

Sculpture showing “life-purpose” quotes

A kinetic sculpture developed for Menperium

Samantha Galvez Vargas

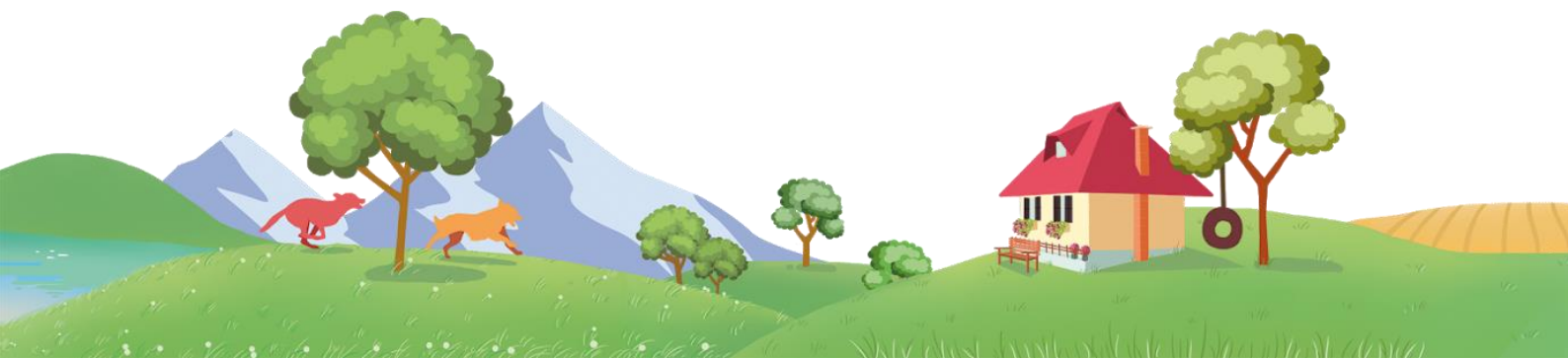
In cooperation with Sjoerd Baarslag
V1.0 6-7 2018

Bachelor Thesis Creative Technology, University
of Twente

Client: Menperium

Supervisor: W. Eggink

Critical Observers: R. Bults and A. Schaafstal



Acknowledgement

After three years of completing assignments and writing reports this is my last project at the University of Twente. The end result is something I had not dared of dreaming of. Together with my partner Sjoerd Baarslag we created something unforgettable.

I want to thank my partner for the very smooth cooperation and the feedback when needed. Without his input some of the elements in the installation would have looked very different. I would also like to thank Wouter Eggink and Richard Bults for the feedback and supervision on this thesis and project. Not to forget Han Davina, technician at the Vrijhof, who helped us in the wood workshop. Without his help we would probably have lost all our twenty fingers. Not only did he explain how the tools worked, but he also helped us setting up the testing environment. Many thanks to Joris Quist for helping me with programming and the mental support in a hectic period of my bachelors.

Abstract

This project is executed for the company Menperium that specializes in motivational sculptures. In the past they created sculptures which convey motivating and encouraging messages to employees. They gave us the challenge of designing and creating a motivational sculpture showing life purpose quotes. Beforehand, research was conducted into various types of art installations. Distinctions between these installations have been found and were used during the ideation phase. A literature review in order to understand the components of interactive art installations and which explores various strategies and frameworks has been made. Some of the explored and discussed strategies have been used in further research and in the testing phase of the project. Next, multiple concept ideas have been created while keeping the requirements given by Menperium in mind. Then all concepts were weighed out with the requirements to see if the idea was eligible for further development. The final concept met all the requirements and was thus chosen to be created. The components of the chosen idea were further specified and realized. In order to finalize the product all components were assembled. The finalized prototype was placed in the hallway of the Vrijhof to execute the prepared tests. Very interesting observations and results came out of the experiments. Unfortunately, the installation did not meet the envisioned result on passersby. It was expected that the passersby understood the meaning and story behind the prototype, but this was most of the time not the case. Also, the amount of people standing still in order to observe the installation was moderate, yet if the prototype is going to be sold to companies the amount of people who have interest in it should be brought up. Future recommendations including adding a title or a sign with an explanation are given.

Index

1. Introduction.....	5
1.1 Problem statement.....	5
1.1.1 Research questions.....	5
2. Related work	7
2.1 Interactive art installation	7
2.1.1 Just like drops in time	7
2.1.2 The Beach	8
2.1.3 CLOUD.....	8
2.1.4 Flowers and People	9
2.2 Art installations with a deeper meaning.....	9
2.2.1 Slight uncertainty	10
2.2.2 Lure series.....	10
2.3 Communication between art and environment.....	11
2.4 Art installations and motivation.....	12
2.5 Addressing the components of an interactive art installation.....	14
2.6.1 Introduction.....	14
2.6.2 Analyzing Experience	14
2.6.3 Aspects which affect attraction.	16
2.6.4 Measuring success of an art installation.....	17
2.6.5 Conclusion.....	18
2.7 The implementation of non-human encouragement.....	19
3. Ideation.....	20
3.1 Requirements	20
3.2 Concepts	21
3.2.1 Shape changing blob	21
3.2.2 Pie idea.....	23
3.2.3 Shooting balls.....	25
3.2.4 Rope idea	27
3.2.5 Marbles	29
3.2.6 Stop motion.....	31
3.3 Discussion on chosen concept.....	33
3.3.1. Theme.....	33
3.3.2 Art style	33
3.3.3 Camera.....	35

3.3.4 Chain	36
3.3.6 Puppet.....	36
3.3.7 Screen for motivational quotes	38
3.3.8 Pedestal	38
3.3.9 Final setup.....	38
4. Specification	40
4.1 Component specification	40
4.1.1 Landscape	40
4.1.2 Chains.....	41
4.1.3 Pedestal	42
4.1.4 Automata.....	43
4.1.5 Camera	44
5. Realization.....	45
5.1 Component realization	45
5.1.1 Making of the pedestal	45
5.1.2 Printing out the landscape.....	46
5.1.3 Building the automata	48
5.1.4 Making of the camera	49
5.1.5 Putting together the chains	49
5.1.6 Program showing motivational quotes	50
6. Evaluation.....	52
6.1 Research method	52
6.1.1 Setting up the environment	52
6.1.2 What information is contemplated and how to get it	53
6.2 Results	54
6.3 Conclusion	57
6.4 Client evaluation	59
7. Conclusion & Future recommendations	61
7.1 Conclusion	61
7.2 Future recommendations.....	64
References.....	67
Appendix.....	71
Photos of installation.....	71
Processing screen code.....	74

1. Introduction

Nowadays it is very clear that a good and encouraging work environment ensures better work performance and favorable results in the long run (Taylor & Westover, 2011). This is why companies spend time and money in making a motivational work place for their workers. Motivation can be brought over in various ways, one of them is through art. Art has been a medium to deliver ideas and messages for centuries. A company which uses sculptures in order to convey motivational and encouraging messages is Menperium (Mensink, n.b). These sculptures are intertwined with technology and use a variety of lights, movement and use of space. In the art world this form of art is called installation art. Art installations are three-dimensional and try to reconstruct the perspective on the space where this installation is positioned (Tate, n.d). They can be interactive, motivational, meaningful, immersive, virtual reality etc. Settings such as museums, galleries and theatres are where this combination of art and technology is blooming the most.

1.1 Problem statement

The assignment for this graduation project was given by Menperium, a company which specializes in motivational sculptures. These sculptures show a concept or idea which gives a better perspective on the environment around us (Mensink, n.d). Many of these sculptures are put in hallways of companies so that everyone who passes by can see them and get inspired every day. Not only do they make inspirational sculptures, but they also give lectures that will inspire and motivate you to work on your ambitions. Menperium requested a motivational sculpture, a sculpture which encourages employees to reach their personal goals. Several requirements include showing inspirational quotes, a new creative way to present these quotes in the sculpture, a need to keep the statue intriguing and it should be reproducible. What the sculpture should further look like or what message the sculpture should convey is not requested and should be further analyzed. The challenge for this graduation project is to design and make a motivational sculpture showing quotes. Together with Sjoerd Baarslag this challenge will be tackled.

1.1.1 Research questions

The problem statement leads to the final research question:

“How can an art installation showing quotes, placed in the hallway of a company, bring out employees’ intrinsic motivation in order to reach personal goals.”

Various sub-questions have been created in order to make this research more specific and goal-oriented:

- *How do artists incorporate interaction into their installations?*
- *How do artists incorporate a story into their art installations?*
- *How do artists create a communication between their art piece and the environment*
- *How do artists embody motivation into their art pieces?*
- *How does one make an engaging interactive art installation?*
- *What is the best way to implement non-human encouragement?*
- *Do the passersby understand the meaning and function of the prototype?*
- *How well does the realized prototype keep the attention of passersby?*
- *Does the realized prototype spark curiosity in passersby while people are still interacting with it?*

This research has been divided in two bigger researches. Sjoerd Baarslag examined the communication between art and environment, conveying motivation in art and non-human encouragement. He will also try to answer the question if passersby understand the meaning and function of the prototype. I will analyze art installations which have a story incorporated, interactive art installations and how one can make an interactive art installation engaging. During the testing phase the last two questions will be researched and answered by me. The results and findings of Sjoerd's research will be summarized and briefly mentioned in this paper.

2. Related work

There is not one correct way to design and make art installations. Various popular installations have different goals which they want to bring on the audience. They can range from small and very simple ones to big and complex designs. In this chapter several examples will be given to describe different art installations. A better understanding on the big variety in art installations will be gained. These researches had a great influence on further decisions made in this project.

2.1 Interactive art installation

Art installations have various interesting categories, one of them is interactive art installations. This form of art is not complete on itself. It needs the physical presence of people to be fully functional and achieve its purpose (“Interactive art”, 2018). Most of these installations use sensors, computers and interfaces in order to gain input from the audience which leads to a response, but not all interactive art installations rely on technology to do their job.

2.1.1 Just like drops in time

Interactive art installations do not have to be technical. Ernesto Neto’s “Just like drops in time, nothing” is a good example of an interactive art installation that interacts with people through senses without the use of sensors or computers. This installation stimulates the senses, especially your sense of smell. Most of the installation is made from elastic fabric filled with different kind of spices which are so strong that the gallery becomes filled with aromas. Ernesto Neto tries to take the viewers on a journey where he intends to make them aware of their body and senses.



Figure 2.1.1: Just like drops in time, nothing (2002)

2.1.2 The Beach



Figure 2.1.2: The Beach (2015)

The beach (Snarkitecture, 2015) is another good example of a non-technical interactive art installation. This installation represents a summer day on a beach. Various elements like deck chairs and beach umbrellas are placed on the 15 meter “shoreline” to make this representation stronger. Everyday materials like mirrors, scaffolding and paneling have been used to build a 929 square meter enclosure with a sloped floor. Over a million recyclable plastic balls were made and put in this box to represent the ocean. Everyone is allowed to go in the plastic ocean to relax, play and explore. The beach was originated in Washington and has travelled in the following years to Florida and Sydney.

2.1.3 CLOUD

An installation like CLOUD (Caitlan r.c. Brown, 2012) needs people to interact with it or else it will be half complete. Brown made this installation by using only recycled light bulbs which she collected by putting advertisements in newspapers and on her website. The bulbs



Figure 2.1.3: CLOUD (2012)

that she gathered were put in clusters in order to form cloud like shapes. These clusters were then again put together to make the final cloud. The cloud is secured by a stand under it. Viewers are able to pull the strings dangling down the cloud. When bulbs are turned off and turned on again the feeling of thunder is created. Brown states that the installation is an icon of hope, optimism and collective action. CLOUD was showcased in many countries such as Russia, Czech Republic, Israel, The Netherlands, Singapore and Portugal.

2.1.4 Flowers and People

Flowers and People (Teamlab, 2015) is an interactive art installation which shows the life cycle of flowers. At first glance it did not look out of the ordinary, but the trick lies in the movement and distance of the visitors. Whenever a person walks up to the screen, flowers bloom or fade away. There is no loop or recorded movie behind the visualizations, so the visual states can never be mirrored or duplicated. This cycle of blooming flowers or decaying flowers will continue to make different images. This project has 10 more variations and each variation has its own unique design.



Figure 2.1.4: Flowers and People (2015)

2.2 Art installations with a deeper meaning

Art is being seen by many as a subjective field in which interpretations vary per person. It reflects ideas, experiences, concepts, emotions and knowledge. In this part of the research various art installations that convey experiences and stories, will be presented.

2.2.1 Slight uncertainty



Figure 2.2.1: *Slight uncertainty* (2012)

in Prague and formerly seen at the Festival MEsto artistic Lidem in Ceske. The installation is displayed in figure 2.2.1.

A very interesting art installation with a deeper meaning is “Slight uncertainty” (Michal Trpak, 2012). The installation by Czech artist Michal Trpak consist of several people holding an umbrella in one hand and a work bag in the other. They are hanging from their umbrellas which are attached to the ceiling. The material used for the figures gives a big contrast with the situational lightness of the installation. These people should represent the middle class society who are the unlucky ones of the economic recession. The figures have sad and desperate expressions with their heads tilted downwards. They are- according to Trpak- uncertain of the unsure landing and length of the flight, but their uncertainty decreases because of the umbrellas that make them fly.

This installation can be seen at the EBS Office

2.2.2 Lure series

Another meaningful installation was created by Beili Liu studio. The Lure series (Beili Liu studio, 2008) contain several adaptations- including Lure/Rise (san Francisco), Lure/Forest (Los Angeles), Lure/Fall (Finland), Lure/Return (Shanghai), Lure/Munich, and Lure Kaunas- which are created different for the space given. The first adaption made was Lure/forest in Los Angeles. This unique series of installations is based on an old Chinese folklore which tells that all new born children come in to this world with a red and invisible thread attached to them. This thread goes all the way to the one who they are destined to be with. When the years pass these two people come closer until they eventually find each other. They will surpass cultural and social divides. The installation consists of hand spiraled coils made of red thread attached to the ceiling of the gallery. Every coil is connected to one another which represents a couple and this couple is made from one single thread. In the center of these coils a needle is put through that makes is possible for the coil to stay a few inches from the ground. Whenever air flows through the installation, coils swing and red thread falls onto the ground. The thread tends to tangle on the ground for an amazing effect of connectedness.



Figure 2.2.2: Lure series (2008-2012)

2.3 Communication between art and environment

As mentioned before, Sjoerd Baarslag has done research on the following topics: Communication between art and environment and art and motivation. The following summarized paragraphs will explain the topics specified above.

Sjoerd looked into communication between art and environment. According to his research this topic can be further distinguished in five sub-methods, namely:

- Communicating with the shape and rhythm of the surroundings.
- Reuse of materials.
- Similar use of colors.
- Interaction with the environment.
- Reshaping the environment.

He explains each method with examples of installations. The first method is used by artists who want to make their installation blend in the environment. They use materials which represent the environment. One of the characteristics of the second method is that it is often used in public art and reuses the materials found in this environment. As the name already states, the third method uses the colors out of the environment in the installations. The second to last method makes their installations seem as if they are supposed to be there, interacting with the environment. “Le désir et la Menace” by Cédric Le Borgne is a good example of this method.



Figure 2.4.15, Le Désir et la Menace

The last method is reshaping the environment by applying gentle changes, or adding a complete new dimension. In “Laputa” made by Outofstock a new world is made inside a white tent.



Figure 2.4.21 and 2.4.22, Laputa

2.4 Art installations and motivation

The next topic is art installations which convey motivation through different ways. Sjoerd Baarslag listed several examples with different intentions and goals. Just like the previous topic he assumed two distinctions, namely:

- Direct behavioral change.
- Indirect behavioral change.

The first distinction is direct behavioral change and as the name states, installations have a clear goal on how people should change their behavior. “The Trash Talk Campagin” is a very explanatory case. This bin encourages people to use their cigarette buds to vote. The goals is to keep the streets clean.



Figure 2.5.1, Trash Talk Campaign

The following distinction have no clear actions for the people to follow, however the message behind the installation is clear. The “Ice watch” installation consists of only big rocks of ice placed in front of the climate conference in Paris. The goals is to inspire people to take actions against global warming.



Figure 2.5.4, Ice Watch

2.5 Addressing the components of an interactive art installation

In this literature review the components on how to make an interactive art installation are given. Several frameworks and strategies are explored and discussed. Some explored strategies are going to be used in the ideation and testing phase.

2.6.1 Introduction

Art has been evolving over time and has eventually reached a point where it has started to intertwine with technology. Settings such as museums, galleries and theatres are where this combination of art and technology is blooming the most. Art expositions are not only canvases and statues anymore. A few years back expositions were formed specifically aimed at showcasing art and technology installations. A few examples are Gogbot and Hacking arts. As an artist you want to find new ways to surprise, mesmerize and fascinate your audience. One of the many solutions to do so is interaction with the art installation. Art installations are three-dimensional and try to reconstruct the perspective on the space where this installation is positioned (Tate, n.d). They can be interactive, motivational, meaningful, immersive virtual reality etc. This literature review is part of a graduation project which will focus on creating a statue that shows quotes. A lot of freedom is given by the commissioning company, so how this statue will be created and look like depends on the findings of this literature review. The commissioning company did request that this statue should be placed in a company's hallway and should motivate and inspire the passersby to work on themselves. A final request was that the statue needed to attract and encourage passersby to interact with it.

The objective of this literature review is to find out how one makes an engaging interactive art installation. The gathered information will be used to create a guideline for future research in the project. This review will also have three sub-questions which will help answer the research question. An important factor for any art installation is that the user has a good experience, so how can you design for experience? The last two sub-questions are: What makes an art installation attractive and how can you measure how attractive an interactive art installation is. Basic aspects of an interactive art installation will be reviewed in order to find answers on the sub-questions. This review will be structured in the following way: First, experience with interactive interfaces will be researched. Secondly, the aspects which affect the attraction of an interactive art installation will be reviewed. Several strategies will be explored. And lastly, multiple ways to measure attraction will be summarized and analyzed.

2.6.2 Analyzing Experience

When designing new products there are several aspects which need to be taken into account. In the next section important aspects of product design will be presented.

Usability is as mentioned by Battarbee and Koskinen (2005) important for the human-product experience, but on its own it will not be enough to assure the success of the product. So, in the last few years there has been an extensive interest for “experience” in Human Computer Interaction (HCI) (Kaye,2007). Designing for experience can be done after an explanation of product experience has been provided. Hekkert (2006) defines product experiences as: “The entire set of affects that is elicited by the interaction between a user and a product, including the degree to which all our senses are gratified, the meanings we attach to the product and the feelings and emotions that are elicited.” Following Hekkert (2006) there are three aspects of product experience: emotional response, attribution of meaning and aesthetic pleasure. It has been suggested that aesthetic pleasure together with attention and attraction are all needed for experience (Gajendar, 2003).

Forlizzi and Ford (2000) researched user experience and how to design for it. They made an initial framework which makes understanding experience in human-product interaction easier and meaningful for designers. The framework consists of four components: sub-consciousness (thoughtless experience), cognition (e.g. experience of trying new products), narrative (formalized experience) and storytelling (subjective experience). Figure 1 shows the framework in relation with interaction design. They explain that shifts among the components can occur. When a shift happens e.g. from sub-conscious to cognitive the user encounters something unexpected which forces him to think about it. The designer knows by this shift that an error has occurred in his product and needs to re-evaluate his design. Forlizzi and Battarbee (2004) continued this research and made a second framework based on Forlizzi and Ford’s work. They disassembled experience in three components: experience (“self-talk” while using a new product), an experience (inspires behavioral and emotional change) and co-experience (creating involvement with others while using the product). When using this framework Forlizzi and Ford explained that user-product interactions should be set up to understand the people, contexts and activities and later onto specify a solution for the problem. Having the above mentioned frameworks in mind while designing for experience, spectators get as stated by Reeves, Benford, O’Malley, and Fraser (2005)- interested in the interactive system by participants and motivated to interact with it. Thus, in order to improve spectator experience they studied the spectator experience on public interfaces and created four broad design strategies:

- Secretive, where the interaction is hidden
- Expressive, where the interaction is revealed
- Magical, where the effects after interaction are revealed except the inter-action itself
- Suspenseful, where the interaction is revealed, but the effect after interaction not.

Each one of these strategies will benefit a creator of interactive art installations, because it will provoke the curiosity in spectators and heighten the ‘payoff’ when it will finally be

their turn. So, product design, usability and experience are important while designing a new product. Importance should be put into user experience and spectator experience.

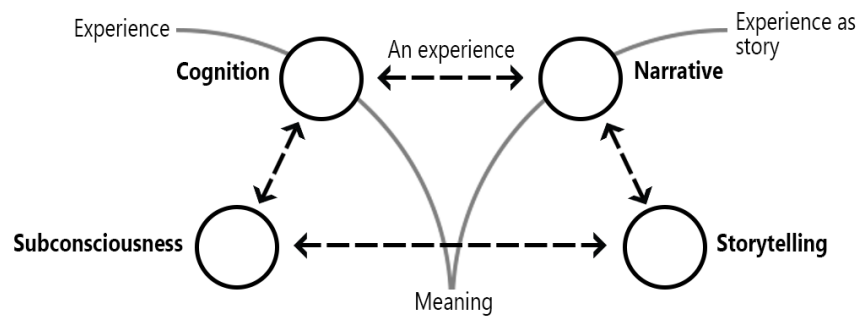


Figure 2.4.1: Forlizzi and Ford's framework in relation with interaction design.

2.6.3 Aspects which affect attraction.

After experience has been designed one should think about the way to attract passersby to the art installation. As a designer you want to create an interactive art installation which attracts many participants. There are several aspects which attract passersby. This chapter will elaborate on some of those aspects.

Attraction is defined by Dewey (2005) as: "The initial impulse towards environmental stimuli and then processed by emotion, which provides synthesis among various parts." As mentioned earlier in this review, attention is needed for attraction. The attention of humans is caught by common things like moving (Howard & Holcombe, 2010), sound transmitting (Torta, van Heumen, Cuijpers, & Juola, 2012) and large (Patterson & Bitgood, 1988) devices or objects. The contrary of the above mentioned characteristics (static, soundless, and small) will not or barely catch any attention at all. While looking at exhibits in exhibitions there are two factors which have a positive mutual connection with visitor attention, namely technological novelty and open endedness (Sandifer, 2003). In order to attract and hold the attention of visitors Borun and Dritsas (as cited in Sandifer, 2003) researched several characteristics for exhibitions. They identified seven characteristics to which an exhibition needs to suffice: 1) multisided 2) multiuser 3) accessible 4) multioutcome 5) multimodal 6) readable 7) relevant.

Besides the above mentioned characteristics it has also been identified by Jacucci et al. (2010) that there are seven participative strategies used in novel art installations. Namely: 1) enabling authorship 2) affording connectivity 3) interacting with artificial beings 4) reinterpreting the visitor world 5) engaging in performative acts 6) use of space 7) playing with materiality. Other ways to engage participants is to let them have freedom in where they want to put their attention to. Hemanson (1995) researched this

kind of exhibitions and came to the conclusion that the visitors' attention to an art installation was based on the curiosity. They also stated that this curiosity comes from the satisfaction the visitors got from processing something new and personal. This is in accordance with the research of Jacucci et al. (2010). Looking back it can be concluded that attention and participation are needed to create an attractive art installation. To summarize, in order to get attraction you first need attention. Various strategies to capture and hold attention have been presented in this review.

2.6.4 Measuring success of an art installation

After an art installation attracts passersby one would like to know the effect of the art installation. In order to do that there are several ways to measure the success. This chapter will review some of the ways to measure the success of an interactive art installation.

The main objective of an interactive art installation is to have many participants interact with the work, but Morrison, Mitchell, and Brereton (2007) assume that this is not necessary to make an interactive art installation successful. They explain that an art work is not made to please everybody and does not exist to convey one experience for everyone. It is already a good out-come if some participate and have a good experience. Capturing the passersby's attention is crucial in order to make an interactive art installation attractive. Measuring the attention of a passerby can be done by total time in the exhibition, percentage of the minimum time a visitor spends on an exhibition or the total stops which a visitor makes at installations, percentage of the total time in the exhibition spent at the exhibits, and total time spent at each exhibit (Sandifer, 2003). There are three measurements that measure the passersby attention: holding power, attracting power and average holding time. He defines holding power as the amount of time a passerby looks actively at something. Attracting power is described in his research as an indicator of selective attention and lastly, holding time is specified as the average time a passerby spends at the installation. Jensen (2006) affirms in her paper the definitions of attracting power and holding time.

Although holding power and average holding time may seem synonymous, Shettel (as cited in Sandifer 2003) and Sandifer(2003) distinguished these two by stating that holding time is the average time at an exhibit and holding power is a ratio between the time necessary to look at something and actually looking at the key objectives. Altogether, to measure passersby attention one needs holding power attracting power and holding time. Whenever the outcomes on these measurements are not positive one should rethink the method of capturing attention.

2.6.5 Conclusion

Now that several aspects of the process to create an interactive installation has been provided. This chapter will conclude the best way to create an interactive art installation. Many methods and frameworks have been made to design for experience and participation. It is a highly researched area within HCI. The research question for this literature review was: How to create an engaging interactive art installation? In order to answer this question the sub-questions need to be addressed first.

Experience consist of emotional response, attribution of meaning and aesthetic pleasure. The frameworks presented in this review correlate on the following aspect: user experience. Since the graduation project requires attraction and encouragement for interaction, the framework on spectator experience is of importance. So, the creation of an interactive art installation requires user experience and spectator experience. Both are very crucial and depend deeply on each other. Designing for experience can be done after the user-product relation has been set up to get a better insight in the users, context and activities. Errors can be easily spotted with both frameworks mentioned in this review.

As discussed, attention is necessary for attraction. Moving, sound-transmitting and large objects are common traits that capture the attention. Furthermore, seven characteristics have been found to capture and hold attention in inter-active art installations. However, art installations require also participation. Seven clear strategies which can improve the participation in interactive art installations have been presented in this review. To sum up, attention and participation are both important aspects for the attractiveness in art installations.

Measuring attention in interactive art installations is a good way to distinguish how attractive and popular your installation is. Holding power, Attracting power and average holding time are three statistical measures to indicate passersby's attention. Negative outcomes on these measures should give helpful insight for further improvements.

In conclusion, various strategies and frameworks have been proposed in this review which need to be taken into account to create an engaging interactive art installation. It is up to the creator of the interactive art installation which strategies and frameworks will be selected. Since each interactive art installation is unique and carries its own meaning. Nevertheless, importance should be given to capture the attention of passersby, holding it in order to initiate participation and provoke curiosity in passersby.

2.7 The implementation of non-human encouragement

In the following literature review Sjoerd Baarslag researches the implementation of non-human encouragement. As mentioned, the review will be summarized and briefly explained. The full literature review can be found in the thesis of Sjoerd Baarslag.

In this article Sjoerd Baarslag compared non-human encouragement with human encouragement. Several strategies were explored and discussed. He noticed that non-human encouragement has a big advantage over human encouragement, namely that non-human encouragement can be provided without limit. It is mainly used in phone apps as it is suggested by the literature found. It is advised that the following three tactics should be used: boosting competence, ignoring the start, and making the encouragement personal. The first tactic makes people believe that the task at hand is achievable. The second tactic is mostly used in smoke-quitting studies. The test group that did not focus on the starting process was proven to be more effective in both cases. The last tactic is personal encouragement. In several studies the test group that tailored the encouragement to the user was most successful, but the studies also suggested that there is a limit to the amount of information that is useful when it comes to tailoring. Sjoerd Baarslag mentions that far too little research was conducted that focuses on the best way to give non-human encouragement. He explains that the center of attention in many studies lies on the effectiveness of their product compared to a test without their product. The encouragement is seen as a little detail of the mentioned test and some of them even ignore it completely. He explains that the named statements in his paper are just suggestions, rather than a strong guideline. Non-human encouragement is starting to become very big in the healthcare, it is surprising that no further research has been done in this sector. In the future when there is a shortage of caretakers non-human encouragement is going to be very crucial. So he suggests that more effort is needed in order to get a good view of non-human encouragement strategies.

3. Ideation

After gathering background information this report continues with the ideation process of the installation. In this section creative concepts are formed for the envisioned product by using divergence and convergence techniques. To start with, the requirements for the installation are established and explained. Subsequently, different concepts are explored while keeping the requirements in mind are explored. Mockups are created to present these ideas to the client in an understandable way to diminish confusion. To conclude, the final concept will be chosen and further discussed.

3.1 Requirements

Before developing the concepts, a list of requirements made by Menperium should be examined. The concepts should meet most of the given requirements in order to achieve the best result. The list of requirements looks as follows:

The statue needs to...

- **Stand out in a company's reception hall.**
The statue needs to be the first thing someone sees. In this case a company's reception hall can be compared with hall B in Carré.
- **Attract the attention of people who have not seen it before.**
New visitors have to immediately get attracted to the statue.
- **Attract the attention of people who have seen it (multiple times) before.**
Employees who work daily at the company should still get intrigued by the statue even though they have seen the statue the day before.
- **Make people reflect on their personal goals and their vision for the future.**
The statue will have a deeper meaning which has to do with reaching personal goals. This should lead to people reflecting on personal goals and their vision of the future.
- **Be customizable for a company.**
Different themes have to be made in order to fit the represented company. For example, if the statue will be placed in a bank it should be corresponding with the bank's image and color palette.
- **Have the Menperium logo or star.**
Somewhere on the statue the Menperium logo has to be visible. People who are interested will now know the name of the company behind the statue.
- **Be portable.**
Somewhere on the statue handles or another element has to be placed so that the statue can be relocated more easily.

- **Be easy to disassemble.**

The design of the statue has to be made in such a way that components are easy to take apart, relocate and finally assemble again.

- **Be attractive.**

The requirement is pretty straight forward. The installation needs to be easy on the eyes.

- **Present motivational quotes.**

In a way the statue needs to show the motivational quotes. This can be done through a screen for example.

Menperium also included three requirements which are not necessary for the statue to have:

- The statue can be adaptable to certain circumstances.
- The statue can be interactive.
- The motivational quotes can be explained

The framework set by the requirements grants enough room for the creation of different concepts for the statue. The following part of the ideation phase will be an overview of several concepts which have been developed while keeping the requirements in mind.

3.2 Concepts

After analyzing the given requirements a brainstorm session was held in which new and original ideas were formed. The state of the art has been kept in mind while brainstorming for ideas. All examples given in the state of the art have been carefully analyzed and are used as an inspiration for our own ideas. Six ideas were chosen to be worked out in more detail and each one of them includes one or more requirements. In the following part of this paragraph six concepts are assessed based on originality, practicality and the amount of requirements which are met. Also, impracticalities are pointed out and suggestions for the respective problems are given.

3.2.1 Shape changing blob



Figure 3.2.1- Concept Shape changing blob

One of the requirements from Menperium is to keep the statue intriguing. This requirement is implemented in the following concept: Shape changing blob. This changing object as shown in figure 3.2.1 Consists of poles which are attached to the center and a canvas which covers the poles. While time passes the poles will move very slowly into a different position. At first sight it will not be visible, but after a few hours the placing of the installation is completely different. Because this installation only uses a few materials it will be fairly easy to reproduce and the costs would be low. This concept falls under the group Communication between art and environment.

The shape changing blob idea meets the following requirements:

- **Stand out in a company's reception hall.**
This installation will be colorful and large. For example, the canvas can be printed in many different saturated colors thus making it emerge from all the other objects in the reception hall. The installation will also be very big which is according to chapter 2 very important to make an object stand out.
- **Attract the attention of people who have not seen it before.**
The first thing that people who walk into the reception hall will notice is the size of the object. As stated in the literature review, big objects attract the attention of people.
- **Attract the attention of people who have seen it (multiple times) before.**
The size is not the only thing that will attract the attention of employees. Over time this installation will change into a different position which will catch the eye of people who have already seen the installation.
- **Be customizable for a company.**
Because of the fact that this concept is very simple and has a big canvas to work with it will be quite easy to customize this installation to the needs of every company. For example, the company's logo could be printed on the canvas or the color of the canvas could match with the color palette of the company.
- **Have the Menperium logo or star.**
As mentioned above the logo of every company can be printed on the big canvas.
- **Be easy to disassemble and portable.**
The design of the blob is not too difficult. It consist of a big canvas and a mechanism with poles attached to it. The canvas will be fairly easy to take off which also applies for the poles. Since the installation is very easy to disassemble the parts will small and portable.
- **Be attractive.**
The blob is at first sight not the most attractive installation, but the simplicity makes the concept very unique.

However, the presented concept does not comply with two requirements, namely:

- **Make people reflect on their personal goals and their vision for the future.**
The changing blob idea does not have any hidden motivational meaning. There is no element which makes people think about their personal goals and vision for the future.
- **Present motivational quotes.**
There is no display included which shows the motivational quotes. It is also fairly difficult to integrate the display on a constant moving surface.

All in all, the shape changing blob idea is a unique and rather simple idea. Despite all the met requirements two of the ten are not included. The motivational aspect is completely left out which makes the installation meaningless for potential viewers and the client.

3.2.2 Pie idea

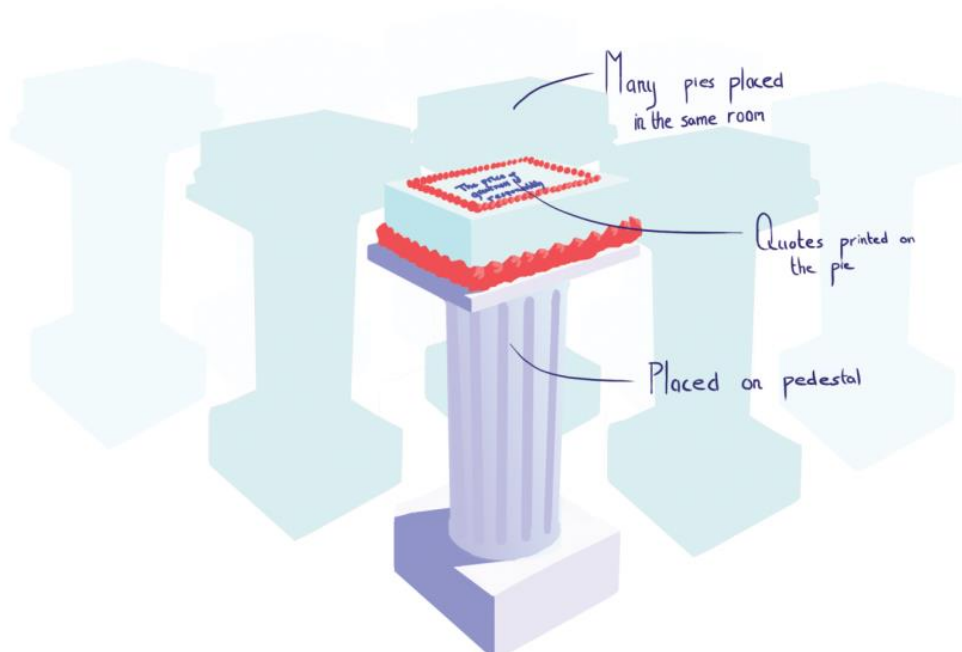


Figure 3.2.2- Concept pie idea

The next concept is the Pie idea. Several pies are placed on pedestals which occupy a particular room. These pies are decorated with different motivational quotes. The meaning behind this idea is that motivation is nice for a while, but it will not last long. Motivation needs to be refilled and in this case replaced with a new cake. The downside to this concept is the amount of pies which need to be replaced after a few days. Pies get moldy and the sight of a moldy pie is not appealing to anyone. A possibility to improve this concept is by replacing the pies with fake silicon imitations, but by using fake pies the whole meaning

behind the installation will be gone. Pie idea can be grouped with art installation with a deeper meaning. There is not a good resemblance with any of the installations in the Related work section. This idea is very simple and does not require any technological system of any sort. Next, the requirements which are met and those which are not are listed below with further explanation:

- **Stand out in a company's reception hall.**
The pie idea will stand out in a reception hall, because of its rather unique setup. It is not very often that many pies are placed on pedestals and should represent an idea.
- **Attract the attention of people who have not seen it before.**
People who will walk in a company's reception hall will definitely be caught off guard by such a big setup of pies and pedestals. It will be a delicious first sight which will leave many questions behind.
- **Be customizable for a company.**
The pies and pedestals can be ordered to be different colors including the colors of the company. Further small customizations can be made afterwards.
- **Have the Menperium logo or star.**
The Menperium logo can be placed on the pies or pedestals. There is enough surface which is visible for viewers and passersby in order to see the logo.
- **Be easy to disassemble.**
The whole setup consists of pies and pedestals which are easily taken apart from each other. The downside is that there are many of both elements.
- **Be attractive.**
The whole setup is quite unusual. A few rows of pedestals with pies on top will make the environment an attractive place to pass by.
- **Present motivational quotes.**
The pies will be used as display surfaces for the many motivational quotes. There is no screen needed to do so.

Even though seven of the requirements are present in the idea, the following are not:

- **Attract the attention of people who have seen it (multiple times) before.**
The pie idea is for the first time something that is funny and unique, but after looking at it for the first time the unique view of the setup will be gone. There is no element which makes it interesting for people who have already seen it before, to come back and have a look at it again.
- **Make people reflect on their personal goals and their vision for the future.**
Another requirement which is not added to the concept is making people reflect. The pies do have quotes, but this will not be enough to make people think about

their vision for the future. The original idea behind the installation is that motivation is available for a short period of time, but decays in the long run. This is quite far-fetched and will definitely not help in accomplishing this requirement.

- Be portable.

Because of the many pies and pedestals it will not be an easy task to install this installation in any reception hall. A lot of moving equipment is needed to replace the installation from one location to another.

The idea meets seven out of ten requirements which is not enough to be made into a real installation. It is a quite refreshing and good looking idea for another occasion. The concept has no aspect which makes people reflect on their personal goals and their vision for the future. Also, it has to be noted that there are no technological systems involved which makes this idea not suitable for this graduation project.

3.2.3 Shooting balls

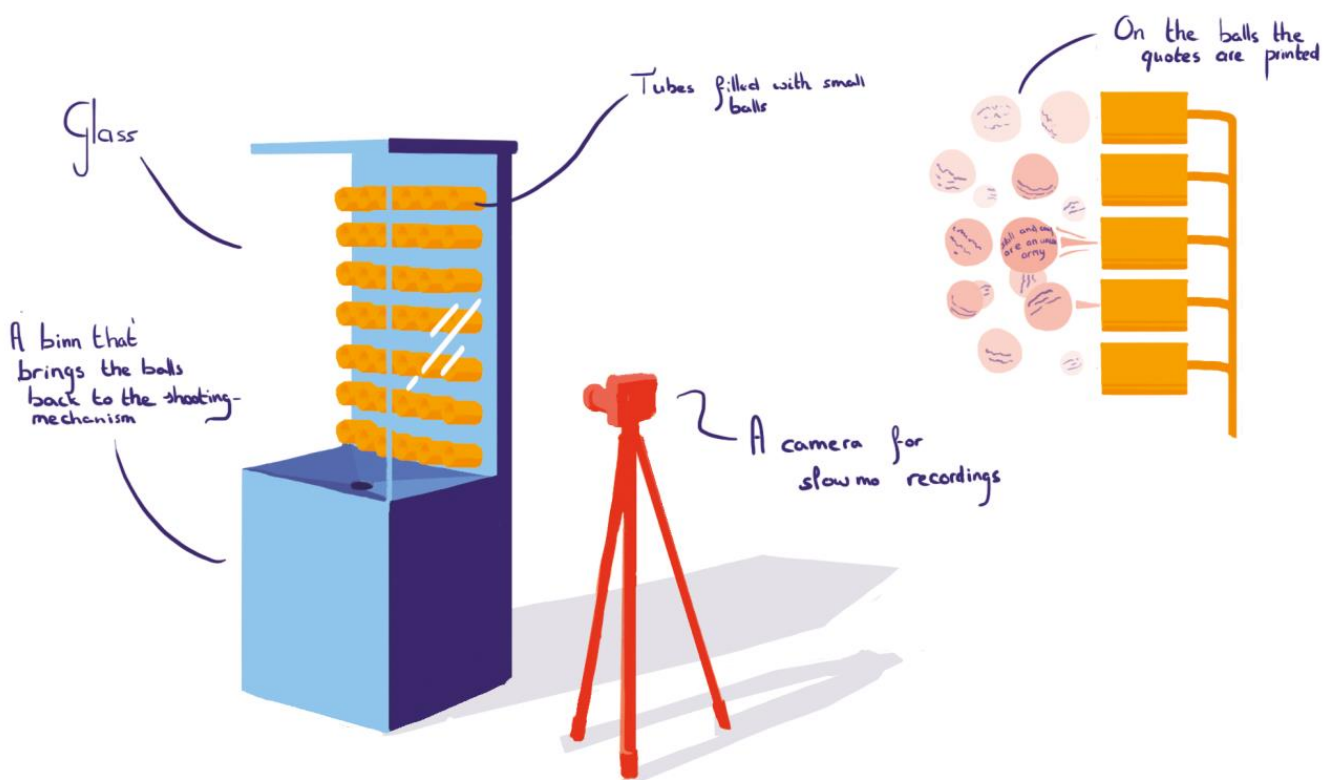


Figure 3.2.3-Concept shooting balls idea

As seen in the figure above this installation consist of a camera and a case with shooting balls. The case has tubes filled with small balls. Motivational quotes are printed on these balls and fired from the tubes by a shooting mechanism. The balls hit a glass plate with the words “Come closer” on it. Whenever someone comes within a certain range from the glass

plate a sensor within the installation triggers the shooting system to shoot balls. The purpose is to let people get startled by the sudden fired balls that will hit the glass plate. Next to the shooting bin a camera is placed which makes slow motion recordings of the balls with quotes and the startled people. A small video is made and displayed on a screen.

- **Stand out in a company's reception hall.**

The bin with the shooting mechanism and camera will stand out in a company's reception hall. The colors can be adjusted to increase the prominence of the setup.

- **Attract the attention of people who have not seen it before.**

This concept has an interesting element of surprise. Viewers who try the installation for the first time will have a very unique and bewildered moment.

- **Be customizable for a company.**

The colors can be adjusted to the likes of the respective company.

- **Have the Menperium logo or star.**

On the side of the bin the company's logo can be placed. Even on every little ball the logo or signature symbol can be printed.

- **Be portable.**

The bin will be easy to replace, because of its shape. Holes can be made in the sides of the installation for a better grasp while carrying the bin over a short distance.

- **Be attractive.**

One of the impressive things of this concept will be the shooting mechanism. It will be nice to look at and it will make the overall of the installation attractive.

- **Present motivational quotes.**

As mentioned in the description of the idea the motivational quotes will be printed on the balls. This is a very unique way to display the quotes without using a screen.

The following requirements are not met:

- **Attract the attention of people who have seen it before.**

This installation has an element of surprise build into it which is very entertaining, but it will only be a surprise for the first time. People who have seen what the shooting bin does will not visit it again.

- **Make people reflect on their personal goals and their vision for the future.**

When interacting with this idea people will not get the feeling of reflecting on their goals and future. There is no aspect that makes them want to do so. The motivational quotes are written on the ball, but this alone will not trigger people to think about their goals and future.

- Be easy to disassemble.

The initial idea is not able to be taken apart. The glass plate will be glued nicely into the bin. The shooting mechanism will also be fastened into the bin in order to make the whole setup more secure. The balls however can be carried around in another bag.

Unfortunately, this concept does not meet with all ten of the requirements. The shooting ball idea will not be that entertaining anymore if you have already seen it. Just as the previous concepts this idea does not have elements which make people rethink their goals and future visions. And lastly, the shooting bin is not easy to disassemble and has to be relocated in its current state.

3.2.4 Rope idea

The following concept is called the Rope idea. A considerable amount of rope is attached to a chain on top of the board. This chain of ropes will be as long as the longest quote provided by Menperium. Every rope is colored at specific parts which is represented by the black squares in figure 3.2.4. The chain on top of the board will be controlled by a program that makes every rope move from the top to the bottom and eventually behind the board (the direction of the arrow in the concept drawing). In the concept drawing each letter consist of three ropes. The ropes will start at the top again after moving around the whole board. The colored parts will form in the middle of the board motivational quotes. Elements like the operating system is what makes this idea very difficult and hard to achieve in the given time span. There is too much rope to control and especially if the board needs to fit the longest quote. An alternative to the ropes would be a system with marbles which will be described in the following part of this section.

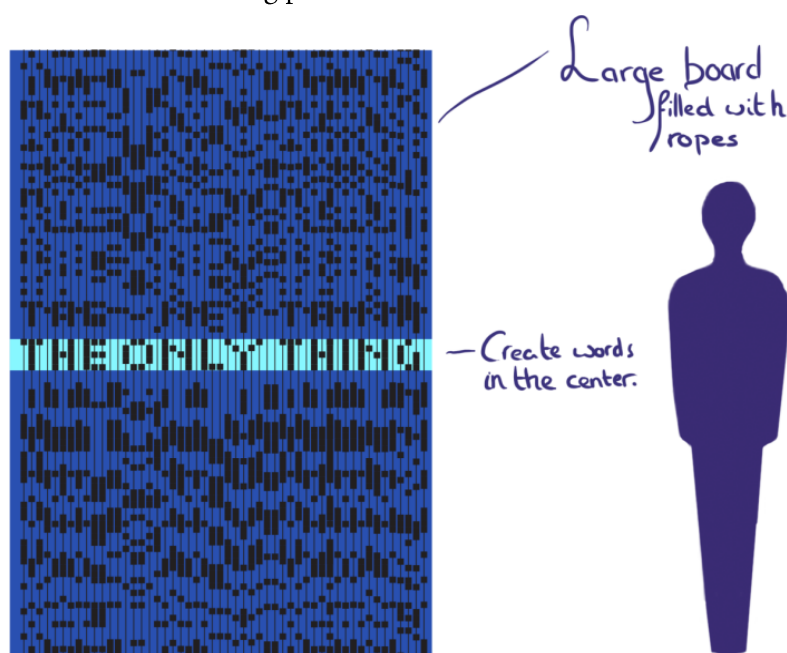


Figure 3.2.4- Concept rope idea

- **Stand out in a company's reception hall.**
The element which makes this idea stand out is the use of rope as a display for the motivational quotes. The ropes will turn around and show a quote at a time. It is very unusual for a reception hall to have ropes at their walls.
- **Attract the attention of people who have not seen it before.**
When new visitors walk into the reception hall their attention will immediately be attracted by the ropes and the quotes which are formed by the colored parts. As described above it is very unusual to have ropes hanging from your walls.
- **Attract the attention of people who have seen it (multiple times) before.**
The quotes shown at the middle part of the ropes will have a different quote after a certain amount of time. This will keep the installation interesting for people who have and who have not seen the installation before.
- **Have the Menperium logo or star.**
Because of the limited space on the ropes it will be difficult to place the Menperium logo or star on the installation. However, there is a small amount of space on the case around the chain. The logo has to be narrow in order to fit on it.
- **Be attractive.**
The amount of ropes give together a very interesting look in the reception hall. The ropes have painted sections which give the overall installation an unique effect and makes every reception hall more attractive.
- **Present motivational quotes.**
As presented in the description the installation will show the motivational quotes on the middle part of the ropes.

Just like the previous concept the rope idea did not meet with several requirements.

- **Make people reflect on their personal goals and their vision for the future.**
The rope idea does have motivational quotes, but this alone will not help in making people think about their goals.
- **Be customizable for a company.**
Unfortunately, there is no surface for the installation to be customizable for a company. Changing the colors of the ropes would take off the charm of the ropes.
- **Be easy to disassemble.**
This concept is one of the most difficult to disassemble. The ropes are all attached to the chain and it would be a hassle to take them all of individually and attach them again later.

Just like the concepts above, the installation does not meet all the given requirements. This concept, just like the shooting balls idea, does not trigger a train of thoughts about future

visions and goals. This requirement is very important and should definitely be incorporated in the final product.

3.2.5 Marbles

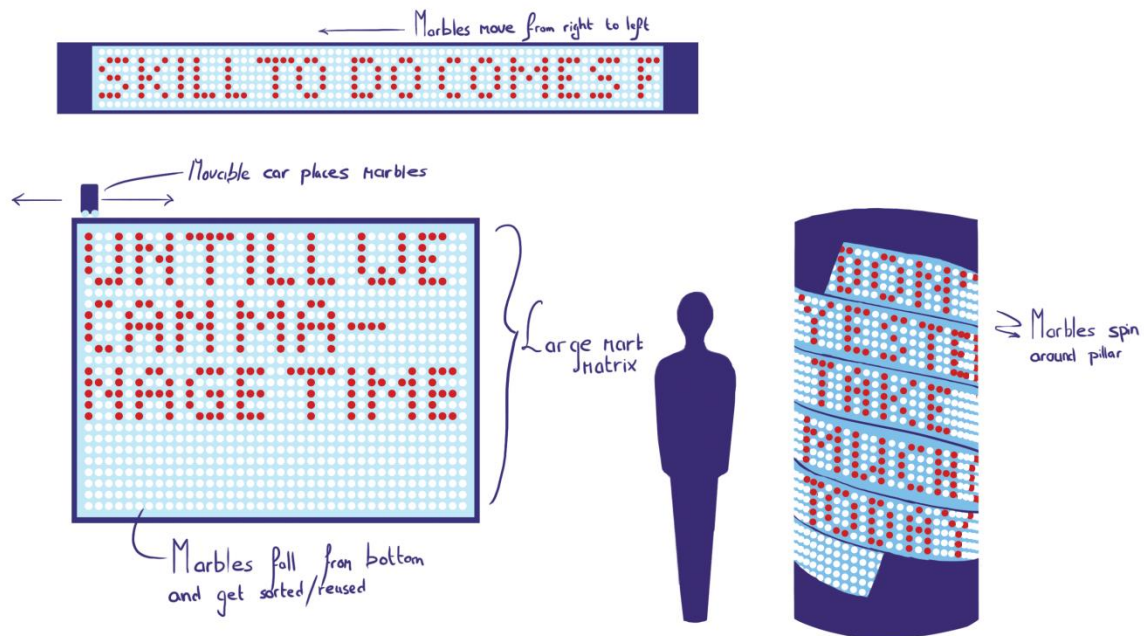


Figure 3.2.5- Concept marbles

The last concept of this brainstorm session was the Marble idea. As mentioned earlier this idea is quite similar as the Rope idea. A matrix made out of wood will have little compartments where one marble at a time will be placed. At the top of this matrix a marble cart will be fixed. This cart will move to the left and right and drop one marble each time. After an amount of time the matrix will be filled with red and white marbles. The red marbles will form together a motivational quote which will be displayed for some time. When the quote has been displayed for a big amount of time a hatch at the bottom of the matrix will open and all the marbles will fall into a compartment. The red and white marbles will be sorted by color and put into the marble cart again for use. This idea had

- **Stand out in a company's reception hall.**

This big marble matrix will stand out in any room. The size alone is already a big eye catcher. The amount of moving marbles will also make the concept stand out more.

- **Attract the attention of people who have not seen it before.**

As stated in the previous point, the size and amount of marbles make the

installation stand out. This will lead to attracting the attention of people who have not seen it before.

- **Attract the attention of people who have seen it (multiple times) before.**
Just like the rope idea, the quotes will change after a certain amount of time. This will attract the attention of people who have seen it before. Every time Someone walks past the installation they will see a new quote and take it with them.
- **Have the Menperium logo or star.**
This concept does not have any place for a big logo. There is space however, in the cart with marbles. The logo could be printed there. This is probably not what our clients have in mind.
- **Be attractive.**
The installation is very attractive thanks to the various moving and colorful marbles. As seen in the concept drawing the matrix could also be turned around a big pillar.
- **Present motivational quotes.**
In a way the statue needs to show the motivational quotes. This can be done through a screen.

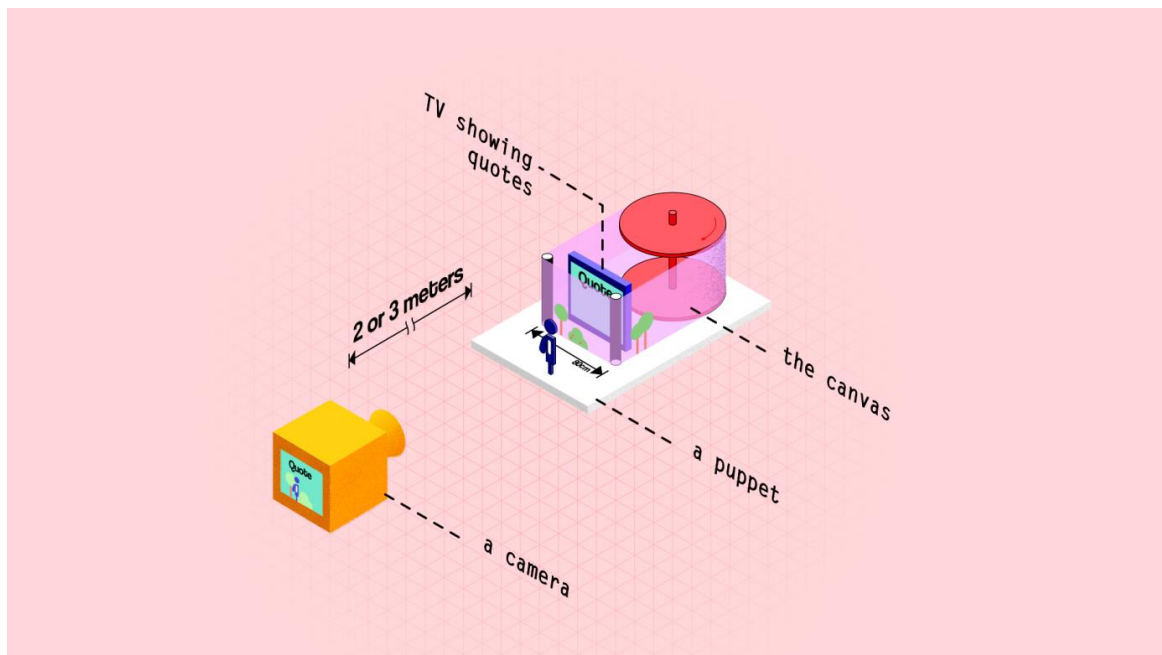
Regrettably, the second to last concept was also not chosen, because of the following requirements it did not meet:

- **Make people reflect on their personal goals and their vision for the future.**
Just the like previous concepts, the marble idea does not have any depth to it. This idea is another way to display the quotes in a pretty way.
- **Be customizable for a company.**
The only elements in this concept are marbles and a marble cart. Making different themes which fit with the represented company will be difficult to not possible.
- **Be portable.**
The marble matrix will be as long as the longest quotes and needs to fit on a wall. Such a big element will not be easy to relocate.
- **Be easy to disassemble.**
The marble idea will only consist of one element, the marble matrix. This matrix will not be able to be disassembled.

This idea was not chosen because not all requirements were met. Also, making this installation in the short amount of time given will not be possible. The difficulty of this idea is far too high and will require more than 8 weeks.

3.2.6 Stop motion

The last concept of this brainstorm session will be called the stop motion idea. The installation consist of several elements. One of them is the moving background which is made on canvas. This canvas is turning slowly around a very big gear which does not stop. The next element in this installation is the television. It is placed between the gear and the canvas and shows the motivational quotes. In front of the plastic sheet and television a little puppet is fixed. This puppet will move his legs and arms at a slow pace as if he/she is walking. As shown in figure 3.2.6 a camera is pointed towards the installation. This is not a regular camera, because what is seen on the picture is just a casing for a real camera and a little screen. The camera will be making photos after a certain amount of time. A program especially designed for this installation will put all the photos in a little video. This video will then be shown on the little screen. At first glance it does not look as if the installation is moving at all, but when looking at the screen the installation is coming to life. The meaning behind the stop motion video is that as a person you should not look at your



progress over a short period of time, in fact you should look at your improvements over a longer duration of time.

This concept meets the following requirements:

- **Stand out in a company's reception hall.**
The installation will be quite big and use a big amount of space. As shown in the related work big installations do always stand out. The set-up of the installation is also very unique and makes it stand out more.
- **Attract the attention of people who have not seen it before.**
As mentioned in the literature review, a big and moving object will attract the attention of new passersby. The almost motionless installation is in contrast with

the moving animation shown on screen in the camera casing. This contrast in movement should attract people who have not seen it before.

- **Attract the attention of people who have seen it (multiple times) before.**
The installation appears not to be moving when looking at it for a few minutes. Employees who are leaving for the day will definitely pass the reception hall again. This is when they will notice that the installation is not motionless. A new spark of interest will be triggered this way.
- **Make people reflect on their personal goals and their vision for the future.**
A good way to make people reflect is designing the background as a dreamy meadow. The puppet is in this case a traveler who is travelling towards his/her destination (goal). The objective then is to make the viewers relate with the traveler and think about his/her own personal goals and how to achieve it.
- **Be customizable for a company.**
It is possible to customize this concept for a specific company. If the company is a bank the puppet could for example look like a banker walking in a city with high buildings. The puppet, the background and the colors which should represent the company are customizable
- **Have the Menperium logo or star.**
The Menperium logo can be placed on the side of the camera casing or on the pedestal under the puppet and television. The size or star of the logo can be discussed in a later stadium.
- **Be portable.**
On the pedestal a few handles can be placed which makes carrying the installation easier. These handles could also be holes in the pedestal where you can put your hand in for better grip
- **Be easy to disassemble.**
The installation can be disassembled in a few parts. The first part being the puppet and its mechanism. The second part which can be taken apart is the television and the last part being the pedestal. Every component will be not heavy and not easy to carry.
- **Be attractive.**
All elements in this concept are very unique and the materials which is going to be used are also out of the ordinary. The whole installation will be very attractive.
- **Present motivational quotes.**
The television will be showing motivational quotes. After an amount of time the quote will change into another one.

As seen above all requirements are met. The discussion on this concept can be found in the next paragraph.

3.3 Discussion on chosen concept

After the first brainstorm session a meeting was held with Menperium. All six concepts were presented and reviewed. New insights were gained and thus a second brainstorm session was planned. Menperium gave us feedback on the concepts and chose their favorite idea. In this final session the stop motion idea was chosen to be further executed. The first stop motion concept met every requirement given which is one of the reasons why this idea is chosen. Other reasons are creativity, originality and manufacturability. In the next few pages the idea will be developed further by looking at it more critically. Design decisions will be made and explained which will ultimately lead to the final concept.

As mentioned earlier, Menperium indicated that the stop motion idea was also their favorite. Some changes needed to be made for this idea to work. In this paragraph several choices are made in order to make the idea more concrete and more attractive.

3.3.1. Theme

There are many possibilities concerning the theme of this concept. The background, puppet, pedestal and program on the television can be designed in many ways. We know that the installation will be put in hall B at the University of Twente and after some exposure the installation will be taken by Menperium. So the theme should be neutral and relatable for everyone. The first thing that came to mind was a meadow with a traveler. Everyone has travelled once or twice in their lives and probably enjoyed it. The traveler is supposed to walk towards his final destination which is unknown. The goal is for the passersby to think about their own goals and destinations in life while getting motivated by the quotes on the screen.

3.3.2 Art style

The theme of the installation which is a dreamy meadow has been established in the previous paragraph. The next thing to decided is the art style of the landscape. It has to show a certain amount of detail, but it should not be too time consuming. Several examples of different art styles have been looked up and examined. In order to get the desired style some sketches were made. These sketches helped to narrow down all the possibilities available. The first found art styles were quite realistic and would enhance the 3d effect of the stop motion animation. Shadows, textures and extra lighting can be added to make the landscape more lively and realistic. Figure 3.3.1.1 is a good example of the style which is described earlier. Another possibility on the other side of this spectrum is minimalistic design. Using only a variety of vector shapes would already make a very appealing design. A few examples can be seen in figure 3.3.1.2 and 3.3.1.3. As shown the designs use only clean



Figure 3.3.1.1- Stopmotion by Heather Colbert

lines and shapes to illustrate mountains, trees and cabins. The last art style which was explored is a style which lies between both styles mentioned above. This art style will also be the starting point for our final landscape design. Figure 3.3.1.4 is the final example of the explored art styles. It shows flat shapes, but also quite an amount of detail. The mountains are built up from three colors instead of two. This little change already gives more depth in the design.

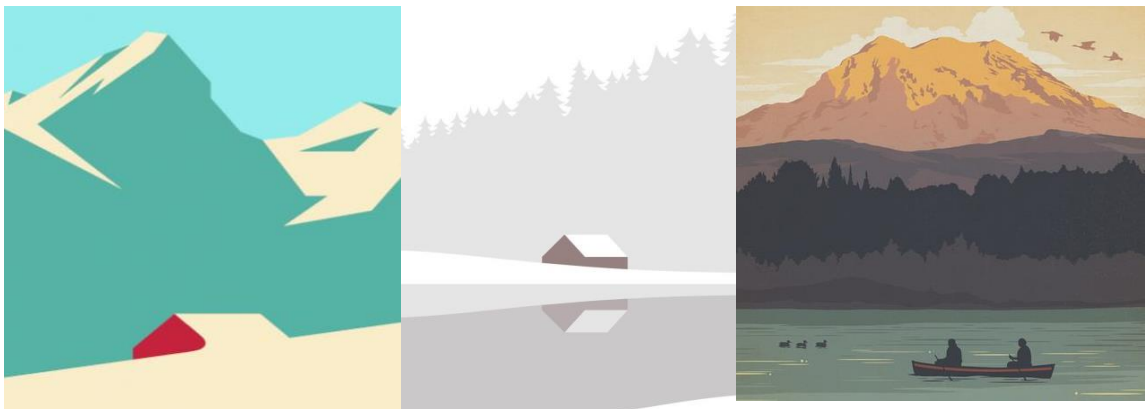


Figure 3.3.1.2, 3.3.1.3 and 3.3.1.4- Winter and by Heyshop, Mount rainier by Anderson Design Group

As a final point, some sketches were made using the semi-flat art style. Some elements from the dreamy meadow are used to see how this style would look like with the chosen theme. The sketches can be found in figure 3.3.1.5



Figure 3.3.1.5 Concepts for background

3.3.3 Camera

Another very important key element of the installation is the camera casing. An attractive way to hide the real camera and screen is in a big old-fashioned camera from 1920. In figure 3.3.1.6 such a camera is shown. There should be enough space to place both elements while leaving space for remaining cables. In the initial design a cloak was going to block the sight of the screen as seen in figure 3.3.1.6. This way the attention of passersby should be caught. Unfortunately, Menperium was not fond of the idea and the cloak had to be removed from the concept. The casing should stand on a pedestal which can be adjusted. Small details as shown in figure 3.3.1.7 are not necessary, but would definitely help make the case look real.



Figure 3.3.1.6 and 3.3.1.7- Old fashioned camera

3.3.4 Chain

In the initial concept the landscape would be printed, painted or glued onto one plastic sheet. There are two aspects of this idea which did not appeal to us, namely:

- A plastic sheet would be very hard to work with. It can bend, fold and roll in wrong directions.
- One sheet would not give a very nice effect in the stop motion video. The goal of the stop motion video is to have a slight 3d effect.

Some research was done into finding the mentioned material, but the outcome of the research was negative. The price of a big transparent plastic sheet was too expensive and especially if there would be two. A cheap alternative would be plastic foil, however it was discarded immediately. The thought of working with this material did not appeal to us at all. A cheap and strong alternative was thus needed which was eventually found. In figure 3.3.1. a photo of a lasercutted chain is provided. The initial idea for this chain was to work as a cable for Lasercutters. This new solution solved the problem of reluctant bending, folding and rolling of the landscape.



Figure 3.3.1- Wooden chain

3.3.6 Puppet

Continuing, the puppet should have the same art style as the other key components. The traveler's outfit was inspired on several examples of real life travelers. While designing the puppet a few things had to be kept in mind:

- The puppet has to look well prepared which means that the luggage or rucksack have to be well visible.
- The puppet has to look confident. This is visible by the gestures and pose of the puppet

As seen in in figure 3.3.6.1 and 3.3.6.2 all designs have a rucksack and extra accessories.



Figure 3.3.6.1- first iteration puppet

The first figure shows the first designs of the puppet. The most left design was too dark for our liking. That is why the second and third design were made with lighter colors. A more convincing feeling came from this design, however it did not look complete. The female puppet's design does not look confident enough. The clothes and hat do not give the feeling as if she is traveling for a great distant.

A second batch of designs were made after discussing the first one. The clothes have been changed to a somewhat more sportive outfit which is more convincing than the previous one. The female design has more accessories like a camera, water bottle and walking stick. By way of contrast, it should be even better if the puppet would have an unexpected design. As viewer you would expect a long journey to be made by a young person, but the older generation are also able to go on a similar journey toward their personal goals. All in all we choose figure 3.3.6.3 to be the final design for our puppet.



Figure 3.3.6.2- second iteration puppet



Figure 3.3.6.3- Final design

3.3.7 Screen for motivational quotes

The television screen is going to run a program especially made for this project. The program will show the motivational quotes as discussed earlier. It will also show a sky with passing clouds. The sky must be blue with a changeover to another color. For example orange or purple. The program should be adjustable while running. The speed of the clouds and the changeover have to be customizable, because at this point we do not know how slow the puppet and chain will go.

3.3.8 Pedestal

Several ideas for the pedestal are shown in the next images. When we have enough time the pedestal will become something very elegant. Some ideas for this pedestal could be mirrors on the sides where you can see yourself. This could also be a good reminder that you have to think about your personal goals while looking at the installation.

3.3.9 Final setup

In the last section of this chapter a mockup of the final setup is created in order to prevent confusion. The most important change between the final setup and its predecessor is the position of the gears that are going to move the background. The fact that the installation should be big was already established in paragraph 3.3.1. The installation should be big enough to carry a television screen and two chains with landscapes on it. The big pink gear in figure 3.2.6 is located behind the television thus making the installation too big for one's liking. If the previous setup would have been executed the pink gear would be enormous and very overwhelming. The attention would be drawn away from the camera and puppet which are the key components of the installation. Hence, a new solution had to be devised. As seen in figure 3.3.2 four gears are put next to each other closely around the television. This way the gears do not have to be that large therefore making the pedestal shorter. The size of the whole installation will be reduced this way. The pedestal will be a big case which has the drive mechanism for the rotating gears installed within. After getting feedback from Menperium they indicated that the cloak around the camera would prevent passersby from looking at the screen. They did not want to risk this. For this reason the idea of the camera casing stayed the same.

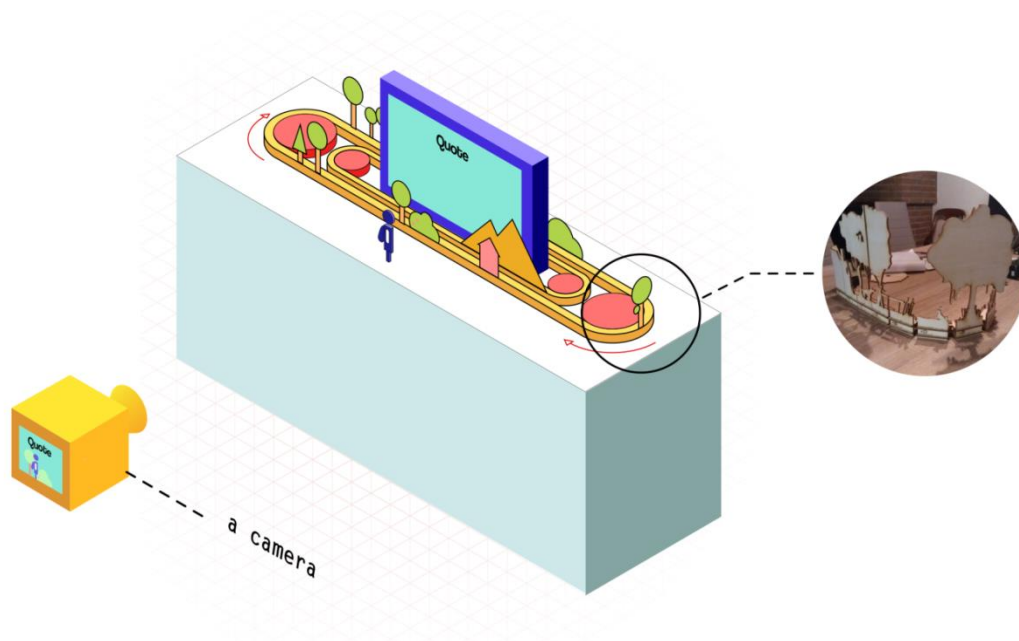


Figure 3.3.2- final setup

4. Specification

After exploring many possibilities for our final concept design choices have been made. The specification phase of this graduation project will go further on the ideation phase. The choices and the defined setup in the previous chapter are further elaborated in the following paragraphs. Rapid prototypes of key elements are made and discussed.

4.1 Component specification

At this part of the project all the key components of the final setup were split up and divided between Sjoerd Baarslag and me. A variation of technical and lay-out assignments were created and assigned.

4.1.1 Landscape

One of the lay-out assignments was designing the landscape that would be glued on the chains. The art style and theme of the background were already settled in the ideation phase. The theme of the background should be a dreamy meadow with little villages and cows. Examples have been given in the corresponding paragraphs. Instead of using Adobe Illustrator cs6 to design the landscape, Photoshop cs6 has been used instead. The landscape is fully drawn by hand using a Wacom intuos pro tablet. A few things had to be kept in mind while drawing the landscape:

- The landscape should be drawn on two separate layers, namely the foreground and the background.
- Both ends of the drawing should be identical and form a loop.

In Photoshop two layers were created to draw the foreground (the little villages, hills and cows) and the background (the mountains) of the landscape. The purpose of these separate layers is that there are two chains that need to be fully covered. Screenshots of the two separate layers can be seen in figure 4.1.1.1 and 4.1.1.2. The foreground layer is 440 cm wide and the background layer is 278 cm wide. Looking at figure 4.1.1.1 it is visible that the colors are transitioning from warmer colors (left) to colder ones (right). This should create a very nice effect in the stop motion video. Both ends of the drawing start with water, because this was the easiest way to make a smooth and natural transition. The drawings were later printed on canvas which will be addressed in the realization phase.



Figure 4.1.1.1- Part of first layer



Figure 4.1.1.2- Second layer

4.1.2 Chains

A very important element in the installation are the chains which will hold the background. A design by Msraynford was found and some slight changes were made. He altered the individual chain pieces to 6 cm long and 3.5 cm wide. An extra hole was created in the back of every piece to allow the gear to hook into it. There also needed to be found a solution to put the background on the chain. The front part of the pieces would have 4 holes where the pieces of the background could later be fit onto. Figure 4.1.2.1 shows the described solution. A test where the chain and background were attached to each other was conducted and can be seen in figure 4.1.2.2. After estimating the space between the pieces the total length of both chains could be calculated. The outer chain would be 438 cm and the inner one 276 cm.

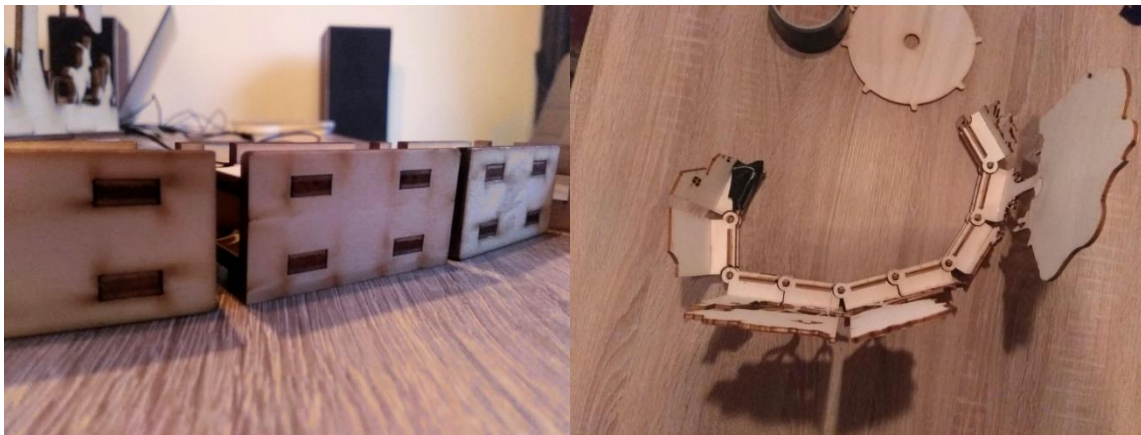


Figure 4.1.2.1 and 4.1.2.2- Chain with background

In order to separate the chain at one point a detaching mechanism was created. This way the chain does not require to be glued together and make it possible to revolve the chain around the gears later on. This is shown in figure 4.1.2.3.



Figure 4.1.2.3- Detaching mechanism

4.1.3 Pedestal

After estimating and calculating the sizes of the chains and individual pieces the design of the pedestal could be created. All the known measurements were put in the Adobe Illustrator to get a better overview of the final size of the installation. The sizes of the chain pieces were already decided and thus a good estimation of the margins on the sides could be guessed. The measurements of the television were taken and put into the same document. Ideally the chains should move around the television as close as possible in order to save some extra space and eventually material. The final top view of the pedestal can be seen in figure 4.1.3.1. The grey vertical squares indicate the wooden beams which are going to support the television. The red square on top of these grey beams is the space for the television. At this point in the project the size of the mechanism was still not defined so a big amount of space was estimated to put the mechanism for the automata in.

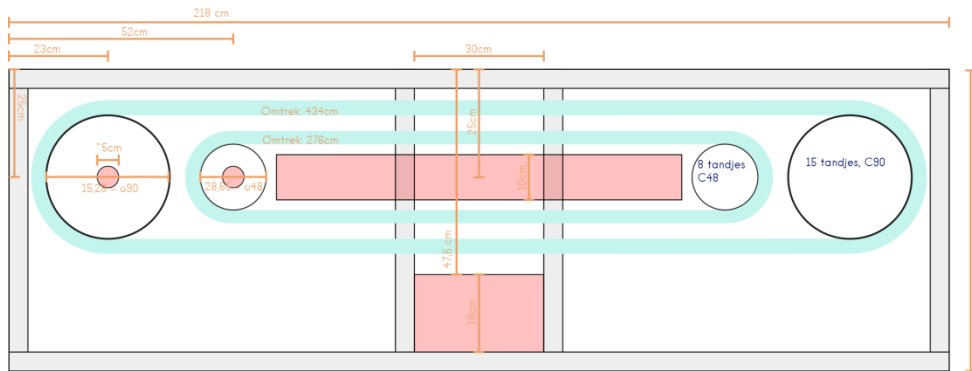


Figure 4.1.3.1- Top view of pedestal

The height of the pedestal was estimated to be 90 cm. The final design for the pedestal can be seen in 4.1.3.2. Materials which are going to be used for the pedestal are MDF plates and wooden beams from the Praxis. The thickness of the MDF plates have to be taken into account while designing the pedestal. The back of the pedestal will have detachable plates, because the mechanisms inside the pedestals have to be accessible at any time. At the back of the pedestal 8 hooks are drilled into the beams. The back plates consist of 8 holes where these hooks can get in.

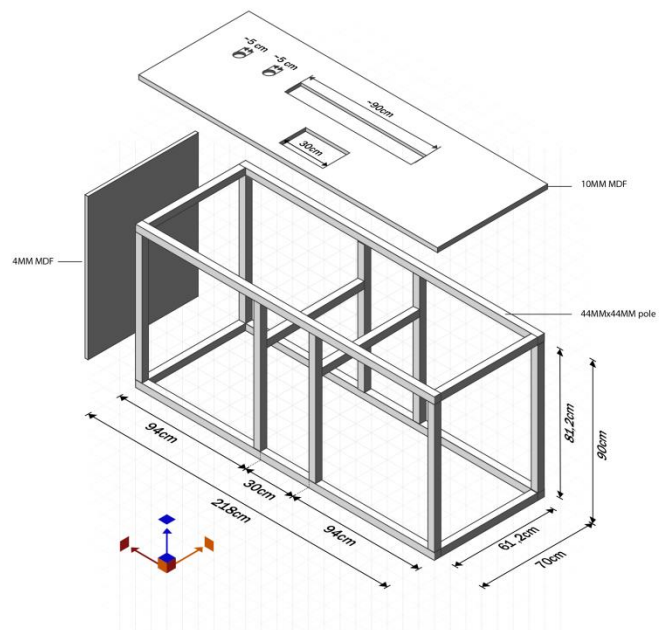


Figure 4.1.3.2- Final design pedestal

4.1.4 Automata

The design for the puppet is established so the following step would be to use the measurements of the television and pedestal to estimate the final size of the puppet. The height of the puppet will be between the 15 and 20 centimeters. Knowing this information research had to be done on how to move the joints of the puppet. While researching for a good solution the term automata came up. The definition of automata is a mechanical device made in imitation of a human being. A good example can be found in figure 4.1.4.1. Difficult rotating point like the neck, ankles, wrist and elbows were left out due to time shortage. The only rotating point in our automata will be at the knees and shoulders. After looking at various tutorials the program Linkage has been used in order to visualize and test the walking mechanism. Before starting with our mechanism another walking mechanism has been thoroughly examined and used as starting point. This mechanism is visualized in figure 4.1.4.2.



*Figure 4.1.4.1- Example
automata*

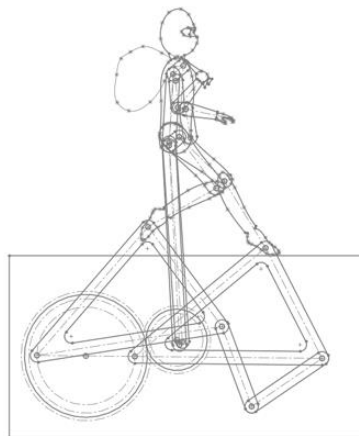


Figure 4.1.4.2- Walking thief automata

This thief like automata does not walk normally, instead he is silently tiptoeing. The upper body and arm move up and downwards which should not be incorporated in our mechanism. The only important element from this example is the setup of the gears and triangles that make the legs move. In Linkage a similar setup was created and tested. After some tweaking of the gears and positioning of the triangles a smooth and normal walking cycle was created. Figure 4.1.4.3 shows a screenshot of the program. The arm is fixed to the left gear where the motor will be attached. The pink gear will move the other direction of the first gear and thus bending and stretching the leg.

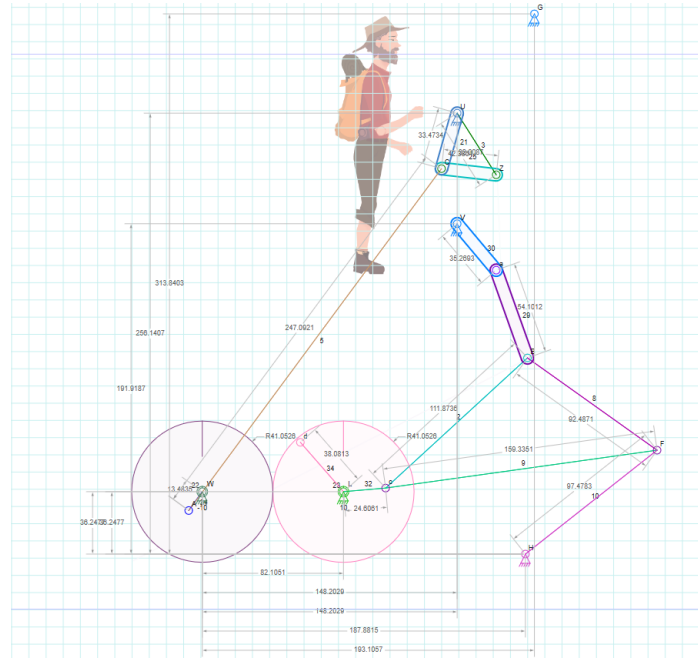


Figure 4.1.4.3- Mechanism in Linkage

After getting some feedback the mechanism was later recreated in Adobe Illustrator so that the parts could be lasercut.

4.1.5 Camera

The design of the camera casing would look like an old-fashioned camera from 1920. Because of lack of material the initial idea for the camera would look something like figure 4.1.5.1. the pedestal for the camera casing would be one pole with a box for laptops and cables on the ground. This design looks very unstable and not appealing. Some solutions to make the pedestal more stable would be putting tiles in the box and on top of that the laptop which runs the stop motion video.

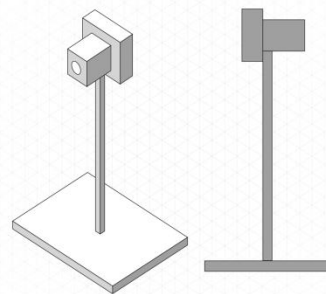


Figure 4.1.5.1- Initial camera design

After getting some feedback from Han Davina we changed the pedestal of the camera casing to a tripod. The dimensions and size of the tripod is shown in figure 4.1.5.2. This new idea is much more stable and attractive than the previous one.

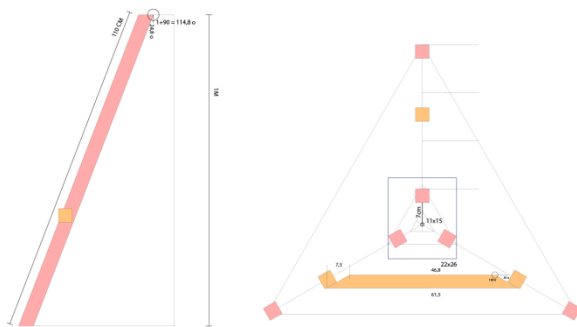


Figure 4.1.5.2- New tripod design

5. Realization

This chapter describes the realization of the envisioned product. Building upon the product specification a number of components will be realized and elaborated. Many photos have been taken to give a better understanding of the processes and results.

5.1 Component realization

In this paragraph the realization of almost all components will be discussed and progress photos will be given.

5.1.1 Making of the pedestal

Together with Sjoerd Baarslag the pedestal for the installation was built in the wood workshop in the Vrijhof. The whole process went very smooth and without any problems. The process of making the pedestal can be divided in three parts. The first part building the frame. The second part is placing the MDF plates and lastly painting the pedestal.

The frame is built according to the design in paragraph 4.1.3. The poles were cut in the correct lengths and then fastened together with nails. The frame was done in one day thanks to feedback from Dan Davina who runs the wood workshop. In figure 5.1.1.1 the finished frame is shown.

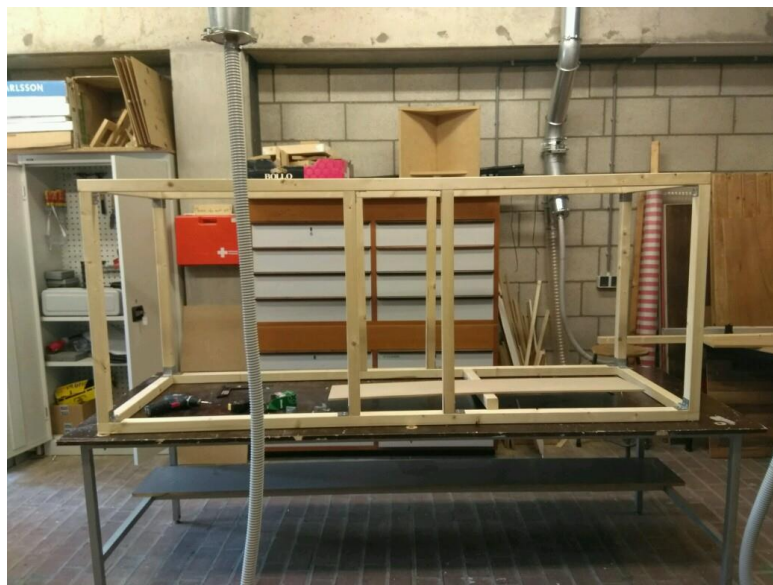


Figure 5.1.1.1- Wooden pedestal structure

After completing the frame MDF plates were placed on each side. The MDF plates were already cut to the correct lengths in the Praxis. Not long after that the holes for the automata and handles were pointed out and eventually cut out. The plates which were placed on the back had in total eight holes where little hooks would go in to keep them in place.

Lastly, the finished pedestal needed to be painted in the correct color. Dan Davina told us to first put a coating layer on the pedestal, because MDF plates would absorb the paint. We put two layers of white coating before we wanted to paint the pedestal in Prussian blue.

5.1.2 Printing out the landscape

First, the finished drawing needed to be prepared before lasercutting it out. A bleeding was added around the outline of both layers. This will prevent the laser cutter of cutting in the drawing. The image was later traced in illustrator. In figure 5.1.2.1 the bleeding around a part of the drawing is shown.

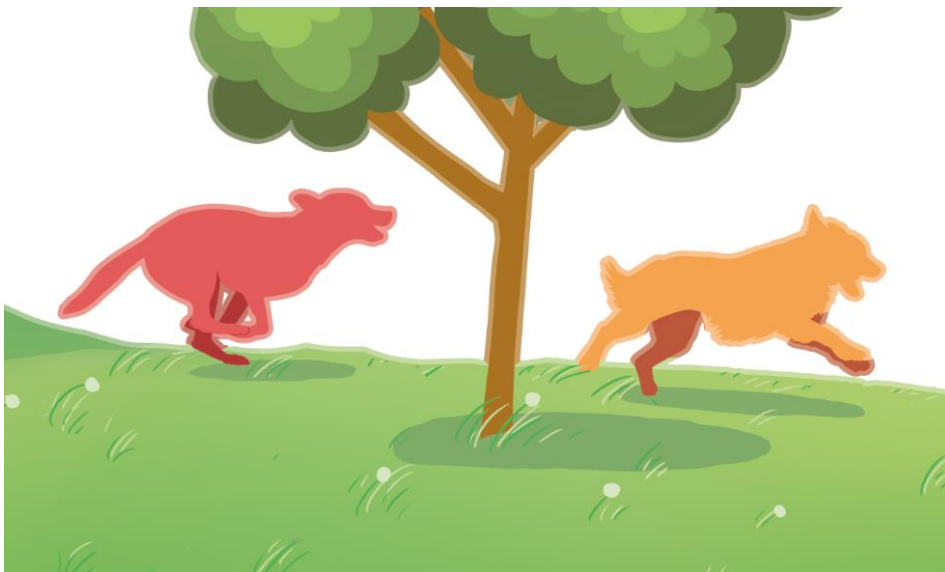


Figure 5.1.2.1- Bleeding around outline

The image was traced in illustrator, because the laser cutter is not able to read a png file. This way the cutter knew exactly where to cut on the plywood. After tracing the outline in illustrator both layers were separated in sections. Two things had to be accomplished by doing so. The first one being that the drawings have to be separated in sections as shown in figure 5.1.2.2. The other goal is to have vector shapes as seen in figure 5.1.2.3.

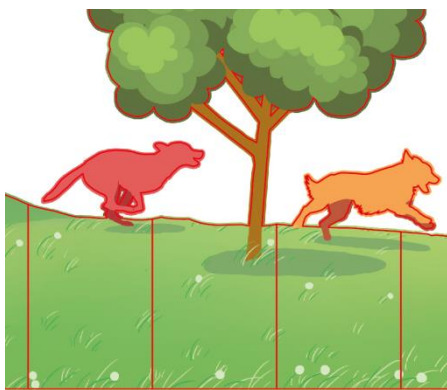


Figure 5.1.2.2- Traced sections

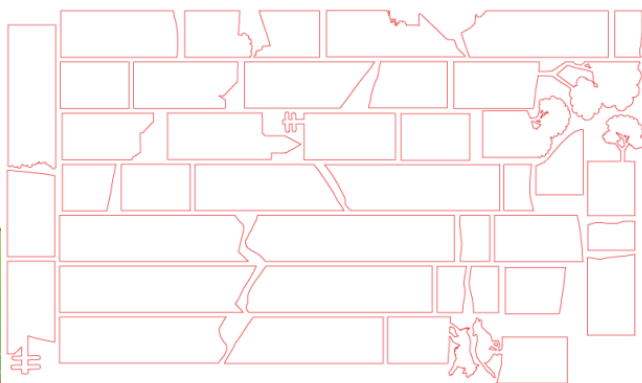


Figure 5.1.2.3- Vector shapes of outline

A file with all the drawing pieces was made ready to be printed. The file contained four sheets each 91x60 cm long which were going to be printed out later. The dimensions of the sheets were not randomly chosen. The width of the printer could be 137 cm or 91, it was chosen to use 91 cm because it was more cost efficient. The laser cutter could not cut plywood plates over 100x60 cm, thus leaving us with the final dimensions of the sheets. In figure 5.1.2.4 the file with sheets can be seen.

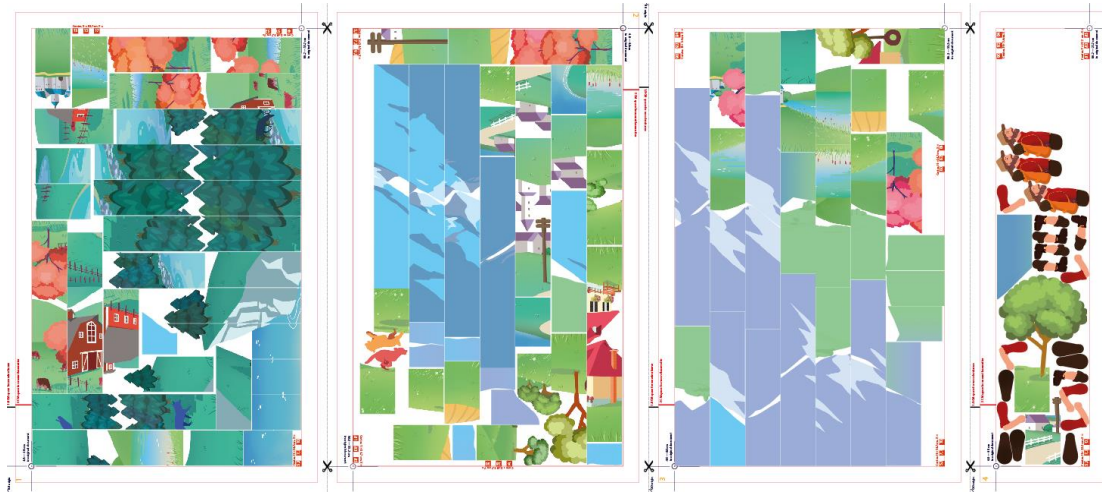


Figure 5.1.2.4- Final prints

The file was brought to the AKI to be printed. The final results of the prints were very promising although some slight color irregularities could be seen. The canvas that rolled out was 2 meters in length which is as discussed too big for the laser cutter. The canvas was then cut in four big sheets. The aligning of the sheets and the laser cutter went smoothly and precise. As already shown in figure 5.1.2.3 the vector shapes have also the same position as the sheets, so it was just a matter of fact of calibrating the shapes with the sheets. The process is shown in figure 5.1.2.5.



Figure 5.1.2.5- Lasercutter cutting the prints

5.1.3 Building the automata

Since the design for the automata could not be exported from linkage to Adobe Illustrator the design had to be duplicated in Illustrator manually. A few things had to be taken into account while duplicating the design. First of all the automata needed to have a case holding the automata upright in the pedestal. Second of all, the automata needs to have several layers in order to move his arms and legs without them every intersecting. In figure 5.1.3.1 the outline of the automata is seen with the position of the gears and triangle.

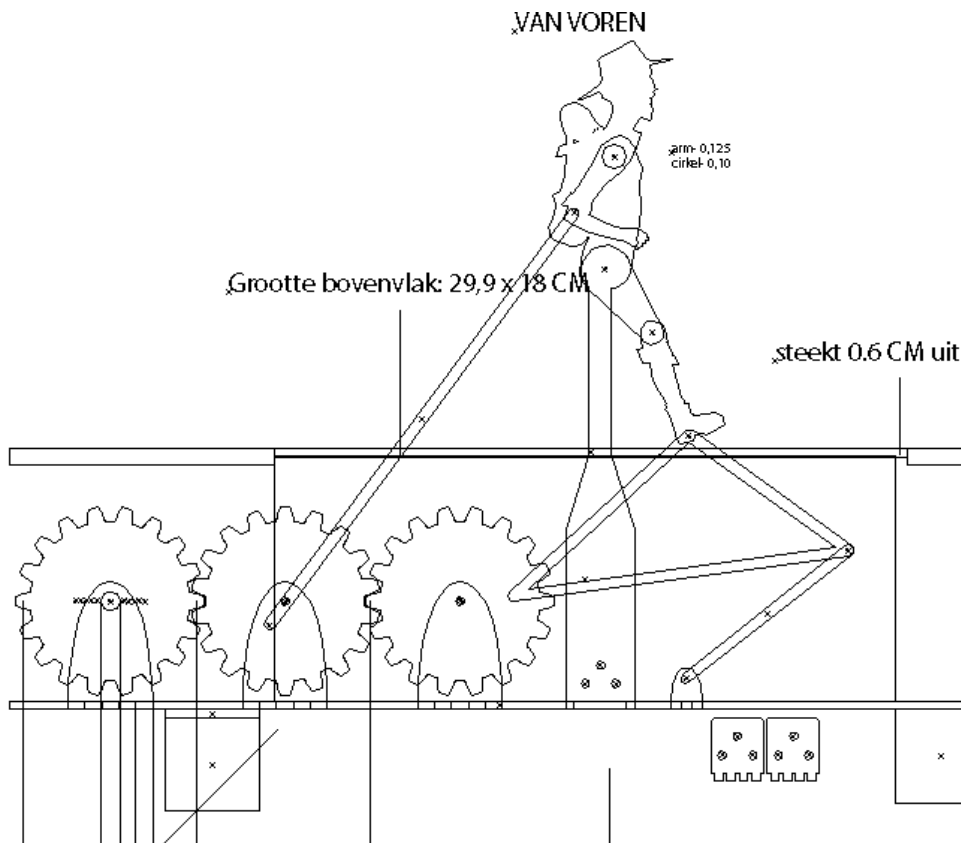


Figure 5.1.3.1- Side view of the automata and its mechanism in the pedestal

The case for the automata did not fit in the 30 x 18 x 12 cm space provided, because of the positions of the gears.

The joints are fastened with nails. In every piece little holes were made in order for the nails to fit in. Some hole however are smaller due to the fact that the nails will rotate in the bigger/looser holes and be fastened in the smaller ones. The smaller holes are mainly in the body and the pieces of wood between the limbs and body. The design was cut out, assembled and inspected for errors. Unfortunately, there were some few errors with the design. The first error was the position of the servo which did not fit into the casing. The holes in which the servo was supposed to be placed stood too close to the gear thus not allowing the gear to be put in place at all. Lastly, one knee stretched too much which led to

a weird angle when the leg would stretch. The strange angle of the leg can be seen in figure 5.1.3.3. These small errors were quickly fixed by adjusting some details. The canvas was printed by the time the final design for the automata was done. The wooden automata was painted in Prussian blue and the pieces of canvas were glued on top of this. The results is shown in figure 5.1.3.4.



Figure 5.1.3.2- Final automata in pedestal

5.1.4 Making of the camera

The tripod was build first. Building this part of the camera did not take long, because we already got quite some experience building the pedestal. Han Davina gave us the tip to use chains between the legs of the tripod in order to make it more sturdy. However, we did not do this seeing that the tripod was already quite sturdy. Under each leg an adjustable feet was placed to adjust the height of the tripod whenever it is necessary. At last, the tripod was painted in a light brown color to imitate the reference seen in paragraph 4.1.5.

The top part of the camera needed to be taken of fairly easy, because the camera which we borrowed could not be charged through an usb cable. The requirements was kept in mind while designing the camera. The final design was laser cut and assembled. The camera was designed like one of the references in paragraph 4.1.5. the black leather **stair** was recreated with paper and glued on the camera casing. The casing was just like the tripod painted in the same color.

5.1.5 Putting together the chains

The finalized design for the chains was finished and all the little parts had to be printed. As described in an earlier paragraph the vector shapes of the drawing were also cut and would be later put on the chains. In total 119 front plates, 119 back plates and 238 bottom/top plates were cut and needed to be put together. The individual pieces were painted in the same color as the pedestal.. The pieces needed to be left to dry, but afterwards all the pieces were glued together to finally form both chains. Lastly, the pieces of canvases were glued on the chains to form the final result.

5.1.6 Program showing motivational quotes

As discussed in paragraph 4.1.6 the program that shows quotes needs to include a few requirements:

- All elements in the program need to have an option to be adjusted while running the program.
- The background color has to fade from blue to orange and back.
- Each quote has to fade in and fade out.

The program was made in Processing with help of Joris Quist. The code can be found in the appendices. The final result looks as follows:

All requirements for the screen were met. While the program was running it was possible to change the speed of the clouds, the fading of the quotes, the changeover of the background colors and the amount of frames per second. This is possible by using the keys “1/2/3/4/5/6/7/8/9/0” on the keyboard. To make the speed of the clouds even slower the amount of frames per second could be dropped to 1. For the stop motion video this was necessary since every 30 seconds a photo is supposed to be made. More on the making of the stop motion video can be found in Sjoerd Baarslag’s thesis.

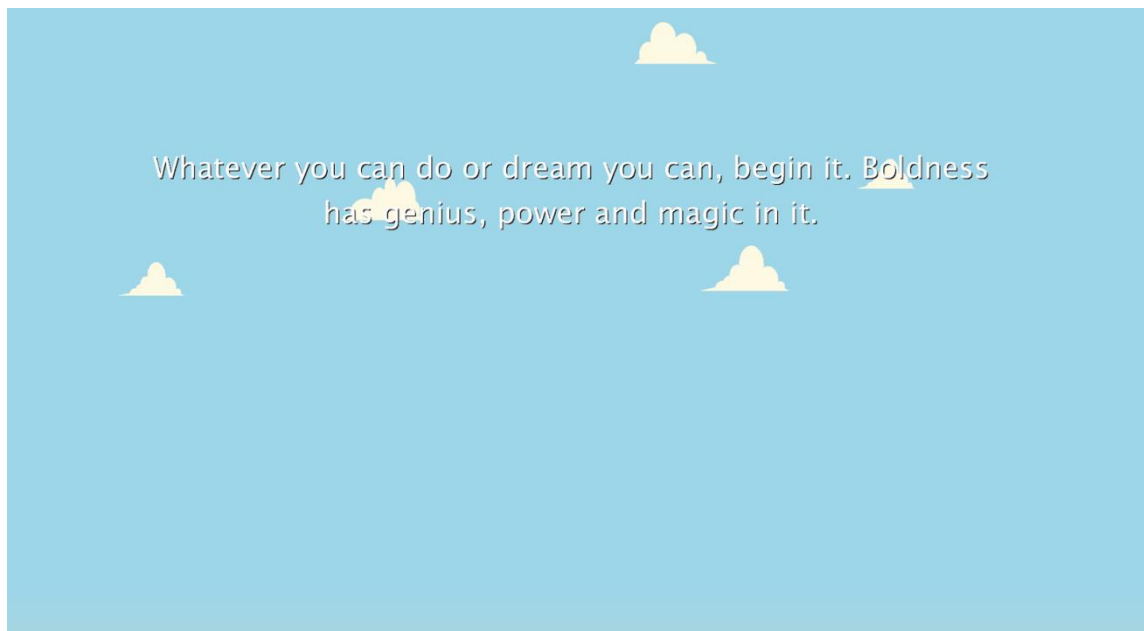


Figure 5.2.6.1- Screen program

The background color changed from blue to orange which represents the coming of the evening. In figure 5.2.6.2 and 5.2.6.3 the stages of the changeover are illustrated. The 300 quotes are written down in a “.txt” file and imported in the processing file. When the quotes need to be changed it can easily be done by changing the file.

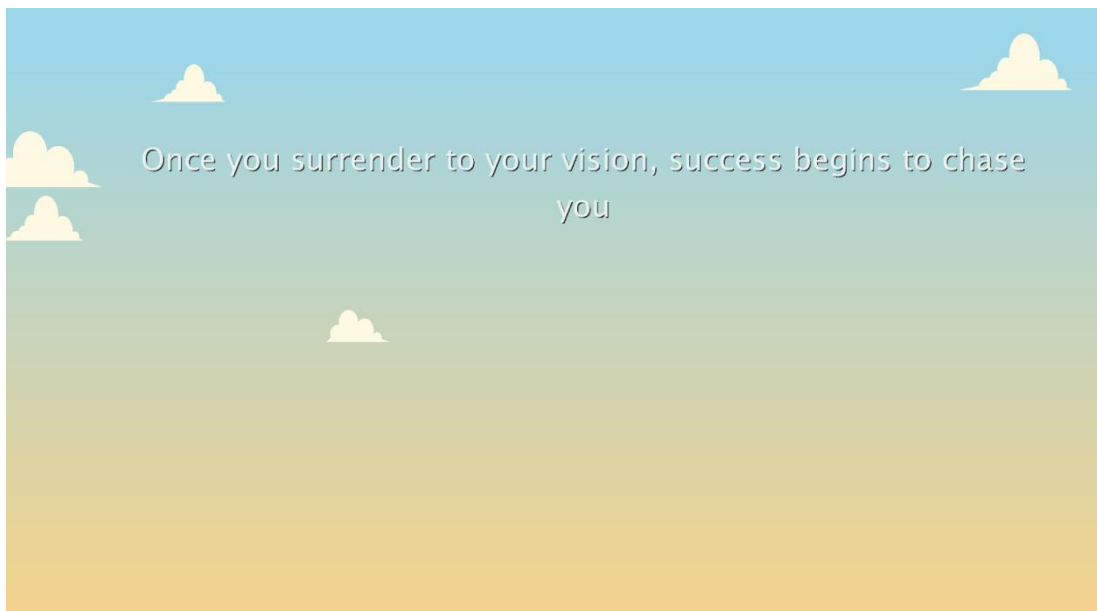


Figure 5.2.6.2- Screen program, blue and orange sky



Figure 5.2.6.3- Screen program, orange sky

6. Evaluation

The last phase of the design process is the Evaluation and discusses a number of aspects. First the research method is clarified and the process of gathering data is explained. The final results of the evaluation are put in graphs. Finally, the major stakeholder is involved and some questions are asked in order to evaluate if their expectations are met. The results will help answering the questions posed in paragraph 1.1.1.

6.1 Research method

In the following paragraphs the research method will be explained and discussed.

6.1.1 Setting up the environment

First, the environment in which the test would be conducted needed to be set up. As discussed in paragraph 3.1 one of the requirements is that the product requires to be placed in a company's reception hall. The closest place that resembles a reception hall would be Hall B in Carré. At first sight this did seem like a reasonable idea, however the installation turned out to be heavier than expected. Thus, the location needed to be changed to a place which is closer to the wood workshop. Together with Han Davina a part of the entrance at the library in the Vrijhof was changed. A black screen was put behind the installation and shelves were put to the sides. A picture of the final setup is shown in figure 6.1.1.1.



Figure 6.1.1.1- Set up

6.1.2 What information is contemplated and how to get it

Two days were pinned out to perform the tests. In paragraph 1.1.1 both sub-questions have been stated and need to be kept in mind while designing the method.

Sjoerd Baarslag's sub-question is:

“Do the passersby understand the meaning and function of the prototype?”

The research he will conduct in order to answer his sub-question will be done through interviews. Whenever someone looks at the installation for a certain amount of time he asks them if they want to answer some of the following questions:

- What do you think the function of the installation is?
- What do you think the story of the installation is?
- What do you think the link between the quotes and the rest of the installation is?

The answers were recorded on paper and later rewritten in a google docs.

The other research was done by me and comes forth from the following sub-questions:

“How well does the realized prototype keep the attention of passersby?”

“Does the realized prototype spark curiosity in passersby while people are still interacting with it?”

In paragraph 2.6.3, it was explained that there are several elements in order to measure the passersby attention. Looking at the descriptions there is no need for interviews or surveys. The research will thus mainly consist of observations and each measurement will be determined as follows:

- Attracting power is determined by the passersby selective attention and will be checked by marking a paper every time a passerby looks at the installation. The score will be kept in sections of five minutes.
- Holding power can be assessed by measuring the amount of time a passerby looks actively at the installation. A stopwatch will be used to evaluate the holding power.
- Average holding time is an average of all the measured times a passerby spends at the installation and will be calculated after the tests.

Figure 6.1.1.1 shows the setup of the installation. The observing was done from a reasonable distance further down the hallway. Both tests were done at the same time. However, when a passerby stands for a certain amount of time looking at the installation, or Sjoerd Baarslag did his interview or I checked the holding power. There was no moment where we did both, for the simple reason that we did not want to interfere with each other's test.

Finally, the curiosity in passersby also need to be measured. This will be done by tallying how many times passersby look at the installation when people are still interacting with it. Also the time is being checked when passersby decide to stand still and look at the interactions done by others. Some general observations have been done as well.

6.2 Results

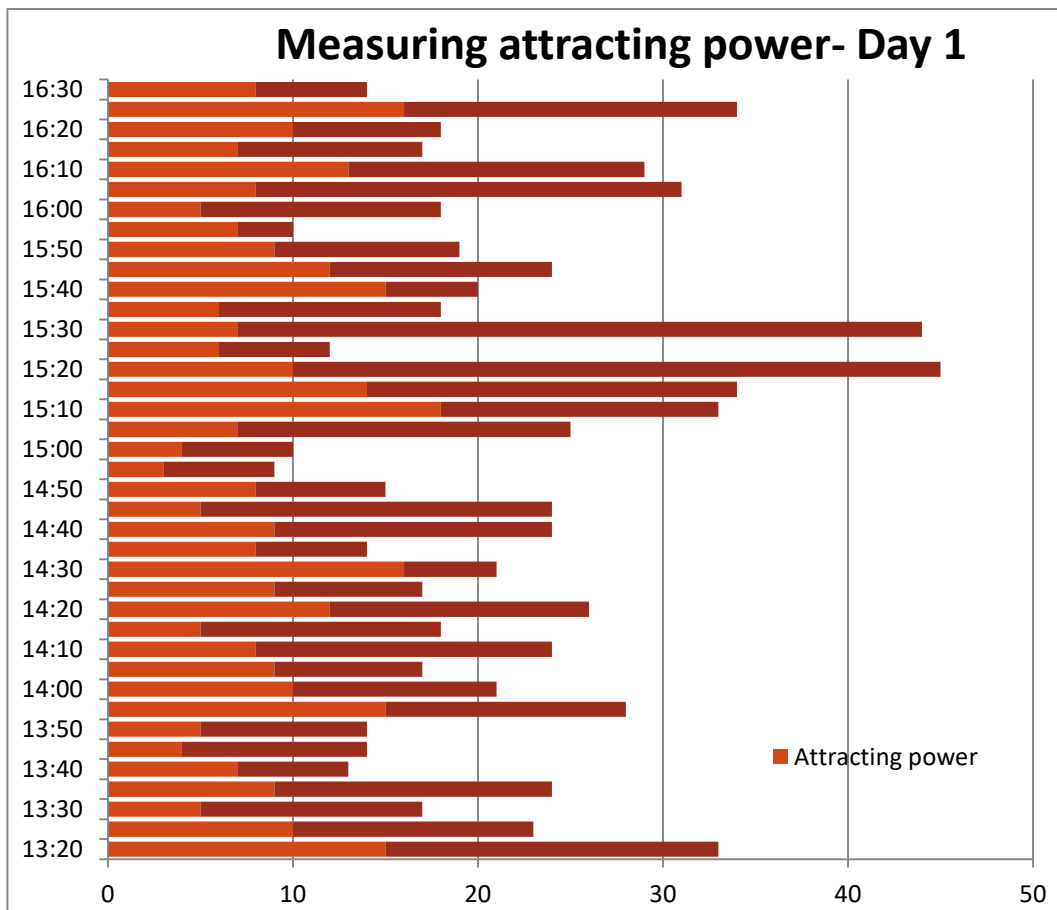
Both researches led to very interesting findings. Sjoerd Baarslag started his research by doing interviews. The results are summarized in the following insights:

- People based the meaning behind the installation solely on the quote which was currently displayed on the television.
- The purpose of the sculpture was also not understood by most of the interviewees. The results were that three out of fifteen participants did not guess the purpose or deeper meaning of the installation. However, five out of fifteen were very close to the purpose.
- The story of the sculpture was also not guessed by most of the interviewees.

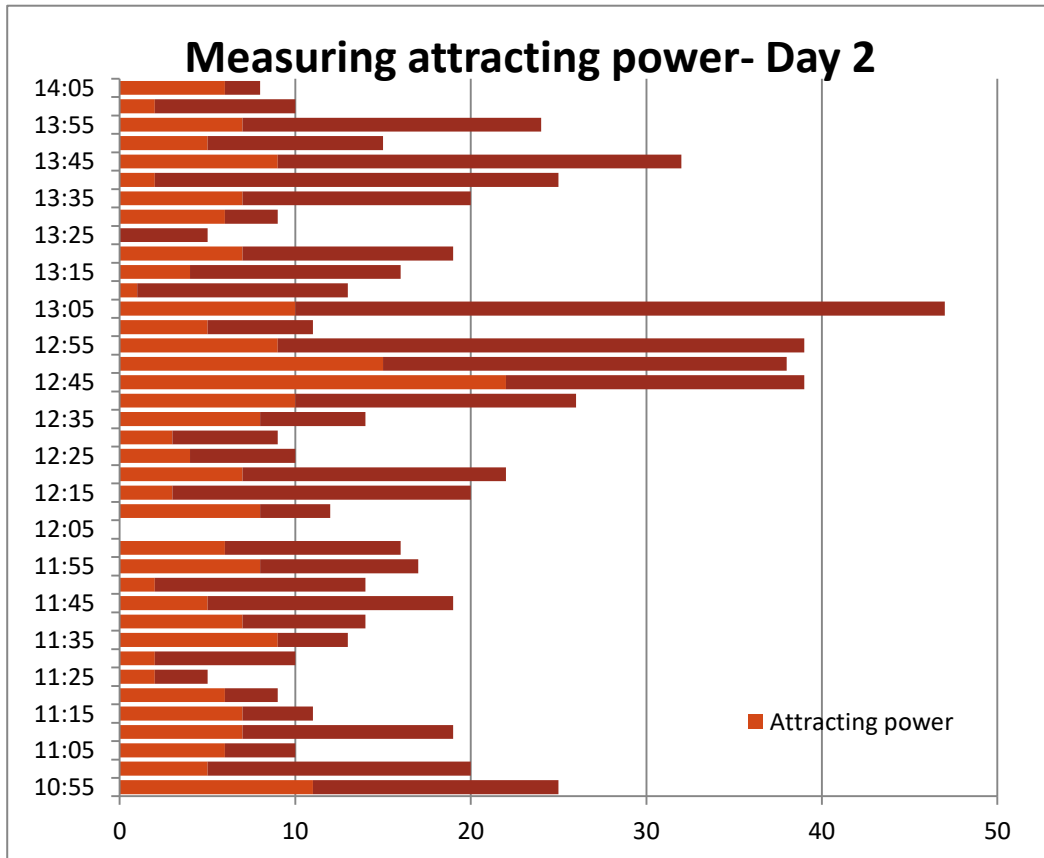
Nevertheless, the installation got a lot of kind words. They complimented the way the slow motion/time-lapse worked and on how big the installation is.

As discussed in paragraph 6.1.2 the attracting power is measured by keeping a score of how many people look at the installation. To get an even better indication of the attracting power the score of people who were walking by the installation without looking, was also kept and compared. The results are put in graphs 6.2.1 and 6.2.2. Unfortunately, the time in which the test was conducted varied for both days. The first day started at 13:20 due to some technicalities and the second at 10:55.

The graph 6.2.1 illustrates the amount of people who have seen the installation. The total amount of people walking past the installation, in a time span of 3 hours and 10 minutes is 851. 354 from the 851 have seen the installation which comes down to 42% on day 1. The second day was done the exact same way. Looking at the graph it is already clear that there were less people walking in the hall of the Vrijhof. Some reasons for this could be that most of the students left the campus to go home for the weekend or they did not need to go to the library to study anymore. Even so, the attracting power can still be assessed. On day 2 the amount of people walking past the installation, in the same time span as day 1 is 685. 243 people looked back to see the installation which is 35%.



Graph 6.2.1- attracting power day 1



Graph 6.2.2- attracting power day 2

Next, the holding power will be assessed by checking the amount of time passersby look actively at the installation by using a stopwatch and will be recorded in seconds. Same time stamps indicate that two people stood at the installation at the same time. It has to be kept in mind that the time stamps are not totally accurate. For example, when the holding power was tallied at 13:28, the mark will be put in the section between 13:25 and 13:30. However, only 13:25 will be pointed out in the tables below. As shown in table 6.2.3, 41 people took the time to stand still next to the installation and looked attentive to the elements in the prototype. The time ranges from 2 seconds to 83 seconds and the average of all the measured times is 18 seconds. The following day only 21 people took the time to look at the installation this is seen in table 6.2.4. This is almost the half of day 1. This time the range only went from 2 seconds to 18 seconds. So the average holding time for day 2 is only 11 seconds. Concluding, the average holding time for both days will have to be calculated by the weighted average, namely:

$$41 \times 18 + 21 \times 11 = 969$$

$$969 / (41 + 21) = 969 / 62 = 15.6290322581 \text{ seconds}$$

The average holding time for day 1 and day 2 is 15.6 seconds.

When	13:25	13:30	13:50	14:10	14:15	14:15	14:20	14:20	14:25
Amount of time	4	7	7	8	83	83	5	5	30
When	14:30	14:35	14:40	14:45	14:50	14:55	15:00	15:00	15:05
Amount of time	30	27	40	6	20	15	5	5	23
When	15:10	15:15	15:20	15:25	15:25	15:30	15:35	15:35	15:35
Amount of time	23	60	9	18	18	3	5	5	5
When	15:40	15:45	15:50	15:50	16:05	16:10	16:10	16:15	16:20
Amount of time	18	4	18	18	15	20	20	4	7
When	16:20	16:25	16:25	16:30	16:30				
Amount of time	20	11	11	2	28				

Table 6.2.3- Holding power day 1

When	11:15	11:15	11:20	11:40	11:50	11:55	12:00	12:30	12:45
Amount of time	16	16	7	7	2	12	10	13	10
When	12:50	12:55	13:00	13:05	13:05	13:10	13:20	13:30	13:40
Amount of time	10	5	8	9	9	12	15	18	7
When	13:45	14:00	14:05						
Amount of time	12	18	10						

Table 6.2.4- Holding power day 2

Unfortunately, the amount of people who were curious about other people interacting with the installation was really low. On the first day only four people were curious enough to stand still and watch other people interact. On the second day this number is halved and comes down to only two people.

General observations during Sjoerd Baarslag's interview have also been made. The way people were acting and their gestures were closely inspected. Some very interesting points came to light which should definitely be looked into. A list of the most intriguing observations have been put in a list and will be discussed further.

- Passersby are not approaching the installation, they only look at it for 1 or 2 seconds.
- When passersby do come closer, they only stare for a few seconds at the camera and walk away.
- Pictures were taken.
- People looked at the installation and did not know that they should also look at the camera.
- Some of the spectators decided to join the interaction, because they knew the person who was first doing the interaction.
- Some people stood still and looked at the installation from a big distance.
- One of the passersby was clapping her hands, because of enthusiasm.
- Most of the passersby had different ideas about the meaning of the installation.

All observations are according to the results in this chapter and Sjoerd Baarslag's results. The observation which stood out most was that passersby were looking at the installation from a big distance. They were interested, but it seemed as if they were too afraid to stand a little bit closer. In order to understand the meaning behind the installation more time has to be spent looking at it. If people are afraid of approaching the installation it will not be possible to convey a motivational and encouraging message. This is a very big flaw and should be solved. In the following paragraph the results will be further discussed and conclusions are going to be made.

6.3 Conclusion

Looking back at the results we can make a few conclusions. After summarizing and briefly explaining Sjoerd Baarslag's results the conclusion of his test will be given. He concludes that the installation can definitely use improvements since 5 out of 18 people understood the function of the installation and only 1 out of 18 guessed the story behind it.

The attracting power on day one is 42% which is about 2 out of 5 who looked back at the installation. This is a lot of people since 851 people walked in the hallway of the Vrijhof that day. Despite the successful first day, the second day was not too bad either. The total amount of people walking through the hallway that day was 685 and 243 of them did look back. This falls down to 35% which is about 1 out of 3 people who got interested and looked at the installation. It can be concluded that the installation has enough attracting power to make people have a second look at its elements. The installation is now a prototype and a lot can be changed to make these ratio's even better.

Not only did the installation catch the sight of passersby, but it also made people stand still for a certain amount of time to observe its various aspects. The first day 41 passersby stood next to the installation. The time ranged from 2 seconds to 83 seconds and the average holding time is 18 seconds. The mentioned holding time is quite good for a prototype which still needs some further improvements. It is however not enough to see all the components of the installation. The animation on the camera already takes more than one minute and should preferably watched entirely. Also, 15,6 seconds will not be enough to make people think about their goals and vision for the future. The average holding time on day 2 is even less, namely only 11 seconds. Nevertheless, the average holding time of both days is 15.6 seconds which is still pretty decent for a prototype with many flaws. A reason for a reasonably low holding power could be that passersby do not feel like there is more to the installation than a pretty display. The only visible moving element would be the camera. This is also where people looked the most at. After watching the animation for a few seconds the interest will be lost and they walk away. A new solution has to be found to make people stand longer at the installation in order to trigger a train of thoughts about the motivational quotes.

Next, the curiosity in passersby was almost not triggered by the installation. On day 1 the installation sparked curiosity in only four people. The time they stood there ranged from 2-3 seconds which is very little. The second day only two people stood still at the installation. Like day 1 they only stood there for 2-3 seconds. This means that people do not feel invited by the installation to stand still. Also, the interaction is not mysterious enough to make spectators questions what it is. One of the requirements is that people should take their time to think about motivation and their vision for the future. In the current state of the prototype this will not be met.

Finally, the general observations were apparent in the test results. Passersby are not approaching the installation as much as we hoped. They only look over their shoulders for 1 or 2 seconds. When passersby do approach the installation they tend to only stop for a few seconds. Some of them did not even know the chains were moving and only looked at the camera and time lapse. The observation which stood out the most was that people did not

want to stand near the installation, because they were very timid. In the next chapter some recommendations will be given for the problems found in this paragraph.

6.4 Client evaluation

After completing the test phase a final client evaluation was done. After testing the installation Menperium visited the Vrijhof in order to inspect and observe the final prototype. A short interview was held in order to finalize the evaluation phase. Some questions were asked about their expectations and if they were met.

Both Clemens Mensink and Fabienne Heijne visited the Vrijhof. The questions which were asked and answered are listed below. It should be noted that the answers are translated from Dutch.

- **What is your first impression of the final product?**

Mensink: “The installation is very big and properly finished. The colors are very vibrant and beautiful. The idea that the installation is running is still sinking in. However, the screen can be a little bit more fancy. Also, the pedestal and everything are very well calculated beforehand.”

Heijne: “I’m very impressed by the visualizations. The installation looks like it is not made by hand, instead it looks like a printed image! The camera was a nice addition and is part of the attractiveness of the installations. I’m proud that the Menperium logo is on the installation”

- **Did the final product meet your expectations after the concept was explained?**

Mensink: “It was not what I expected. The idea was the same, but the final product looks more professional. I am pleasantly surprised.”

Heijne: “I did not expect that a final product would be standing here. I was more thinking about an unfinished prototype.”

- **Is the quality of the final product sufficient?**

Mensink: “The quality is definitely sufficient for students. More than sufficient! If you want to make it commercial than not yet, but for a demo it is fine.”

Heijne: “The quality is certainly above average. The installation is at the second last step of selling it to companies.”

- **Did the installation meet all your requirements? – can you elaborate on this?**

Mensink: “The installation is not interactive. The installation could be more interactive. If the installation would get a title it would be clear what it does. There should be some explanation.”

- **Can you name some good aspects of the final installation?**

Mensink: “Colorful, properly finished, it works. Borrowed and bought materials were used properly.”

Heijne: “The way it works is nice, There also has been found a way to make the chain stand straight. Another nice touch is that you did not use a regular chain, but made it yourselves.”

- **Can you name some aspects of the project that can use some improvement?**

Mensink: “The installation could be a little more dynamic. The television program could also be a little bit more cheerful.”

Heijne: “The final product should be a little bit better if you want to sell it. There should not be more element or else the installation would become too crowded. It would be nice if there was a distinction between day and night. It is better than it needed to be.”

- **Do you think our installation will make people think about their future vision as was listed in your requirements?**

Mensink: “After five minutes it would become more clear what the installation means. The quotes are visible, but they are a second instance. If the installation would have a title it would become more easier to attract people and make them think about the quotes and the meaning behind it.”

Heijne: “On the camera screen the quotes appear every second. It has potential. The requirement is reached. If you see one quote you will keep it in mind and take it home with you.”

The installation received a lot of praise from the client. The display and mechanism were complimented a lot. Kind words were given, however the installation was not seen as finished thus some points of concern were raised and recommendations were given. The feedback will be incorporated in the next chapter.

7. Conclusion & Future recommendations

The last chapter will elaborate further on the sub-questions, research question, results and conclusions from the previous chapters. The questions posed in chapter 1 will be named again and answered. Finally, recommendations for discovered flaws during the realization and evaluation phase will be given and further elaborated.

7.1 Conclusion

The challenge posed in chapter 1 is designing and creating a motivational sculpture. Before tackling this challenge a list of requirements were given and the design of the sculpture needed to meet all of them. Several concepts have been made according to the needs of Menperium. One of them met all requirements as was later further developed. During the Realization phase certain flaws arose which were not noticed in the Specification phase. Lastly, the Evaluation phase did give us more insight in what passersby think of the current setup of the prototype. Looking back at the questions posed in paragraph 1.1.1 it is now possible with the gathered information in previous chapter to answer them.

In order to answer the research question the following sub-questions have to be answered first. As stated in paragraph 1.1.1 the sub-questions have been divided evenly and will be answered chronologically.

- *How do artists incorporate interaction into their installations?*

Looking back at the research of interactive art installations it can be concluded that interactive art installations can be further divided into two new categories: they can be technical and non-technical. “Just like drops in time, nothing” and “The beach” show no use of any kind of sensor or computer. Interaction is established through senses in the body and physical interactivity.

- *How do artists incorporate a story into their art installations?*

Art installations with a deeper meaning do not really have a further distinction. Looking at the examples given, it can maybe be said that the distinction lies in the meaning that can be easily seen or not. The Lure series have a very meaningful backstory, but at first glance it is hard to imagine this story after looking at it for a first time. The story behind “Slight uncertainty” on the other hand can be derived more easily. We see the bitter looking statues literally hanging unto umbrellas. They look downwards as if they want to know how long it take before they fall onto the ground.

- *How do artists create a communication between their art piece and the environment*

This sub-question was researched by Sjoerd Baarslag. According to his related work there can be made five distinctions in which artists include communication in their art work. The first way is to communicate through the rhythm and shape of the environment. One of the example he gives is the Industrial forest designed by Eric Schuldenfrei and Marisa Yiu of ESKYIU studio. The second approach is to reuse materials that appear in the environment which will fuse the installation into the environment. The third way is using colors which are comparable with the colors of its environment. This way the art piece will merge with its surroundings. The fourth way is to make the installation blend in with its environment. He showed some examples of installations were big rabbit and big birds were used as blending element. The last way is to make your art piece reshape the environment.

The final category consisted of art pieces that reshape the environment it is standing in.
- *How do artists embody motivation into their art pieces?*

Sjoerd Baarslag researched how artists embody motivation into their art pieces. He states that there can be made two distinctions. The first distinction is art pieces which address directly to behavioral change. Art pieces which direct to behavioral change present people what the intended goal is. For example one of the installation shown in his research is a trash bin which encourages people to use their cigarette buds to vote, instead of throwing them on the street. The second way is to indirectly change the behavior of people. The goal is thus not clear. Sjoerd Baarslag suggest that this often lays around topics such as climate changes, political issues, and societal issues.
- *How does one make an engaging interactive art installation?*

One of the researches done by me is a literature review on how to make an art installation interactive and which components should be considered while designing an interactive art installation. There are several strategies mentioned in the literature which are very handy and need to be kept in mind while designing such an installation. In our own installation we did use some strategies in order to change the spectator experience and the user experience. It should be noted that each art installation is different and respective strategies have to be picked out and applied. Nevertheless, importance should be given to capturing the attention of passersby, trying to hold it as long as possible and provoke participation as well as spark the curiosity in spectators.

- *What is the best way to implement non-human encouragement?*

Sjoerd researched the best way to implement non-human encouragement. He found out that non-human encouragement has one big advantage over human encouragement which is the amount of encouragement that can be delivered. However, a conclusion cannot be given. It needs to be clarified that little research has been done which focuses on the most effective way to encourage and implement non-human encouragement. Also, there has been little to no research done that compares non-human encouragement with human encouragement.
- *Do the passersby understand the meaning and function of the prototype?*

During the test a lot of positive feedback was given, but it should be mentioned that these kinds of words were given by people who took the time to look at the installation. Sjoerd's conclusion comes down to the fact that there has to be made some modifications in order for everyone to understand what is going on with the installation. Five of the eighteen participants did get the function which is motivating people, of the installation. Only one of the eighteen did guess the story behind the installation. Solutions have to be found in order to get more people to understand the meaning and function of the prototype.
- *How well does the realized prototype keep the attention of passersby?*

According to my results in paragraph 6.2 the respective sub-questions can be answered. In order to measure the attention of passersby towards an installation the attracting power, holding power and average holding time need to be assessed first. The attracting power on day 1 and day 2 were 42% and 35% respectively which is very high for a prototype. The holding power and average holding time come down to 18 seconds for day 1 and 11 seconds for day 2. This is too little for an installation which needs to make people rethink their future visions. It can thus be concluded that the realized prototype is not fully able to keep the attention of passersby. The installation is very impressive, but passersby do not feel the need to understand the installation better which is the opposite of what we envisioned. The installation needs to be more inviting, because it looked as if they were afraid of standing longer at the installation and looking longer at the various elements.
- *Does the realized prototype spark curiosity in passersby while people are still interacting with it?*

The curiosity in spectators was also not triggered. As stated in the previous chapter only 6 spectators took the time to look at what other people were interacting with. This is far from what we imagined and needs to be corrected. The interaction with the installation was supposed to be expressive, but it was still not inviting enough

for spectators to stand still, look at the interaction and finally interact with the installation themselves. In order to find a solution for this problem, the literature about spectator experience needs to be reread and evaluated again.

After answering all the sub-questions the research question can finally be answered.

“How can an art installation showing quotes, placed in the hallway of a company, bring out employees’ intrinsic motivation in order to reach personal goals.”

Unfortunately, there is not enough information to answer the research question due to time limitations. More tests have to be conducted in order to test if passersby really get motivated to reach personal goals. The tests which have been done in this report solely focuses on two things, namely: attraction of attention and if people understood the meaning behind the installation. For further research more literature has to be found which explains different ways on how to assess motivation or non-human encouragement. Nevertheless, both tests gave us valuable insights in the final prototype. It could be concluded that the prototype has a lot of potential if small changes are applied. Our client is very pleased with the end results and the prototype exceeded their expectations. These small changes are further elaborated in the last paragraph of this chapter.

7.2 Future recommendations

All sub-questions and final research question have been answered and various new insights came to light. The gathered insights were not all positive. Flaws came to light and solutions needed to be made in order to get the desired results. This section will go deeper into these flaws and solutions so a strong basis will be made for future works.

The installation does not have the envisioned effect on passersby which is a big flaw that needs to be corrected with simple and good solutions. As stated in the answers in the previous section, passersby do not or barely understand the meaning and function of the prototype. This is a big problem since those are key components in the installation and also requirements given by Menperium. Nonetheless, most of the interviewees were close to guessing the meaning and function behind the prototype. It seemed as if most of the passersby missed a crucial piece of information in order to fully comprehend the installation. So one recommendation for future work could be to come up with a significant title. This title could help the passersby in making them think in the right direction. It looks like a subtle addition, but this could change the results positively and

bring the numbers up to a reasonable and satisfactory amount. This is just a speculation and could still not be enough for passersby to understand the installation. So, another recommendation is adding a sign-board with some explanation. Sign-boards are also used in museums and art expositions. The result is that people get to think in the right direction.

Another problem arose from the answered sub-question. The holding power of the installation was strong enough for a prototype, but if we want to sell the prototype the holding power has to be longer than 15.6 seconds. As discussed, the passersby could feel like there is nothing more to the installation than a pretty display. The installation has many elements which need to be observed carefully, if this is not done the meaning of the installation will be harder to guess. That is why the holding power needs to be brought up. One recommendation for future work and research would be to speed up the rotating chains. Right now the chains would go so slow that it is barely visible that it is moving. If the chain would move a little bit faster the link between the “faster” stop motion video and the slow rotating chain would be more clear. After getting the link the installation would be more understandable and all the other elements would make more sense, thus making the holding power of the installation stronger.

The final major problem found after looking through the answers of the sub-questions would be that spectators are scared of joining others who are interacting with the installation. The few who dared to stand next to the people who were interacting, were still very hesitant of joining. After some second of thought they eventually did. There were also cases where it looked like spectators wanted to join in, but in the end they did not. The problem that causes this is the fact that the installation is not inviting enough. A few recommendations would be to add more elements which make the installation more inviting. For example, a sign could be placed at the camera with a text that says: “Look through me”. This way people will not be afraid of looking at the installation and stopping to get a closer look at everything. As a result, the number of spectators joining the others will be higher. The interaction with the installation could be made more obvious, or the opposite by making it secretive. It was already mentioned in paragraph 4.1.5, the idea of putting a cloth around the camera was disapproved by Menperium. It was never tested if this secretive interaction would make more people curious about the installation. In the future there should be made a test with this cloth around the camera. It could be a solution for the mentioned problem.

To finalize this chapter, a list of tiny flaws encountered during the design process will be given below.

- **Give chain “feet” that make it slide better over the painted surface.**
During the realization phase it was already clear that the chain would not ride smoothly on the pedestal. A quick solution needed to be come up with, therefore

duct tape was put under every piece of the chain. To our surprise, it did make the whole chain turn smoother on the surface of the pedestal.

- **Solve lighting issue.**

During the test phase we came to the realization that the hallway in the Vrijhof was too dark for the camera. That is why at the last minute we had to find a big source of light. Luckily, Han Davina had a spare theater lamp that he could lend to us. For future adjustments, a bright spot should be chosen or else a light source that does not heat up too fast.

- **Give top paint layer a protective surface.**

After carrying the installation into the hallway the paint was damaged at certain parts. A layer of protective paint should easily resolve this problem.

- **Find a cheaper camera that can fulfill the same roll.**

The camera used for this project was borrowed from one of our classmates. So using the camera could only be done at certain days. This made the whole design process more difficult.

- **Replace the laptops by smaller and cheaper computers, such as raspberry pi.**

During the test both Sjoerd's laptops were used to run the elements in the installation. Buying two laptops for something which can be easily done on one raspberry pi would not be logical.

- **Test durability chain.**

The chain came loose at one point, because it was going so slow that it was not visible on the front and on the stop motion video. Testing the chain on other technicalities would be a good step in the right direction.

- **Add wheels to the pedestal.**

During the relocation of the installation we encountered that it was not as portable as hoped. Some wheels should be attached under the pedestal to make relocating easier.

- **Replace stepper motors.**

The stepper motors in the installation were all borrowed from the Smart xp. New ones should be bought and installed.

- **Replace servo of automata.**

The same applies for the servo motor in the automata. A new one should be bought and installed.

- **Test durability of automata.**

To make sure the automata will run smoothly without supervision. The automata has to be tested for its durability. This will help the maintenance for the future.

References

1. Introduction

Taylor, J., & Westover, J. (2011, 01). Job satisfaction in the public service. the effects of public service motivation, work-place attributes and work relations. ,13, 731–751.

Tate. (n.d) Installation art [Article]. Retrieved from <http://www.tate.org.uk/art/art-terms/i/installation-art>

Problem statement

Mensink, C. (n.d) Why do we do what we do [Blog post]. Retrieved from <http://www.menperium.com/>

2. Related work

Interactive art installations

Interactive art. (2018, April 20) Retrieved from https://en.wikipedia.org/wiki/Interactive_art

The beach. (2018, April 20) Retrieved from <http://www.snarkitecture.com/the-beach/>

Trpak, M. (n.d) Slight uncertainty [Article]. Retrieved from <http://www.michaltrpak.com/en/stranka/sochy/slight-uncertainty/1561/>

Beili, L. (n.d) Lure series [Article]. Retrieved from <http://www.beililiu.com/Lure>

Teamlab. (n.d) Flowers and people- dark [Article]. Retrieved from <https://www.teamlab.art/w/flowerandpeople-dark>

Art Gallery of New South Wales. (n.d) Just like drops in time, nothing [Article]. Retrieved from <https://www.artgallery.nsw.gov.au/collection/works/276.2002/>

Communicating with the shape and rhythm of the surroundings.

de Kwant. H. (2013). Le Désir et la Menace: Beautiful Art Installation of Wired Birds [Article]. Retrieved from <https://www.theearthhunters.com/le-desir-et-la-menace-beautiful-art-installation-of-wired-birds/>

Etherington R. (2012, March 20). Laputa by Outofstock [Article]. Retrieved from <https://www.dezeen.com/2012/03/20/laputa-by-outofstock/>
Electric

Art installations and motivation

Unknown. (2016, Juni 9). Trash Talk Campaign to Clean Up Litter in Central Manchester, UK [Article]. Retrieved from <https://waste-management-world.com/a/trash-talk-campaign-to-clean-up-litter-in-central-manchester-uk>

Zarin. C. (2015). The Artist Who Is Bringing Icebergs to Paris [Article]. Retrieved from <https://www.newyorker.com/culture/culture-desk/the-artist-who-is-bringing-icebergs-to-paris>

Addressing the components of an interactive art installation

Battarbee, K., & Koskinen, I. (2005, 03). Co-experience: User experience as interaction. *CoDesign*, 1 , 5-18. doi: 10.1080/15710880412331289917

Forlizzi, J., & Battarbee, K. (2004). Understanding experience in interactive systems. In *Proceedings of the 5th conference on designing interactive systems: Processes, practices, methods, and techniques* (pp. 261{268). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/1013115.1013152> doi: 10.1145/1013115.1013152

Forlizzi, J., & Ford, S. (2000). The building blocks of experience: An early framework for interaction designers. In *Proceedings of the 3rd conference on designing interactive systems: Processes, practices, methods, and techniques* (pp. 419{423). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/347642.347800> doi: 10.1145/347642.347800

Gajendar, U. (2003, 01). Attention, attraction, and the aesthetic value: Understanding beauty as a problem of user experience. Retrieved from <https://www.researchgate.net/publication/242103090> Attention Attraction and the Aesthetic Value Understanding Beauty as a Problem of User Experience

Hekkert, P. (2006, 06). Design aesthetics: Principles of pleasure in design. *Psychology Science*, 48 , 157-172.

Hermanson, K., & Csikszentmihalyi, M. (1995). Intrinsic motivation in museums: Why does one want to learn? In *Public institutions for personal learning: establishing a research agenda* (p. 67-78). Washington: American Association of Museums.

Howard, C. J., & Holcombe, A. O. (2010, Nov 01). Unexpected changes in direction of motion attract attention. *Attention, Perception, & Psychophysics*, 72 (8), 2087{2095. Retrieved from <https://doi.org/10.3758/BF03196685> doi: 10.3758/BF03196685

- Jacucci, G., Wagner, M., Wagner, I., Giaccardi, E., Annunziato, M., Breyer, N., . . . others (2010). Participart: exploring participation in interactive art installations. In *Mixed and augmented reality-arts, media, and humanities (ismar-amh)*, 2010 ieee international symposium on (p. 3-10).
- Jensen, K. A. (2006). Effects of the artistic design of interpretive signage on attracting power, holding time and memory recall (Unpublished doctoral dissertation). Humboldt State University.
- Kaye, J. J. (2007). Evaluating experience-focused hci. In *Chi '07 extended abstracts on human factors in computing systems* (pp. 1661{1664). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/1240866.1240877> doi: 10.1145/1240866.1240877
- Morrison, A. J., Mitchell, P., & Brereton, M. (2007). The lens of ludic engagement: Evaluating participation in interactive art installations. In *Proceedings of the 15th acm international conference on multimedia* (pp. 509{512). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/1291233.1291358> doi: 10.1145/1291233.1291358
- Patterson, D., & Bitgood, S. (1988). Some evolving principles of visitor behavior. *Visitor studies 1988: Theory, research and practice*, 40-50.
- Reeves, S., Benford, S., O'Malley, C., & Fraser, M. (2005). Designing the spectator experience. In *Proceedings of the sigchi conference on human factors in computing systems* (pp. 741{750). New York, NY, USA: ACM. Retrieved from <http://doi.acm.org/10.1145/1054972.1055074> doi: 10.1145/1054972.1055074
- Sandifer, C. (2003). Technological novelty and open-endedness: Two characteristics of interactive exhibits that contribute to the holding of visitor attention in a science museum. *Journal of research in science teaching*, 40 (2), 121-137.
- Tate. (n.d.). Art installation. Retrieved from <http://www.tate.org.uk/art/art-terms/i/installation-art>
- Torta, E., van Heumen, J., Cuijpers, R. H., & Juola, J. F. (2012). How can a robot attract the attention of its human partner? a comparative study over different modalities for attracting attention. In S. S. Ge, O. Khatib, J.-J. Cabibihan, R. Simmons, & M.-A. Williams (Eds.), *Social robotics* (pp. 288-297). Berlin, Heidelberg: Springer Berlin Heidelberg.

3. Ideation

Art style

Heyshop (Unknown). Winter. Retrieved from <https://heyshop.es/products/winter>

Heyshop (Unknown). January. Retrieved from <https://heyshop.es/products/winter>

Anderson Design Group (2013). Mount Rainier National Park. Retrieved from <https://www.andersondesigngroupstore.com/a/collections/shop-by-product/8092125511/american-national-parks/mount-rainier-national-park>

Celine Calmettes Créations (2016). Petit théâtre d'ombres. Retrieved from <https://www.joliplace.com/les-lampes-de-celine-calmettes/>

Heather Colbert (2018). (still from) Dolly Said No To Elvis. Retrieved from <https://directorsnotes.com/2018/02/21/heather-colbert-dolly-said-no-to-elvis/>

Camera

Amazon (Unknown). Old time Retro look camera replica home decorative gift brown tripod. Retrieved from <https://www.amazon.com/Retro-Camera-Replica-Decorative-Tripod/dp/B00W5IUXXY>

Sydney Prop Specialists (Unknown). Camera, old world, box on tripod style. Retrieved from <http://www.sydneyprops.com.au/event-theme-hire/top-themes/hollywood-theme/cameraan>

4. Specification

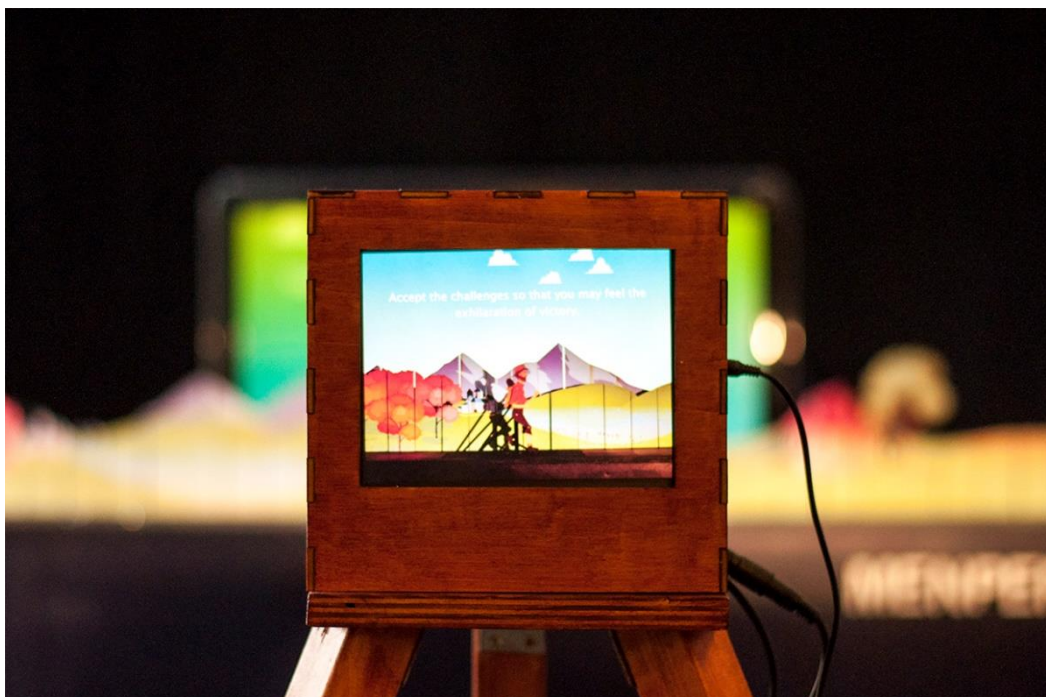
Automata

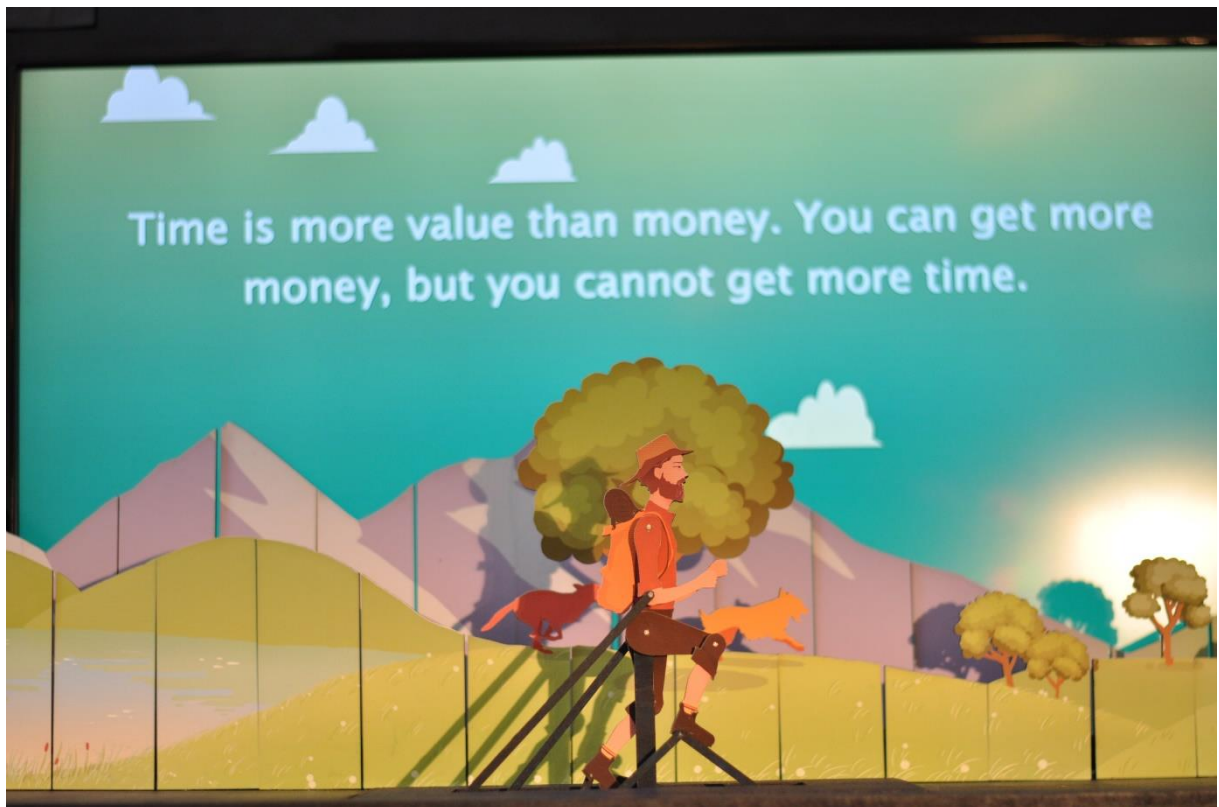
Cecilia Schiller (2018). Team work. Retrieved from <https://ceciliaschiller.com/team-work-2/>

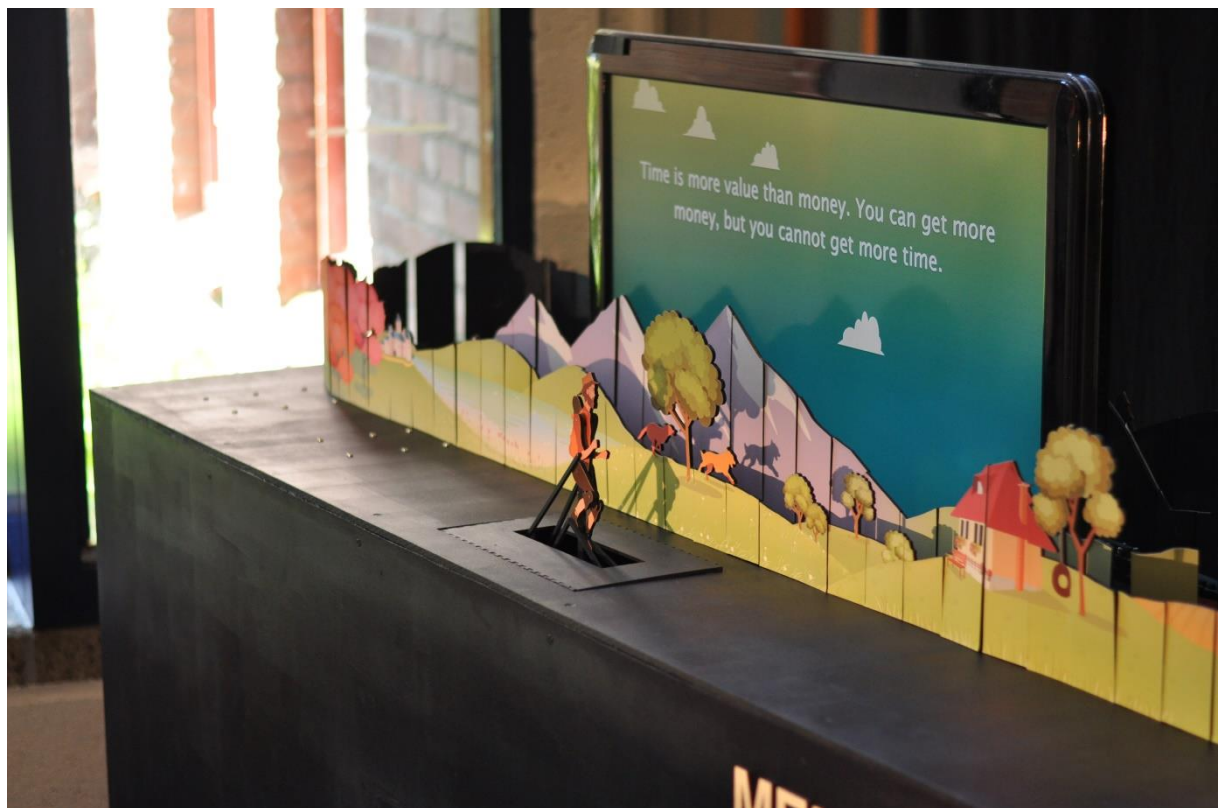
Appendix

Photos of installation

This appendix contains several photos of the installation made right after the testing phase. The full time lapse video can be found on the following link: https://youtu.be/Kc4SIT8QG_E.







Processing screen code

```
import java.io.*
BackgroundManager backgroundManager;
CloudManager cloudManager;

QuoteManager quoteManager;

ManagerManager managerManager;

boolean paused = false;

void setup() {
  //fullScreen(3);
  size(1920,1080);
  background(0);

  CloudFactory cloudFactory = new CloudFactory(3, 0, 540, 0.1, 0.5);
  cloudManager = new CloudManager(5, cloudFactory);

  color[] backgroundColors = {color(157, 214, 232), color(255, 210, 128)};
  backgroundManager = new BackgroundManager(backgroundColors, 1000);

  quoteManager = new QuoteManager("quotes.txt", 200, 100, 1920 - 2 * 200, 350);

  managerManager = new ManagerManager(backgroundManager, cloudFactory, quoteManager);
}

void draw() {

  frameRate(managerManager.getFPS());

  if (!paused) {
    backgroundManager.update();
    cloudManager.update();
    quoteManager.update();
  }

  backgroundManager.draw();
  cloudManager.draw();
  quoteManager.draw();
  managerManager.draw();
}

void keyPressed() {

  if (key == ' ') {
    paused = !paused;
  }
  managerManager.keyPressed(key);
}
```

```
}
```

Background manager

```
public class BackgroundManager implements Serializable {

    private color[] colors;

    private transient PImage backgroundImage;

    private int index;

    private int transitionPosition;
    private float transitionWidth;

    private float transitionSpeed;

    public BackgroundManager(color[] colors, int transitionWidth) {
        this.colors = colors;
        this.index = 0;
        this.transitionWidth = transitionWidth;
        this.transitionSpeed = 1;

        this.backgroundImage = createImage(width, height, RGB);
        this.transitionPosition = width;
    }

    public void update() {
        transitionPosition -= transitionSpeed;

        if (transitionPosition < -transitionWidth) {
            updateIndex();
            transitionPosition = width;
        }
    }

    public void draw() {
        backgroundImage.loadPixels();
        for (int i = 0; i < backgroundImage.height; i++) {
            float stage = (float) (i - transitionPosition) / transitionWidth;
            color columnColor = getMixedColors(stage);
            for (int j = 0; j < backgroundImage.width; j++) {
                backgroundImage.pixels[i*backgroundImage.width+j] = columnColor;
            }
        }
        backgroundImage.updatePixels();
        background(backgroundImage);
        //background(getMixedColors(1 - (float) transitionPosition/1920));
    }

    private void updateIndex() {
        this.index = nextIndex();
    }
}
```

```

}

private int nextIndex() {
    return (index + 1) % (colors.length);
}

private color getMixedColors(float stage) {
    return lerpColor(getCurrentColor(), getNextColor(), stage);
}

private color getCurrentColor() {
    return this.colors[index];
}

private color getNextColor() {
    return this.colors[nextIndex()];
}

private void setTransitionWidth(float transitionWidth) {
    this.transitionWidth = transitionWidth;
}

private void setTransitionSpeed(float transitionSpeed) {
    this.transitionSpeed = transitionSpeed;
}

private float getTransitionWidth() {
    return this.transitionWidth;
}

private float getTransitionSpeed() {
    return this.transitionSpeed;
}
}

```

Cloud

```

public class Cloud {

    private float x, y;
    private int cloudHeight, cloudWidth;
    private float velocity;

    private transient PImage image;

    public Cloud(float x, float y, int cloudHeight, int cloudWidth, float velocity, PImage image) {
        this.x = x;
        this.y = y;
        this.cloudHeight = cloudHeight;
        this.cloudWidth = cloudWidth;
        this.velocity = velocity;
    }
}

```

```

    this.image = image;
}

public void update() {
    this.x -= velocity;
}

public void draw() {
    noTint();
    image(image, x, y, cloudWidth, cloudHeight);
}

public boolean isVisible() {
    return (x + cloudWidth > 0);
}
}

```

Cloudfactory

```

public class CloudFactory {

    private int amountOfImages;
    private transient PImage images[];

    private int minHeight, maxHeight;
    private float minVelocity, maxVelocity;

    public CloudFactory(int amountOfImages, int minHeight, int maxHeight, float minVelocity, float
maxVelocity) {

        this.amountOfImages = amountOfImages;

        this.minHeight = minHeight;
        this.maxHeight = maxHeight;
        this.minVelocity = minVelocity;
        this.maxVelocity = maxVelocity;
    }

    public Cloud getCloud() {

        int cloudX = int(random(minHeight, maxHeight));
        float cloudVelocity = random(minVelocity, maxVelocity);
        int cloudHeight = int(random(50, 100));
        int cloudWidth = cloudHeight * 2;

        return new Cloud(1920, cloudX, cloudHeight, cloudWidth, cloudVelocity, getImage());
    }

    public PImage getImage() {
        if (images == null) {

```



```

        images = new PImage[amountOfImages];

        for (int i = 0; i < images.length; i++) {
            images[i] = loadImage("Cloud_" + i + ".png");
        }
    }

    return images[int(random(images.length))];
}

public void setMinimumCloudSpeed(float minVelocity) {
    this.minVelocity = minVelocity;
}

public void setMaximumCloudSpeed(float maxVelocity) {
    this.maxVelocity = maxVelocity;
}

public float getMinimumCloudSpeed() {
    return this.minVelocity;
}

public float getMaximumCloudSpeed() {
    return this.maxVelocity;
}
}

```

Cloudmanager

```

import java.util.*;

public class CloudManager implements Serializable {

    private int amountOfClouds;
    private CloudFactory cloudFactory;

    private ArrayList<Cloud> clouds;

    public CloudManager(int amountOfClouds, CloudFactory cloudFactory) {
        this.amountOfClouds = amountOfClouds;
        this.cloudFactory = cloudFactory;
        this.clouds = new ArrayList<Cloud>(amountOfClouds);

        createNewClouds();
    }

    public void createNewClouds() {
        while (clouds.size() < amountOfClouds) {
            clouds.add(cloudFactory.getCloud());
        }
    }
}

```

```

public void update() {
    Iterator<Cloud> iterator = clouds.iterator();
    while(iterator.hasNext()) {
        Cloud cloud = iterator.next();
        cloud.update();
        if (!cloud.isVisible()) {
            iterator.remove();
        }
    }
    createNewClouds();
}

```

```

public void draw() {
    for (Cloud cloud : clouds) {
        cloud.draw();
    }
}

```

```

}

```

ManagerManger

```

public class ManagerManager {

```

```

    long lastUpdated = System.currentTimeMillis();

```

```

    float updateSpeed = 59.6f;

```

```

    BackgroundManager backgroundManager;

```

```

    CloudFactory cloudFactory;

```

```

    QuoteManager quoteManager;

```

```

    float fps = 60;

```

```

    public ManagerManager (BackgroundManager backgroundManager, CloudFactory cloudFactory,
    QuoteManager quoteManager) {

```

```

        this.backgroundManager = backgroundManager;

```

```

        this.cloudFactory = cloudFactory;

```

```

        this.quoteManager = quoteManager;

```

```

    }

```

```

    public void draw() {

```

```

        if (System.currentTimeMillis() - lastUpdated < 5000) {

```

```

            String info =

```

```

                "update speed (q/w):    " + updateSpeed + "\n" +

```

```

                "transition speed (1/2):  " + backgroundManager.getTransitionSpeed() + "\n" +

```

```

                "transition width (3/4):  " + backgroundManager.getTransitionWidth() + "\n" +

```

```

                "minimum cloud speed (5/6): " + cloudFactory.getMinimumCloudSpeed() + "\n" +

```

```

                "maximum cloud speed (7/8): " + cloudFactory.getMaximumCloudSpeed() + "\n" +

```

```

                "fade speed (9/0):      " + quoteManager.getFadeSpeed() + "\n" +

```

```

"max fade (-/=):      " + quoteManager.getMaxFade() + "\n" +
"fps ([/]):          " + fps + "/" + frameRate;

    text(info, 10, 20);
}
}

public float add(float a, float b) {
    return constrain(round(100 * (a + b)) / 100f, 0, 1000);
}

public float getFPS() {
    return this.fps;
}

public void keyPressed(char c) {

    lastUpdated = System.currentTimeMillis();

    switch(c) {
        case 'q':
            updateSpeed = add(updateSpeed, -0.1);
            break;
        case 'w':
            updateSpeed = add(updateSpeed, 0.1);
            break;
        case 'a':
            updateSpeed = add(updateSpeed, -0.01);
            break;
        case 's':
            updateSpeed = add(updateSpeed, 0.01);
            break;
        case '1':
            backgroundManager.setTransitionSpeed(add(backgroundManager.getTransitionSpeed(), -
updateSpeed));
            break;
        case '2':
            backgroundManager.setTransitionSpeed(add(backgroundManager.getTransitionSpeed(),
updateSpeed));
            break;
        case '3':
            backgroundManager.setTransitionWidth(add(backgroundManager.getTransitionWidth(), -
updateSpeed));
            break;
        case '4':
            backgroundManager.setTransitionWidth(add(backgroundManager.getTransitionWidth(),
updateSpeed));
            break;
        case '5':
            cloudFactory.setMinimumCloudSpeed(add(cloudFactory.getMinimumCloudSpeed(), -
updateSpeed));
            break;
    }
}

```

```

        case '6':
            cloudFactory.setMinimumCloudSpeed(add(cloudFactory.getMinimumCloudSpeed(),
updateSpeed));
            break;
        case '7':
            cloudFactory.setMaximumCloudSpeed(add(cloudFactory.getMaximumCloudSpeed(), -
updateSpeed));
            break;
        case '8':
            cloudFactory.setMaximumCloudSpeed(add(cloudFactory.getMaximumCloudSpeed(),
updateSpeed));
            break;
        case '9':
            quoteManager.setFadeSpeed(add(quoteManager.getFadeSpeed(), -updateSpeed));
            break;
        case '0':
            quoteManager.setFadeSpeed(add(quoteManager.getFadeSpeed(), updateSpeed));
            break;
        case '-':
            quoteManager.setMaxFade(add(quoteManager.getMaxFade(), -updateSpeed));
            break;
        case '=':
            quoteManager.setMaxFade(add(quoteManager.getMaxFade(), updateSpeed));
            break;
        case '[':
            fps = add(fps, -updateSpeed);
            if (fps <= 0) fps = 0.1;
            break;
        case ']':
            fps = add(fps, updateSpeed);
            break;
    }
}
}

```

QuoteManager

```

public class QuoteManager implements Serializable {

    private int x, y, textWidth, textHeight;

    private String[] quotes;
    private int index;

    private boolean fadeIn;
    private float fade;
    private float fadeSpeed;
    private float maxFade;

    private PGraphics textImage;

    public QuoteManager(String filename, int x, int y, int textWidth, int textHeight) {

```

```

this.quotes = loadStrings(filename);
this.textImage = createGraphics(1500, 400);
this.index = 0;

this.fade = 0;
this.fadeSpeed = 2;
this.maxFade = 500;

this.x = x;
this.y = y;
this.textWidth = textWidth;
this.textHeight = textHeight;
}

public void update() {

    updateFade();

    if (!fadeIn && fade < 0) {
        updateImage();
        fadeIn = true;
    }

    if (fadeIn && fade > maxFade) {
        fadeIn = false;
    }

}

public void draw() {

    tint(255, fade);
    image(textImage, 200, 100);
}

private void updateFade() {
    fade += fadeIn ? fadeSpeed : -fadeSpeed;
}

private void updateImage() {
    updateIndex();
    textImage.beginDraw();
    textImage.background(-1, 0);
    textImage.textSize(50);
    textImage.textAlign(CENTER, CENTER);
    textImage.fill(0);
    //for(int x = -2; x < 3; x++){
    //    textImage.text(getCurrentQuote(), x, 0, textImage.width, textImage.height);
    //    textImage.text(getCurrentQuote(), 0, x, textImage.width, textImage.height);
    //}
    textImage.text(getCurrentQuote(), 2, 2, textImage.width, textImage.height);
    //textImage.textSize(80);

```

```

        //textImage.text(getCurrentQuote(), 0, 0, textImage.width, textImage.height);
        textImage.tint(100);
        textImage.fill(255);
        textImage.textSize(50);
        textImage.text(getCurrentQuote(), 0, 0, textImage.width, textImage.height);
        textImage.endDraw();
    }

    private void updateIndex() {
        this.index = nextIndex();
    }

    private int nextIndex() {
        return (index + 1) % (quotes.length);
    }

    private String getCurrentQuote() {
        return this.quotes[index];
    }

    public float getFadeSpeed() {
        return this.fadeSpeed;
    }

    public float getMaxFade() {
        return this.maxFade;
    }

    public void setFadeSpeed(float fadeSpeed) {
        this.fadeSpeed = fadeSpeed;
    }

    public void setMaxFade(float maxFade) {
        this.maxFade = maxFade;
    }
}

```

