasm for creating drawings that come to life
- The amount of story the children like to create
- Specific interactions with the drawings that the children prefer

In order to get information on the above aspects of our concept, we came up with a creative exercise for a group of eight children, who were divided into two groups of four. Both groups received white A4-paper, markers, pencils, scissors and drinking straws. Also, several drawing templates were provided (Appendix A). These templates were chosen within a forest theme, with different levels of definition.

The assignment the children were given was to create a story with drawings. Every group had to use at least two drawing templates. For the rest they could decide for themselves how many templates and original drawings they wanted to use. After they had drawn and made up their story, they had to cut out their drawings and stick them to the drinking straws. They then had to perform their story in front of a forest-themed background to us and the other group.

School

To be able to carry out our user tests, we decided to approach a primary school. The school with which we were able to make an appointment is BS Drents Dorp, positioned in the west of Eindhoven. The class that participated in our user test was a group 5/6, with children in the age of between 8 and 10. Their teacher, Tanja Snijer, helped us in choosing motivated children to make sure our user test would succeed.

Four children from group five and four from group six participated. Four were boys and four were girls, resulting in one girl group and one boy group. This was what the children themselves wanted, but it also gave us the opportunity to compare boys and girls in relation to our concept.



BS Drents Dorp

Reactions on Project and Concept

We started by briefly explaining to the whole class who we are, what we do and what we were going to do with them. Tanja Snijer asked who wanted to participate and every child in the classroom raised his or her hand with enthusiasm. When eight children were chosen to participate, we took them to another classroom and explained our project and concept and their assignment in more detail, with the help of a Prezi presentation. This presentation included a storyboard that explained the concept.

After this explanation, the children still had several questions for us, especially about cancer and the hospital. Especially the girls were very interested, and they said that they really wanted to help these children. They were very happy that they were chosen to help in such a project. Coincidentally, one of the girls had had cancer herself, as she told us. This raised other questions, one girl asked if it was possible to be cured from cancer. We tried to explain all of this as best as we could. They thought that it was very good that we did this project for these children.

The boys were more interested in the concept. When we explained to them that it would be possible to let their drawings come to life, one responded enthusiastically with: "Oh, vet, gaan wij dat zo ook doen?" (Oh, cool, are we going to do that too?). Of course the actual test gave us more information, but the children's eagerness to participate definitely showed that the children liked our ideas.

Reactions on Templates and Drawings

Overall, the children reacted very enthusiastic on the idea of the templates. After an introduction, explanation and after we allowed the children to go and pick the templates they wanted, they all ran to the table with templates.

We did notice a clear difference in approach between the boys and the girls though, also already when picking the templates. The boys just randomly grabbed the templates they liked and took a lot of them to their drawing table, where the girls deliberately picked one template each, one they could draw something nice on. This difference was present during the entire session, with the boys improvising all the time and the girls working quite orderly.



The girls participating

As was to be expected, they used the templates, but also added their own drawings. A lot of extra drawings were added by the boys because they liked creating crazy drawings and by the girls for support of their stories. For some of the boys it was difficult to create original drawings though. The templates helped them in getting their drawing process started.



An interesting thing to see was that in general, they were drawn mostly to the more defined templates; the abstract ones didn't fire that much imagination. This was probably because the templates were so abstract that they had difficulties determining what they should draw in it; one boy even asked us what one template was supposed to be. They'd rather stuck to the templates like they were colouring pictures, instead of giving their own interpretation of the templates. This confirmed our expectation that the children do not prefer a too low level of definition in the templates. (see appendix B for all their drawings)



The boys while drawing



Some of the drawings created



The girls while drawing



Stories

When it came to creating a story to perform to the other group, a clear difference could be seen between the approach of the boys and the approach of the girls. The girls already had some ideas about the story they could create quite early in the drawing process, while the boys had to be reminded several times, because they had forgotten this part of the assignment. Therefore, what happened in both groups will be explained shortly.

The girls drew with a couple of templates and started to create a story with those. They were inspired by the movie Rio, and later by Tom and Jerry as well; they mentioned these several times in comparison with their own story. As they wanted everyone to participate evenly, they gave every drawing a role. They were soon ready with their story and added some extra drawings (without templates) for elements they needed in their story.

When they had to perform, they told the story quite clearly. They did not really keep the performance in mind and stood with their backs to the audience; it was more playing than performing. Still, they kept the story in mind and followed it. One of the girls naturally took up the role of narrator to give the story a little more structure and a clear ending.

The boys did not think of the story at all in the beginning. They had started drawing what they liked, and only thought of the story when we reminded them. Still, they could not find a structured way to agree upon a story. The drawings did not fit together very well and they did not find the creativity to make them fit. This showed in their performance as well.

They stood in front of the screen with a lot of drawings, making noises, letting the drawings bump into each other and screaming what happened to their drawings. They were not performing at all, but they were playing with their creations. Instead of having a structured story, they came up with actions that followed on other actions.

Remarkably, both stories included drawings killing or hurting each other. Even in the story of the girls, a bear died. In the story of the boys it was more overall aggression. This could of course be something specific for the age category we tested with. In order to know for sure, we would have to test with other age groups as well.



The girls performing



Conclusions

All in all, we received a lot of information from this user test, including answers to all our posed questions. Below, the answers to these questions are explained.

Level of definition in the drawing templates

The children preferred drawing templates that were defined enough to recognize easily what it was supposed to be. Templates that left more to the imagination mainly caused confusion and were therefore not used.

Templates or original drawings

The children used both the templates and original drawings. The templates were used as a general guidance for their stories and as a source of inspiration to get the drawing process started. The original drawings were a lot of fun for the more creative children, as they gave them more freedom in using their imagination. Also, as showed especially in the work of the girls, they were used to add little elements needed in the play, that were not present in the templates.

Enthusiasm for creating drawings that come to life

As far as we could judge, the children liked our concept very much. Also, from the way they played with their own drawings, we can conclude that the children liked to let their drawings live through events and stories. We do not know if this would also count for a longer period of time.

Stories the children like to create

It turned out that the amount of structured story children like to use is dependent on the personal preference of the child and on gender. In our test, the girls used a lot more structured story than the boys. Still, all children liked creating new situations as a consequence of other actions; creating stories as they go. Therefore, the interaction should allow children the freedom to easily create stories while playing.

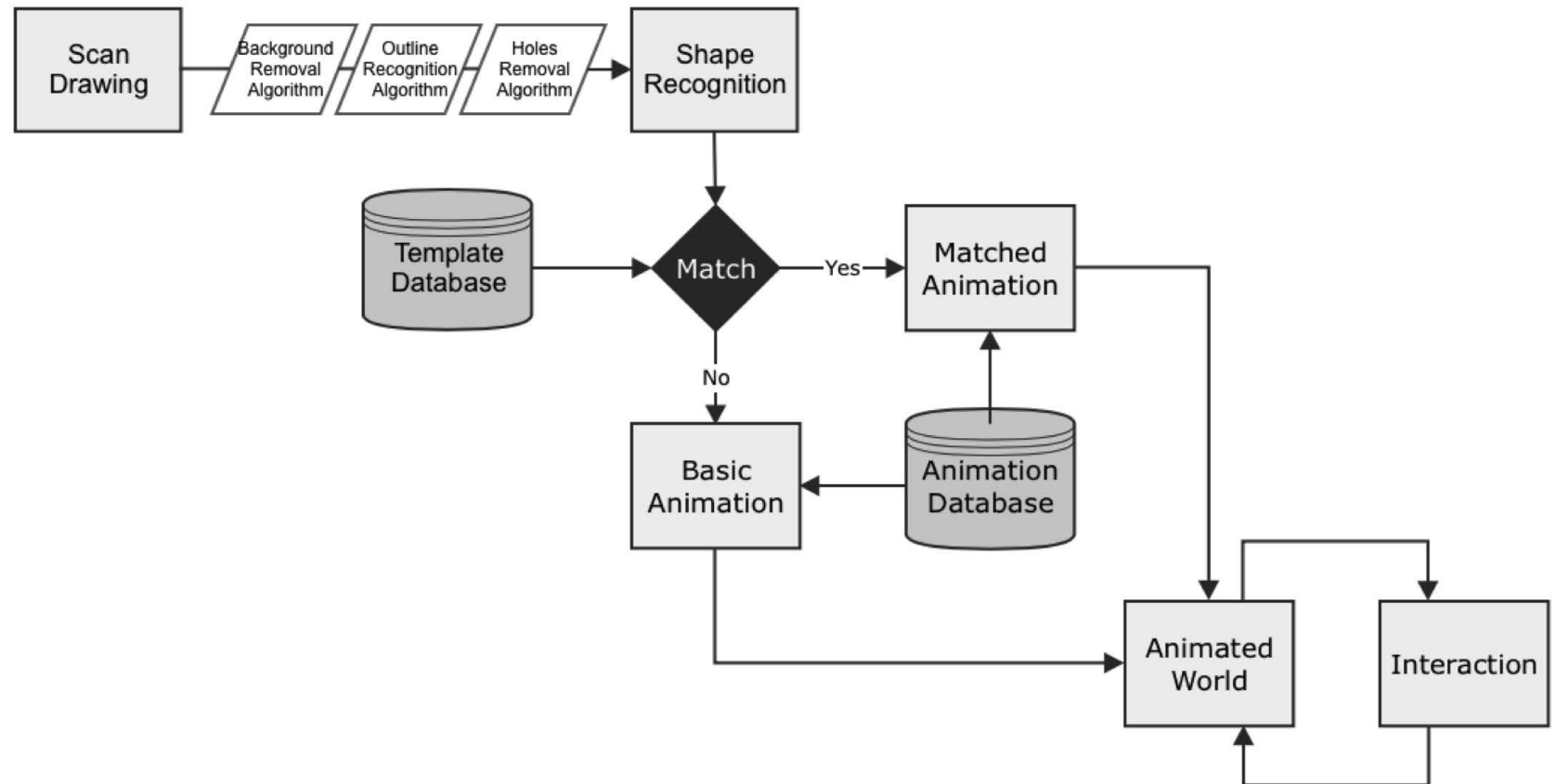
Specific interactions

Interactions that returned several times were actions with violence and death. Of course, this would not really be suitable for the younger children, but we should definitely keep in mind that a little bit of action might also keep playing interesting. Interaction with passive objects like trees was also something that appeared several times in the children's play. Both groups drew a sun and the girls used two trees and a cave. Therefore, objects should not always be moving, but interaction should still be possible.

Software

The software for the concept will mainly consist of three parts. First, the drawing the children insert has to be analysed for shape recognition. Then, the outcome of this shape recognition has to be matched with an image database and a character animation database related to that.

The drawing of the children then has to be coupled with the matching animation and implemented in the Doedel World. At last, the animation should be build so, that it can smoothly switch between realistic self induced behaviour and extensive interaction with the children.





The technique for scanning the drawings doesn't have to be complex; the main focus should lie with making a digital copy of the picture. On this picture, then, a combination of algorithms should be applied, analysing the borders of the drawing and trying to recognize shapes. This shape recognition could work in different ways; through analysis of basic shapes, matching stickfigures or tracing the images back into templates. We tried to write one version of this code for the final presentation, but decided it too time-consuming for making a simple concept.

When the picture has been analysed, the computer has to try to match the drawing with a fitting animation. Therefore, the program needs an extensive database in which a lot of different animations can be stored and accessed easily. A lot of these animations will have to be made, based on an analysis of classifications or on what could be moving parts in children's drawings.

If a match is found between a children's drawing and a "template" in the database, the hardest part of the work is done; the animation can be applied to the children's drawing and placed appropriately into the animated world. Here, the preprogrammed though elaborate animation allows the children to see their creative products come to life.

However, if there is no match, the system should be able to handle such a situation as well. In that case, the computer should be able to do something basic or funny with the drawing as well, so that it will become visible in the animated world either way.

Finally, the big strength of our concept is that the drawings respond to the children's behaviour in a very extensive, near to natural way. Animals that live their own lives but react to what you do with them as well, objects that behave like they would in real life. If attention is paid well enough to these details, the experience of this second world for the children should become unforgettable.

Implementation in the Hospital

There are several ways in which this concept can be implemented in the new Maxima Centre. Each aspect or way of implementation has its own pros and cons, which will be discussed below.

First of all, the way in which the world is shown somewhere in the hospital can be chosen. It can be done through projection, with a projector and a white wall or screen. One of the disadvantages of such an installation is that the surroundings should be somewhat dark in order to be able to see the projection clearly. As the Centre is supposed to be very light and open, this might not fit very well.

The interactivity would become very easy and would not acquire a lot of extra money, as the projectors used can be projectors with sensors incorporated in them.

Another option could be to use a large screen. For a screen, the surroundings do not have to be darkened; the screen brightness can just be adjusted to make sure the pictures are clearly visible. However, this method might be a lot more vulnerable and expensive.

Further implementation of the concept could include projections in the patient's rooms as well, next to the projection(s) in public spaces. This would enable the children to see what happens outside of their rooms and might encourage them to join the playing in the public rooms, as they might want to change the projection as well.

This can and should be done through projection, as it is not a big problem if the pictures are not completely visible. It will mostly work as ambient lighting or decoration, and to attract children to the public spaces.

The concept can be expanded by creating several worlds or environments, all displayed with a projection or screen at different spots in public spaces. That way, the world within the hospital will stretch over the whole hospital. This will also create more diversity in the projections the children can display in their own rooms. It will give the children the possibility to explore the different environments and it will add a surprise element, as different templates could work for different environments. Of course it will be quite expensive to implement this, especially as it is not necessary for the concept to be effective, but it will increase the overall play experience and it is therefore good to mention as a possibility.

The placement of the scanner should be chosen carefully. It should be easy to access for all children, to make sure everyone can add creations to the world.

In order to have the concept working, a lot of templates should be printed. This, of course, would cost a lot of money and is not very environment friendly. Therefore, it might be an idea take in used templates if the children don't want to keep their drawings and recycle those to make new paper.

In appendix E, the visualization of our ideas on the implementation in the hospital can be found.



Final Demo Day

During Final Demo Day, we decided to present with a big projection, just as it would be in the hospital. We created a program that showed several children's drawings (from the user test) moving across the screen. You could put your hand against the screen to interact with the birds. [10]

We decided to use a forest background [4] for the presentation, because it is a general theme which is still mysterious and fantasy-like. We chose for this picture, because we wanted the drawings to stand out, but we did not want a picture that was too realistic.



Feedback Final Demo Day

During the Final Demo Day, we received a lot of positive reactions on our concept. Many people were very enthusiastic about the fact that children could make their own creations come to life. Some even said that they would still like to play with it themselves and that they hoped that our concept could be realized within the hospital.

Our client also liked our concept. We received a coin, which means that we might get the chance to continue with this project and realize it. Cees Henzen from the Prinses Máxima Center said, as he gave us a coin: "Ik vind jullie concept toch ook wel erg leuk!" (I really like your concept!)

We also received some more concrete points of feedback on the final concept.

- Several people wondered whether the drawing would stay yours once you put in on the screen, or whether everyone would be able to play with it.
- The amount of action that is determined by the system versus the amount of freedom the child has is definitely something that needs more attention.
- Someone mentioned that we have created a ritual, by making the scanner into a teleportation machine. This has a lot of added value, as it really makes it something special for the children to do.
- The machine might look like hospital machines such as MRI scanners; we have to watch out that children do not associate it with these kind of machines. We might need to look into science fiction references to make it more magical.
- Several people commented on the background; it might be a nice addition to have the background created by children as well. People also liked the fact that we want to have more backgrounds and themes available.



Our stand during Demo Day in Orange Space



Future Plans





Future Plans

The most work that still is to be done will be in making the concept more tangible and achievable. We would work on the implementation of drawings without templates in the system and on the recognition of the templates, by maybe outsourcing the code written and getting into contact with Team-Lab, whom we met in Milano. Likewise, the scanner should be made to work. The scanner technique, or an alternative to that, should be implemented in a new prototype of which the formgiving should be reconsidered. Currently no supporting evidence has been obtained for this shape and materials. This could be done by doing more user testing and form exploration with primary school children, or even real patients.

Also we would go more in depth on the interaction design for the interaction between the children, the Doedel world and the scanner. We want to add more interactions for children with the drawings, and design more interactions between the drawings as well. The system should be able to decide when to interact with the children and when to do something on its own initiative. One other important point we want to focus on is how to enable the concept to actually interact with the children, through touch screen, Kinect by Microsoft© or other sensors.

During the Final Demo Days we also got the feedback that it might be interesting to take a look at other applications for the concept, in other hospitals or public spaces. We want to look into that as an additional elaboration, by making a business model for the concept.

Doedel

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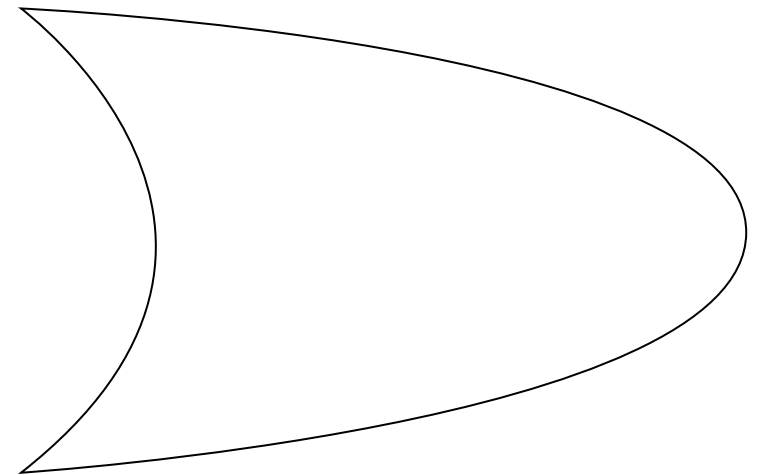
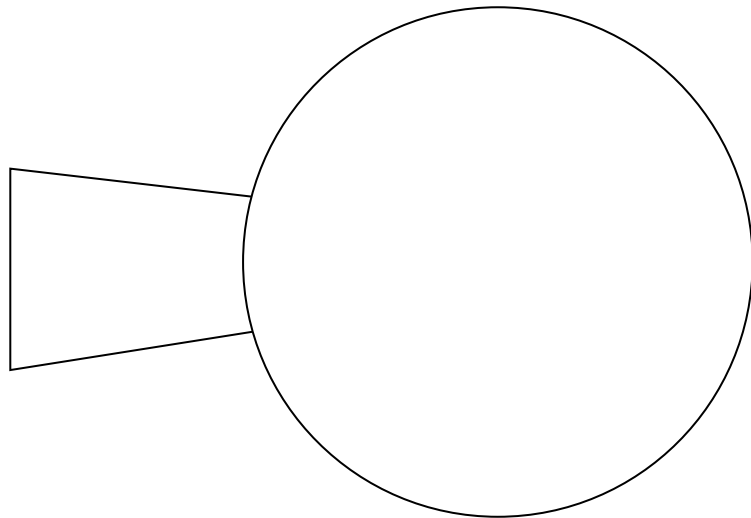
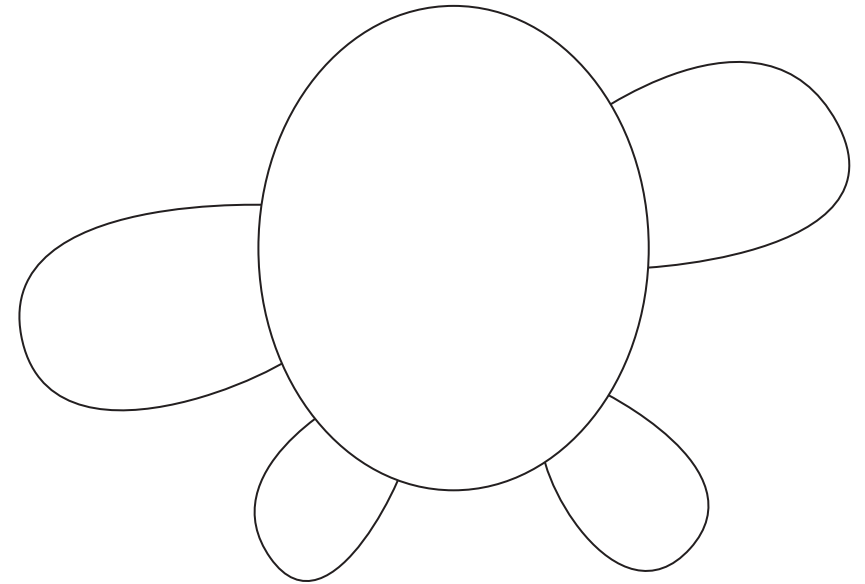
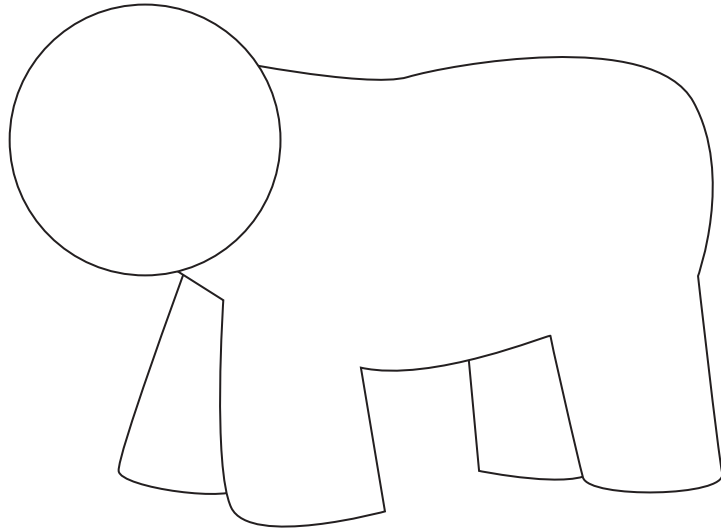
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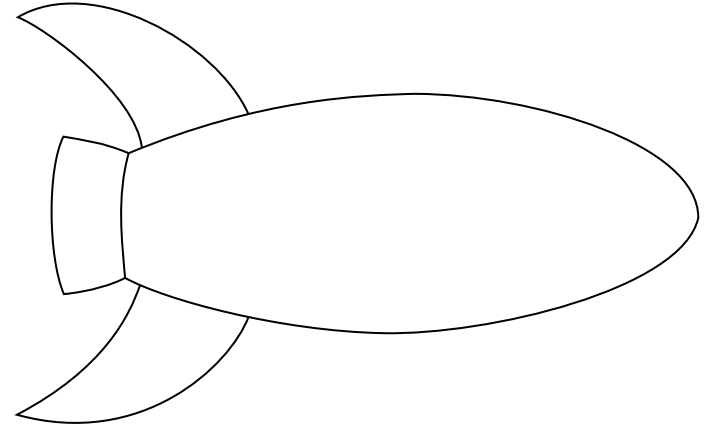
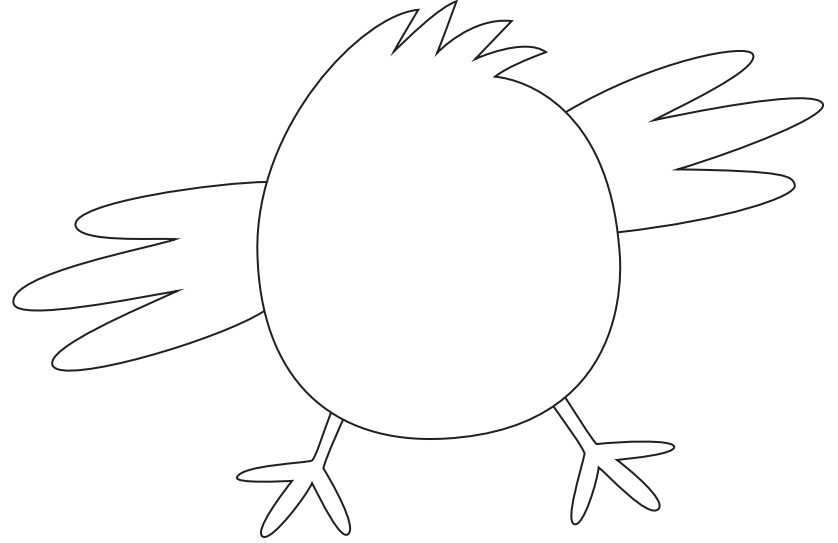
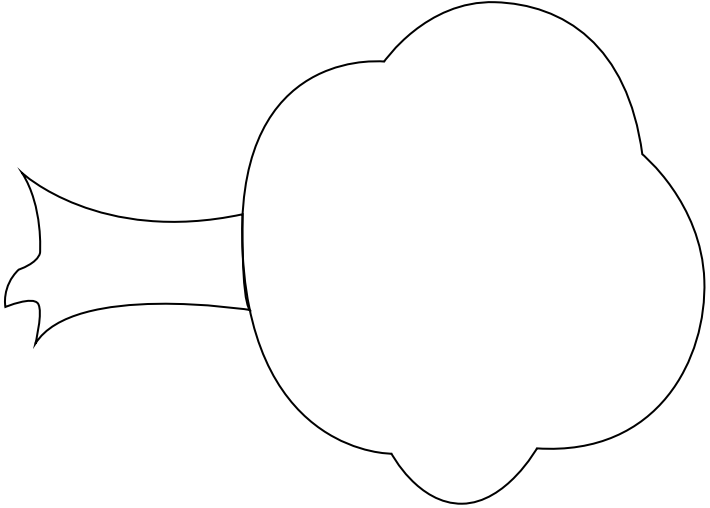
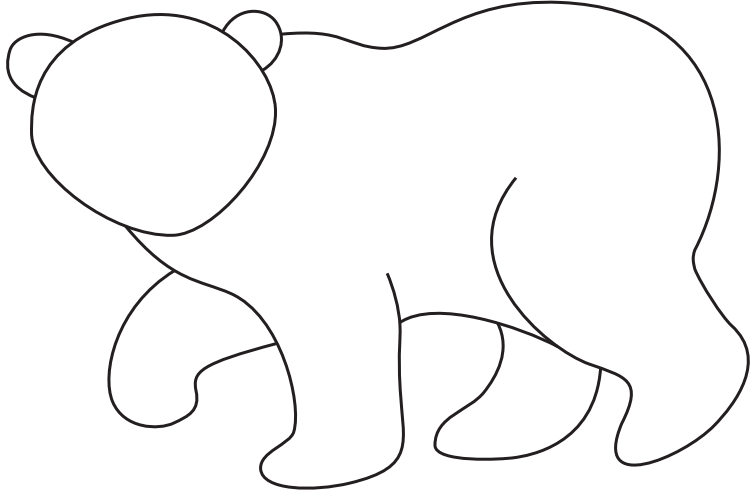
[10] Processing Code Animation Final Demo Day
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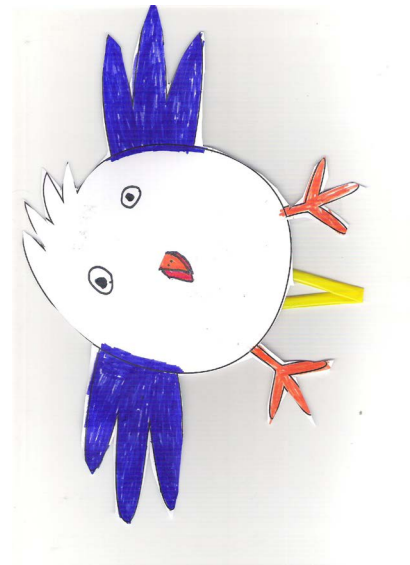
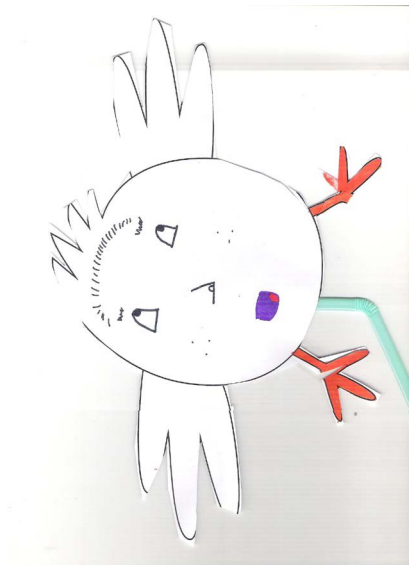
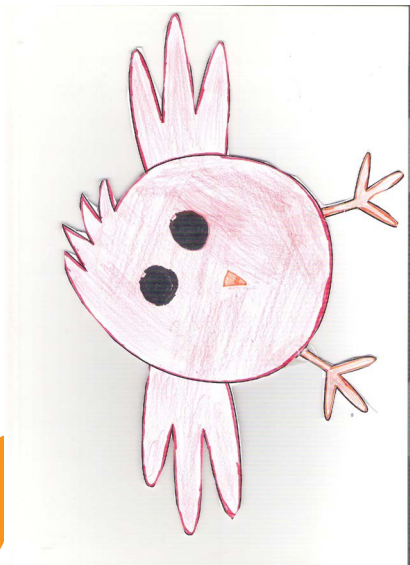
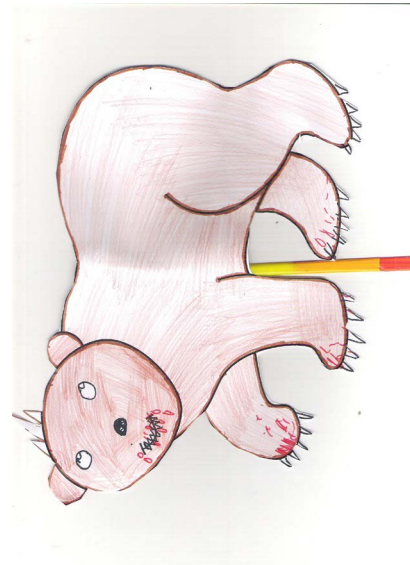
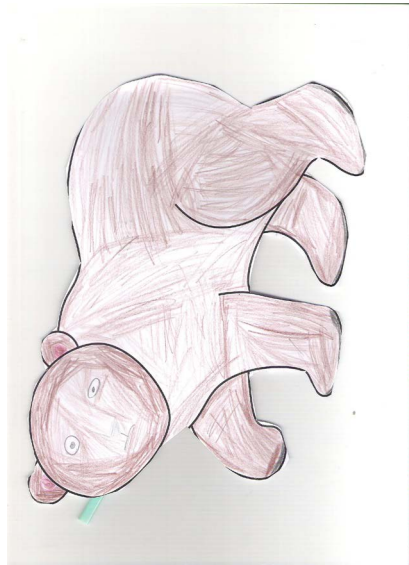
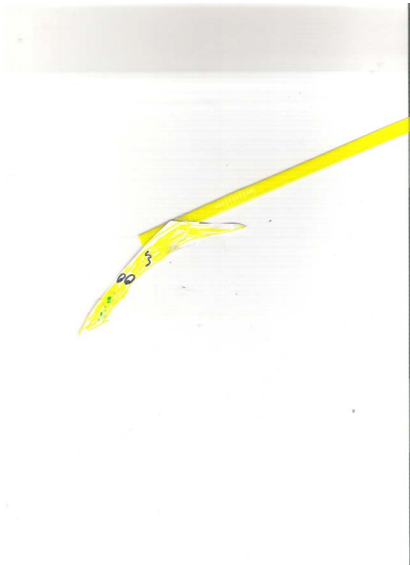
Appendix A: Drawing Templates



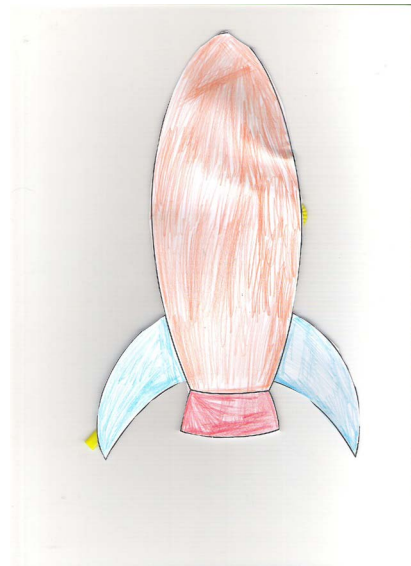
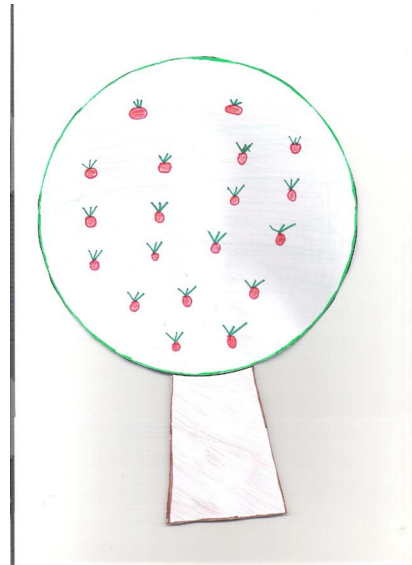
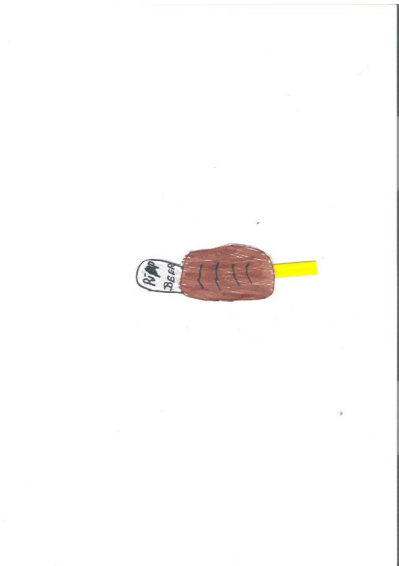
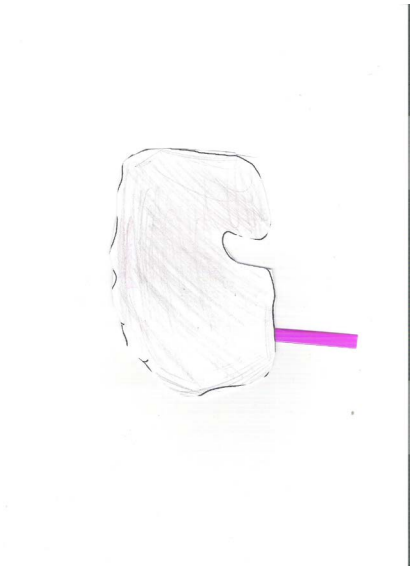
Appendix A



Appendix B: Drawings User Test



Appendix B



Appendix C: Pitch JIP

Children love to explore. From the moment they are born, they start exploring the world around them, starting from their own hands and feet, to their parents, their house, their school. But when they move into a hospital, their world which has slowly grown is suddenly reduced to only one building. Of course it is a new environment, but this will only be for a while. The children need an imaginative world they can explore, but this is normally not present in a hospital.

What if this would be different? What if the hospital would be a portal, a portal to a fantasy world in which nothing is as it seems? And this new world can be explored, played with, and changed according to the fantasy of the child?

We want to create such a world, with endless possibilities for children to play. We came up with the idea of several connected theme play rooms within the hospital. For example under the sea, pirates, under the ground or jungle. For now, we have focused on a space with a jungle theme, because jungles have hidden, mystical places everywhere, and possibilities to climb, hide and play games.

A map of our jungle would look like this. There will be a lot of green, with which the interactive elements will fit. The elements we focused on are a jungle tree, an old temple, a waterfall and tropical flowers. With these, we want to create places for the children to retreat, but we also want to add something to their play, which encourages their imagination and play experience.

To go a little into depth: This is one of the flowers. It is designed to quickly retreat as a child comes near, something which can be fun to play with for younger children, or used as an extra challenge within games for the somewhat older children. Both the temple and the waterfall provide games and puzzles to find hidden passageways to other theme rooms, while the tree is more of a place children can hide or meet.

As you can see, there are already plenty of hidden treasures in the jungle part of this world within the hospital. By finding secrets and learning the rules of this special world, we assume that the children will be able to explore and play in a very natural way. The children can use their imagination to create many stories in this very special world.



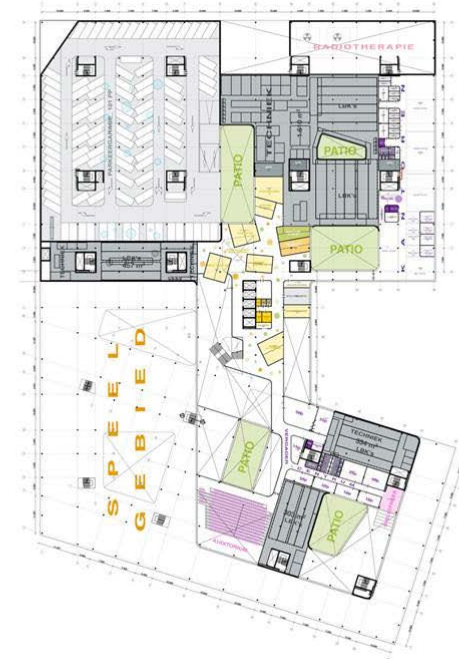
Appendix D: Building Plans

Appendix D

Begane grond



1ste verdieping





2de verdieping

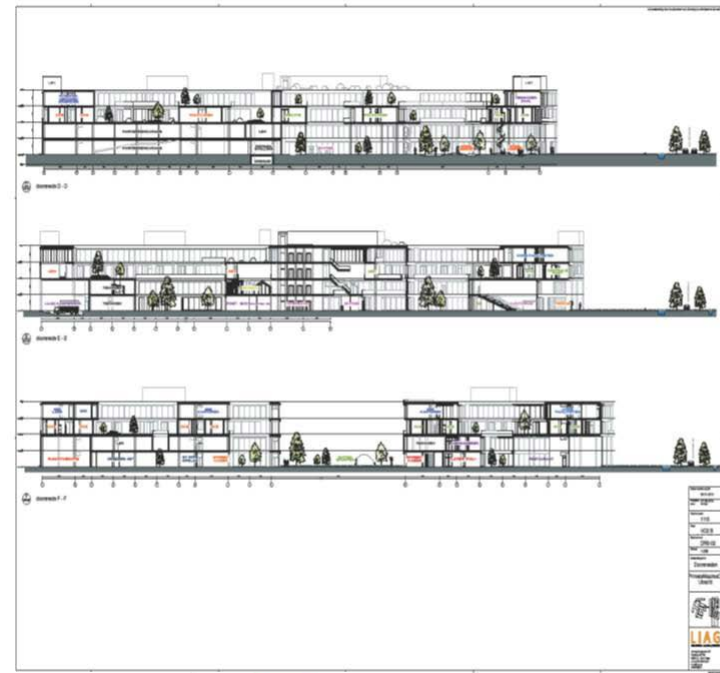


3de verdieping





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6



7

Appendix E: Visualization



Appendix E

