Eye can’t see art

Presenting a toolkit for visually impaired and sighted museum visitors to explore 2D art together.

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Presenting a toolkit for visually impaired and sighted museum visitors to explore 2D art together.
All pictures were made by the author, unless specified otherwise.
For this thesis, the Web Content Accessibility Guidelines (WCAG) have been taken into account, to make it accessible to visually impaired people. The PDF provides a large text format and is high in contrast for people with low vision, and offers an alternative or extra explanation for elements such as tables and graphs. The document is also constructed in such a way that audio description is possible for the blind audience.
1. EERSTE IMPRESSIE

1. Ik zie een ...
   (schilderij, foto, tekening, prent).

2. Het kunstwerk is:
   - Liggend georiënteerd
   - Staand georiënteerd
   - Anders

3. In het kunstwerk zie ik ...
   (Beschrijf in één zin wat er letterlijk in het kunstwerk te zien is. Blijf bij feiten.)

4. Het kunstwerk is:
   - Figuratief (ik zie herkenbare figuren)
   - Abstract (ik zie onherkenbare vormen)

5. Is het kunstwerk contrastrijk? Ja/Nee

6. Twee duidelijk aanwezige kleuren zijn ...

   Sprekt het kunstwerk jullie aan?
   - Nee. Begin opnieuw bij een ander kunstwerk.
Executive Summary

All museum visitors should be able to go to any museum they like and observe the artworks they prefer. For visually impaired people this is often not the case, even though museums have a social responsibility to make their collections accessible for everyone. Especially since the United Nations agreed on the rights of persons with disabilities to live independently and participate fully in all aspects of life (2006). The process of creating a more inclusive cultural sector is well underway with successful initiatives. However, when it comes to people with a visual impairment many museums are not or not easily accessible to everyone (yet). Often people with a visual impairment are excluded from truly experiencing the world of visual arts.

In my thesis I explored opportunities for Dutch museums to bridge this gap. I carried out my research in collaboration with the Chabot Museum, who wants to make their museum more accessible to visually impaired people. The end result, my design, must not only be accessible for women and men, of all ages and with all different types of visual impairment, but also be viable for the context in different museums.

Visually impaired people

In The Netherlands 320.000 people, a sizeable part of the Dutch population, is visually impaired. About 85% of them are 50 years or older. The group of visually impaired people varies widely; visual impairments come in many forms. Having a visual impairment affects many aspects of daily life, ranging from practical, technical problems to psychological and social problems. For example, social exclusion and being dependent of others are experienced as key disadvantages.
Visually impaired people wish to take part in all facets of life and be socially involved. They want to experience and enjoy the things and activities around them on an equal level as sighted people: equal chances in what society provides to the public, including art. The role of art is important in society for many reasons. Art addresses knowledge about history and humanity. It communicates important messages, incites new questions and provokes curiosity, excitement and outrage. At the same time, art adds to the well-being of people. It can help overcome depression, help people to express themselves, create meaningful interactions and adds beauty and pleasure to the world.

**The current museum context**

The purpose of museums is to enable all visitors to enjoy its collections, to educate the public and make their collections accessible for everyone.

Existing programs for visually impaired people in Dutch museums comprise of mainly guided tours and multisensory experiences. These tours provide special tools, such as tactile objects; a verbal explanation given by guides, room to ask questions; and social interaction with others. Multisensory solutions include 3D or relief representations of the artwork for touch, combined with verbal explanations such as an audio tour.

Visually impaired people are dependent on the efforts that museums make, the selected art to experience with multiple senses, and the tours they provide. They are dependent on the museums agenda. To get a better understanding of how visually impaired people can explore art, more insights are needed on the experiences and wishes by the target group itself. In the field research I further investigated how visually impaired
people experience and explore art right now, what they would like to get out of their museum visit, and what is needed to achieve this. These insights were the foundation for my design.

**Exploration of art by visually impaired people**

I observed 10 visually impaired people at different museums with their sighted companion, joining special guided tours for visually impaired museum visitors. In addition, I interviewed approximately 10 people of the target audience. All of the visually impaired people that I interviewed like to explore art together with a companion; a sighted friend, family member or partner. They want a playful interaction; going to a museum is mostly seen as a social event. Despite a desire to explore art together, they do not exactly know how to create an equal, balanced experience with a sighted person. Visually impaired people want to have room for their own imagination and interpretations. They dislike it when they are dependent on others’ interpretations of the artwork. They do not want to experience art only through the eyes of a sighted companion.

Special guided tours for visually impaired people are experienced as both positive and negative. Visually impaired people join special guided tours because they like the guidance to get a deeper understanding of the artworks, than when they would go independently. They can ask questions, socially interact with others (equally) and use special tools provided specially for them. At the same time, guided tours can be stressful or annoying. Visually impaired people have different needs in speed, explanation and guidance. And most importantly, they do not like to always be dependent on the museums agenda or fixed schedules. Being independent of when to go, and free in choosing what artworks to explore, is important.
to feel equal like other visitors. In most cases, there are no possibilities provided to explore by themselves or to experience art together in an equally interesting way with their sighted companion.

In order to experience the value, essence and richness of an artwork, visually impaired people put a strong emphasis on the use of multiple senses. Audio and touch are mostly used. According to most visually impaired museum visitors hands are useful indispensable, vital tools when exploring, since they can be used in multiple ways. A verbal explanation together with a touching experience (touching an object, relief drawing, artwork or replica) increases a deeper understanding of the artwork and enriches the experience.

**Exploration of art by sighted people**

Unlike visually impaired people, sighted people are able to visit any museum of choice and explore artworks as they prefer. One way is to wander and look around casually, another is to get a closer look and try to analyse an artwork to understand the essence. Art historian, Erwin Panofsky introduced a principle on how people analyse art. This principle consists of 3 layers:

1. ‘Look’, where people observe an artwork and only gather visual information;
2. ‘See’, where people apply meaning to what is observed;
3. ‘Think’, where people think about what is observed and seek to broaden the meaning of the artwork (Messham-Muir, 2014).

Another interesting way to unpack the meaning of an artwork is done with a learning method called ‘Visual Thinking Strategy’ (VTS) by Philip Yenawine. VTS teaches people to observe, listen to and build on each other without judgment when looking at works of art (VTS, 2020).
Sighted and visually impaired people exploring art together
There is not much designed for social interaction between visually impaired and sighted people in a museum. In order for me to find out how they want to explore art together, it was important to understand their collaboration. Visually impaired people rely on word choices, story-telling and explanations skills of their sighted companion. They often are coloured by the interpretations of the sighted person.

The principles on how to observe (without judgement) and analyse the artwork (VTS and Panofsky), in combination with multi-sensory tools, could help to design for a collective museum experience, where they are able to communicate and explore art in an equal way.

In this way both learn new things. Visually impaired people can receive pure visual information through observational techniques. Sighted people can learn from using other senses than sight as well. Both get a deeper understanding by talking to each other, seeking for the underlying meaning and building knowledge together.

Conclusion: In addition to exploring with multiple senses, visually impaired people like to visit museums together with others (sighted people), equally balanced, and independent from museum agendas or guided tours.

This resulted in the following Design Goal:

“To design a tool that assists visually impaired museum visitors and their sighted companion, to explore 2D artworks of choice, in an equally balanced, rich explorative and playful way, during an independent museum visit.”
Independent museum visit

Equal experience

Playful interaction

Guidance

Social Interaction

Assisting Tool

Guidance

Sighted companion

Visually Impaired companion

Rich Exploration

Interesting information to create understanding

2D Artwork of choice

Figure 1: The desired situation.
How users should eventually benefit from the design, is set out in figure 2. The arrows in the figure show the interaction between the artworks and the people.

The key design requirements, derived from my literature and field research, are summarized in the following themes:

General, Independence, Social Experience (Balanced, equal visit and Inclusion) and Rich explorations (Learning new things, Flexible solutions, Multisensory aspects).

**Design: concept development and prototyping**
From all the ideas gathered in the ideation process (including a group brainstorm session with the target audience), the most promising design turned out to be a toolkit with guidelines and tools on how to explore art together for visually impaired and sighted companions.

Not only did this idea score highest on the different design requirements; experts that I interviewed also saw great potential in the toolkit. They appreciated the creation of a joint experience, that it is independent from any museum provided tool, employee or agenda, and its possibilities to allow exploration by “the self” (describing, drawing, mimicking, questioning), like with the method VTS. This strengthened my motivation to prototype and develop the toolkit idea, as it seemed the most fitting and inspiring direction.

The toolkit is inspired by the 3 layers of Panofsky’s principles to unpack the meaning of an artwork: 1. Looking (observation: gather visual information), 2. Seeing (applying meaning to what is observed), 3. Thinking (thinking about what is observed and interpretation) (Messham-Muir, 2014). See figure 2.
<table>
<thead>
<tr>
<th>LAYERS OF PANOFSKY</th>
<th>THE TOOLKIT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Layer 1: Look</strong></td>
<td><strong>Describing the artwork</strong></td>
</tr>
<tr>
<td>Observation: gathering visual information.</td>
<td></td>
</tr>
<tr>
<td><strong>Layer 2: See</strong></td>
<td><strong>(Tactile) Drawing the artwork</strong></td>
</tr>
<tr>
<td>Applying meaning to what is observed.</td>
<td></td>
</tr>
<tr>
<td><strong>Layer 3: Think</strong></td>
<td><strong>Enacting the artwork</strong></td>
</tr>
<tr>
<td>Thinking about what is observed. Interpretation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Talking about the artwork</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Touching the artwork</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Optional: Reflect on interpretations, with ‘right answers’</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Listening to background information about the artwork</strong></td>
</tr>
</tbody>
</table>

*Figure 2: The layers within the toolkit, inspired by the layers of Panofsky and VTS.*
Relevant insights from prototyping the different toolkit aspects:
Sighted participants experienced joy in describing artworks (images) to visually impaired people and visually impaired participants enjoyed listening to image descriptions by their companion. Both found that they learned and discovered new things in the artwork. The step-by-step guidelines added to an easy and relaxed museum visit, as long as the visually impaired felt part of the decision-making process. Drawings were considered insightful and helpful to understand shapes and composition. Question cards ignited creativity and started conversation quickly. Touching different materials and fabrics, helped to communicate about the textures, colours and even emotions in the artworks. Mimicking the artwork gave both insights on emotion, as well, as body sensations from characters in the artwork. Overall the need for simplicity was stressed, both in the steps to take and in the layout of the design.

My final concept design
The learnings from prototyping in relation to the design requirements, resulted in my final concept design “Eye can(t) see art”. This is the toolkit consisting of:
1. A manual with instructions;
2. Image description cards (with guidelines) on a keycord;
3. Drawing cards (with guidelines) on a keycord & a drawing-pad with tactile paper and a pen;
4. Feel cards (with guidelines) & material/fabric swatches on a keycord;
5. Mimic cards (with guidelines) on a keycord;
6. Question cards (with guidelines) and questions to answer on a keycord;
7. The application for smartphones (including audio instructions, and an option to get background information of an artwork).
1. Reading the instructions manual.

2. Downloading the app.

3. Describing the artwork with the describing cards.

4. Asking questions with question-cards

5. Tactile drawing with the drawing pad on tactile paper.

6. Feeling the tactile drawing.
7. Enacting with the mimic cards.

8. Using the material swatches.

9. Scanning the artwork for background information.

10. Listening to background information.

Figure 3: The ‘Eye can(t) see art’ toolkit components.
The value of the design in brief: The playful and interactive tools are aimed at assisting people with different visual impairments to explore art together with their sighted companion on an equal level. They can do this independent at any time, at any museum and for any type of artwork. Visitors can bring the card set to any museum of choice, whenever they like. It helps them to interact socially, start dialogue and exchange thoughts about artworks on an equal level. Visually impaired and sighted visitors will get and discover equally interesting information of the artworks.

Because of the playful educative interactions, the users feel stimulated, challenged, curious or proud. This way they get more out of their museum visit. The tools include multi sensory experiences (describing, (tactile) drawing, enacting, talking, touching) for all different levels of impairment and for people with sight. The cards guide users step by step. At the same time, the toolkit is designed in such a way that interaction between sighted and visually impaired visitors leaves room for own imagination and interpretation about the artwork.

Validation
I carried out a usability test with the target audience, aimed to validate the design requirements, design goals, interaction vision, overall satisfaction of the design and user friendliness. The user tests were conducted with 5 duo’s, of which 3 duo’s had a participant with a visual impairment. The other two duo’s were asked to put on modified glasses or VR goggles, to enact an visual impairment. Overall, the 5 duo’s expressed their enthusiasm for a concept that they expected to have a huge impact on their museum visit. They were actively engaged, enjoyed using the toolkit and found it very insightful. Analysing the artwork; seeking for answers themselves (instead of being
given background information from the start) provided them with pride, once they discovered something new. They mentioned that exploring in such a way would help to keep a longer lasting memory of the artwork. The small, easy to follow steps and minimalistic layout made it easy for users to follow and understand. The guidelines gave clear instructions, all testers were confident what steps to take next. At the same time they said it would take quite some time to use the toolkit, you need to put some effort in there to get the best out of it. They mentioned that the toolkit could work at any museum and for any artwork, but abstract works of art take a bit more effort and practice to describe without any interpretations.

**Interaction**

Participants complemented and included each other well. The cards stimulated teamwork. The sighted and visually impaired participants started conversations easily and both exchanged thoughts and perspectives. Participants stated that the toolkit helps to paint a more complete picture of the artwork together. All sighted participants learned new things from visually impaired companions and vice versa: both discovered new things due to each other’s different perspectives and both learned new techniques on how to communicate on an equal level. Participants said they felt equal to their companion because of the divided tasks. They mentioned they will always look at art differently now.

**The toolkit as a whole**

The toolkit consists of multiple components, for most participant much to carry around. Important was to read instruction carefully and follow the steps, because when they did not do that the effect of the toolkit was not optimal.

For all participants the guidelines and examples on the
describing cards helped to communicate about what they observe in the artwork, objectively. It does take practice to make right word choices and to not make any interpretations, especially for abstract artworks.

Tactile drawing helped to communicate composition, build the image further after describing and helped to get rid of any interpretations that the sighted companion laid on the visually impaired participant.

The material swatches helped to: make the artwork come to life; discuss about textures and even communicate the emotional expressions and colours of the characters in the painting.

The question cards started conversations easily about: their associations with for example music; their connecting emotions; memories; and personal perspectives.

Enacting helped to: experience physical sensations of the characters from the artwork; communicate shapes with hands; feel the emotions of the persons in the painting; and understand actions between objects, figures and persons.

The background information from the app helped to confirm or discuss own interpretations, reflect on own findings. This was found as rewarding.

**Recommendations and future perspective**

*Communicating the purpose to the audience*

The purpose and value of the toolkit should be communicated with the audience from the start. Users should know what they are able to do with the toolkit and what affect it can have on their museum visit. Instructions and examples need to be pointed out clearly, in different
forms, in order to use it appropriately. This could be done with the written manual, the audio instructions in the app and an interaction video on the website or social media page. Once they know what the toolkit consists of, they can perform and use the toolkit at its best. After using it a couple of times they will get to know the toolkit better and get even more out of it.

The toolkit lay out
The toolkit should be provided in different forms, in order for the users to choose what suits them best. The design could make changes in making the description cards smaller (since they are for sighted people); print some of the cards double-sided; replace the question cards completely for the app question function only; make material swatches smaller; make the drawing pad even more compact; use fewer key-cords.

Use of the toolkit long-term
The drawing pad (with the special drawing sheets) and the material swatches are physical parts of the toolkit that always will be needed. The critical questions as cards or on the app as well. However, long-term use can only tell if the guidelines will be needed as much after using it a couple of times.

Ideas and expansion options for the toolkit parts
The toolkit could be expanded in the future, such as adding new themed cards (besides drawing, feeling, questions or mimicking). Also, questions for the question cards could be added, new material-swatches could be made, maybe making more of a distinction between abstract and figurative art. Furthermore, tools to create shapes could be added, like kneadable objects or bendable wires. The app could also be developed further. It could be connected to an online community to share
artwork descriptions, questions and/or drawings with each other.

The toolkit for other purposes and contexts
The toolkit might also be interesting to teach (sighted) children, on how to look at and analyse artworks critically with the use of multiple senses. It can also work for museum tour guides, helping them to guide visually impaired people. Thirdly, sighted museum visitors can use it as well: make them analyse artworks together with other visitors and teach them new techniques to look at art differently. The toolkit possibly works for groups of 3 to 4 people as well. Furthermore, the toolkit can also be used in a different context and for other visual objects, besides 2D artworks, think of: painted ceilings in churches; statues on squares or in parks; and architecture.
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Glossary

List of Abbreviations
AR Augmented Reality
CBS Centraal Bureau voor de Statistiek
DG Design Goal
IDE Industrial Design Engineering
IV Interaction Vision
PMI Plus, Minus, Interesting method
RCE Rijksdienst voor het Cultureel Erfgoed
RG Resource Group
UN United Nations
VIP Visual Impaired Person
VIPs Visual Impaired People
VR Virtual Reality
VTS Visual Thinking Strategy

List of Definitions

Autoethnography
a form of qualitative research using self-exploration to connect with the social and cultural meanings and understandings of a particular audience (the target audience). Experiencing and writing about that experience helps to place the self within a social context of another.

Brainwriting
a group-structured brainstorming technique to quickly generate ideas in parallel. Each person writes ideas on paper, without talking, and passes the paper to the next person. The idea is to get triggered by ideas of others, create new ones or refine their own.
Brainstorming
a method for generating ideas to solve a design problem.

Cluster
a number of similar things, things of the same kind, that occur together.

Creative Session
A group session using creative problem-solving techniques to define a problem and generate ideas.

Concept
a principle or idea.

Design Brief
a document for a design project developed by a designer or design team in consultation with the client. Design briefs are also used to evaluate the effectiveness of a design after it has been produced and during the creation process to keep the project on track and on budget.

Design Requirements
are the functional attributes that enable the designer or design team to convert ideas into design features. Design requirements show what elements and functions are necessary for the Design.

Design Goal
a specified design challenge.
Generative Session
a group session using creative problem-solving techniques to define a problem and generate ideas.

Interaction Vision
an inspiring analogy (written in words or shown in images) that address the way of interacting with the designed product or service.

Personas
fictional characters used to represent the target group. These characters briefly communicate the goals, motivations, attitudes and behaviours of visually impaired people in the museum context.

Prototype
an early sample, model, or release of a product built to test a concept or process.

Replica
an exact copy, such as of a painting, as it was executed by the original artist or a copy or reproduction.

Target Audience or Target Group
potential users, the demographic of people most likely to be interested in your product or service.

User testing
a technique used to evaluate a product by testing it on users.
Figure 4: The Chabot Museum in Rotterdam.
1. Introduction of the context

This report is the result of my graduation project on art accessibility for visually impaired museum visitors. It was created in association with the Chabot Museum, and in the context of the Museum Futures Lab (Faculty of Industrial Design Engineering, Delft University of Technology). This chapter describes the reason and the starting point behind the project. It introduces the topic, the Chabot Museum, the scope of the graduation project, and the report structure.

1.1 Topic

The Netherlands counts 680 museums (RCE, 2020), each of them provides exhibitions of different types of art to show the public. These museums offer many different possibilities in ways to explore their artworks. For a regular museum visitor the choice is up to them, whether they want to walk through the museum by themselves, stroll around with a friend, join a guided tour or listen to an audio tour.

The large amount of visiting possibilities and having a choice on how to visit a museum of choice, is not the same for everyone. People with a visual impairment are dependent on special tours, programs, custom audio tours or special tactile stations. Even though these options are available at some museums, they are by no means accessible at any time, at any museum of choice or to the entire group of visually impaired people.

Problem definition

Worldwide, around 36 million people are blind and 217 million have low vision (Vision2020, 2018). In The Netherlands an estimated 380,000 people have a visual
impairment (Bartimeus, 2014). This means a sizable part of the global population needs to adapt their behaviour to a world of sighted people and this is in need for change (Dupere, 2016).

In December 2006, the United Nations agreed on the rights of persons with disabilities to live independently and participate fully in all aspects of life. Ten years later, in 2016, the Netherlands also adopted the United Nations Convention on the Rights of Persons with Disabilities. Article 9 states:

“Persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas.”

People with a handicap should be able to take part in all facets in life and be able to participate in our society. This also applies to exploring art and visiting museums.

Unfortunately, a lot of art is 2D and mainly for the eyes only. Unlike performing art, auditory art or 3D sculptures, 2D artworks at itself do not communicate information through other senses than sight. “Of the five senses with which we behold the physical world—vision, audition, taste, touch, smell—vision is the faculty that is most directly related to the perception of art: it truly is “the big window.”, according to Solso in a research about the psychology of art and our brain (Solso, 1933, p.73).
in museums that mostly do not (yet) take the needs of visually impaired people in consideration. Much more can be done to integrate this group into the museum audience, (Dimitrova-Radojichikj, 2017). And it is important that we do, because art is what makes us connect to our humanity, our past, to other people and provides beauty in our world (Westwood, 2008). Without these connections and beauty, there is only discontent and anger (Lepore, 2008).

Therefore, this project aims to improve the art accessibility for museum visitors with a visual impairment.

1.2 Client

As a starting point for this project, I approached the museum futures lab at my faculty. Within this lab students explore museum experiences and the role of museum’s in society. Via them I came in contact with my supervisory team, whom connected me with the Chabot museum, since they want to make their museum more accessible to visually impaired people.

I then visited the Chabot museum, to find out more about their museum. In order for me to map out their wishes, goals and issues, I conducted an interview with J. Bijlsma, the director of the Chabot museum. The interview was semi-structured according to a method by Newton (2010). Refer to Appendix 1 for the interview questions.

The Chabot museum
The intimate Chabot Museum in Rotterdam has a varied international programme of exhibitions. The museum presents one of the most important collections of the Dutch expressionist painter and sculptor Henk Chabot (1894-1949). He holds a special place in Dutch modern art as a painter of farmers, gardeners and Dutch landscapes,
as well as refugees and people who were forced into hiding during the Second World War.

**Main take-aways from the interview issues:**
The Chabot Museum is partly inaccessible to visually impaired people. There are no guidelines incorporated on the floors and since the museum is quite small, there are no guided dogs allowed either. Going together with a sighted person, on the other hand, is possible.

The collection mainly exists of paintings in 2D. The artworks are hardly made accessible to senses other than sight, except from some guided tours, where visitors are able to touch the sculptures. However, this is not the case for the 2D art pieces.

**Wishes & Goals:**
The Chabot Museum wants to tell the story of Chabot to their visitors, including visually impaired people. The museum does not particularly want to select one or two artworks to make accessible, but rather communicate the story through a series of works. The museum seemed interested in a solution to make more than a few works accessible to tell the story of the collection.

The collection changes, therefore their goal is to have a mobile and generic solution that would fit more artworks. The Chabot museum wants a solution for different types of artworks.

The museum searches for an innovative solution, new ways for visually impaired museum visitors to access changing collections in a small intimate space.

The museum searches for a solution for visually impaired people to visit their museum independently.
The Chabot Museum wants to be inclusive and take every one of the target audience into account. This means that the design must be inclusive to all visually impaired people who want to visit a museum.

1.3 Graduation Scope

There are different types of art, like abstract or figurative; a range of different forms of art, like 2D or 3D sculptures; and a large variety in museums exhibitions, like contemporary exhibitions or permanent installations. Also, the range of visually impaired people is large.

Previous projects taught me that if a scope is too broad, I was not able to fully engage with the issue. The key, therefore was to narrow my focus. This narrowed project focus, including clear project goals, was formulated at the beginning of the project, in a so-called graduation brief, see Appendix 2. In short, the graduation brief stated the following:

The focus of the project
Focus on one form of art: 2D visual artworks at museums, such as paintings and drawings. Since most of these works are created for the eyes only and not accessible for visually impaired people. This seemed like a big challenge.

Focus on different types of 2D visual art: figurative, abstract, modern and historical. There are many different types of art and changing exhibitions, like Chabot has.

Focus on a museum visit independent from guided tours or programs. Some museums make the effort to provide (guided) (touch) tours, but going through a museum independently is less common than joining guided tours or special programs.
Focus on all (different) visually impaired people. An inclusive museum is for everyone, including all visually impaired people.

**Out of scope**

Navigation issues and accessibility of museum buildings are not included in this project. The project focuses on the artworks and the experience and exploration possibilities of artworks only.

**Project goals**

In the project brief the following research question and goals were stated:

- “How can we make visual 2D art accessible for different visually impaired museum visitors, independent from special tours?”

- To empathize with and research visual impaired people in general.

- To find ways to make art accessible to different museum visitors, with different levels of visual impairment.

- To research art and its role in society.

- To research the museum context and find out what museums offer and lack of, for visually impaired people.

- To research the accessibility of different types of 2D visual art for visually impaired people in the museum context.

- To design an interactive product/service that enables different visually impaired people to experience,
explore and access different 2D artworks at museums independently.

1.4 Report structure
The project is structured according to three phases, based on the double diamond model structure by Council (2005).

![Double Diamond Model](image)

*Figure 5: The project structure (Double Diamond).*

This report is structured into three phases: (1) Analysis, (2) Design and (3) Validation. Each phase has a different approach.

1. Analysis
The analysis phase consists of empathizing with the context, current situation and the needs and desires of the different stakeholders (the target audience and museum). This is done through literature and field research. The insights of this research were translated into several design take-aways. Design take-aways are insights to later be translated into a list of design requirements. As a conclusion from the analysis phase, a design brief was formulated, including: a problem definition, design goal, interaction vision and design requirements (derived from design take-aways). Only the most striking, frequent and
surprising design take-aways were translated into the design requirements.

2. Design
The second phase shows the methods used to ideate and to develop the concept. The results show how iterative design methods were used during ideation and how prototyping and the design brief helped to develop the concept design.

3. Validation
The final concept design is eventually made into a prototype used to validate with end-users (the target audience). The result of the user test is presented and the concept design and its effect are finally evaluated.

Figure 6 shows the steps I took throughout the project. Each arrow represents a step I accomplished. The 3 colours represent the 3 phases. Methods used (and the sources they came from) are shown within each step.

Each abbreviation is a reference to the method source. Below is shown what the abbreviations stand for.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(S)</td>
<td>Sanders, L. (2012).</td>
</tr>
</tbody>
</table>
Figure 6: Project steps I took and the methods I used
Phase 1. Analysis

This phase consists of literature and field research results, followed with a design brief as conclusion of the analysis.
2. Literature research

2.1 Research approach

2.1.1 Literature review and desktop search
Literature research, including a literature review and desktop search, was done to gather information about visually impaired people in relation to art and the museum context. The results of this literature research are described in paragraphs 2 to 5. This chapter provides important background information to answer the research question: ‘How can we make visual 2D art accessible for all different visually impaired museum visitors?’ The literature research also provides input for the field research.

2.2 Visual Impairment

2.2.1 Definition
According to CBS (2020), being visually impaired means having a limitation in vision-related activities. Visually impaired people have great difficulty with or are unable to read the lowercase letters in the newspaper or recognize someone’s face at a distance of 4 meters (Volksgezondheidenzorg, 2020). A visual impairment refers to when you lose part or all of your vision and when the impairment cannot be corrected by glasses, contact lenses, medication or surgery (Maberley, DA. et al., 2006).

2.2.2 Prevalence of visually impairment in the Netherlands
The graph (on page 48) shows the percentages of people with a visual impairment in The Netherlands. Visual impairments occur to 3% of the Dutch population, older than 12 years and are twice as common among women as men (CBS, 2017). Also, visual impairment is unevenly distributed across age groups, it is largely confined to adults aged over 50.
Figure 7: A bar chart with the percentage of visual impairments per age category for men and women (CBS, 2017).

Image description of figure 7: The figure shows a bar chart of the percentage of visually impaired men and women per age category, in The Netherlands. The y-axis displays the percentages of the population (from 0 to 10 per cent). The x-axis shows age categories (12 to 17; 18 to 44; 45 to 64; 65 to 74; and 75+). The bars within the chart are coloured blue for men and red for women.

For ages 12 to 17 the prevalence is 0.1% for male, and 0.5% for female; For ages 18 to 44, respectively 0.8% and 1.5%; for ages 45 to 64, respectively 3.7% and 4.2%; for ages 65 to 74, 3.5% and 4.3%; and for ages 75 years and older, respectively 7.2% and 9%.

Visual impairment includes low vision as well as blindness. 223,000 people from the Netherlands are ill-sighted, which means that a person sees less than 30% (what this percentage means is explained in the next paragraph) (Koninklijke Visio, 2019). About 24% of visually impaired people in The Netherlands are called blind, they see less than 5%. From this group, only 20% is totally blind, with no perception of light (Vision 2020, 2005). This means that
most people called blind, can still see something and that the word ‘blind’ does not always mean that a person sees nothing.

**Design take-away:**
- The design could be accessible for all women and men, of all ages with different types of visual impairment.

### 2.2.3 Classifications

Since this thesis is about the perception of visual art, it is important to distinguish between forms of blindness. The table below gives a classification of visual impairments recommended by the World Health Organization (WHO, n.d.). These classifications are based on two factors: the visual acuity and the visual fields.

Visual acuity is the clarity of vision. This may be thought of as the ability of the eye to see fine detail (Smith and Atchison, 1997). The visual field is the area from which you are able to perceive visual information, while your eyes are in a stationary position and you are looking straight at an object (Williams, Y., 2019).

<table>
<thead>
<tr>
<th>Category</th>
<th>Vision Acuity</th>
<th>Field of view</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Mild or no visual impairment</td>
<td>$\geq 0.3$</td>
<td></td>
</tr>
<tr>
<td>1 Moderate visual impairment</td>
<td>$&lt; 0.3 \ (20/70) \geq 0.1 \ (20/200)$</td>
<td>$\leq 30 - &gt; 20$ degrees</td>
</tr>
<tr>
<td>2 Severe visual impairment</td>
<td>$&lt; 0.1 \ (20/200) \geq 0.05 \ (20/400)$</td>
<td>$\leq 20 - &gt; 10$ degrees</td>
</tr>
<tr>
<td>3 Blindness</td>
<td>$&lt; 0.05 \ (20/400) \geq 0.02 \ (20/1200)$</td>
<td>$\leq 10 - &gt; 5$ degrees</td>
</tr>
<tr>
<td>4 Blindness</td>
<td>$&lt; 0.02 \ (20/1200)$ and light perception</td>
<td>$\leq 5$ degrees</td>
</tr>
<tr>
<td>5 Blindness</td>
<td>No light perception (NLP)</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 8: This table shows the classification of visual impairments, according to WHO (n.d.).*

Figure 8 presents the visual acuity for each category. The
numbers in between brackets show how the visual acuity is measured, also as displayed in a Snellen chart (figure 9). The categories go from mild vision loss to total blindness.

There are a number of ways to measure and define visual acuity. For distance vision, the visual acuity is normally measured using a Snellen chart (Smith and Atchison, 1997).

Figure 9: A typical Snellen chart that is frequently used for visual acuity testing (Schneider, J., 2002).
Visual acuity is calculated by using two numbers. The first number indicates the distance between the chart and the person reading the chart. The second number is the distance that someone with normal vision is able to read at 20ft. distance from the chart. People with normal vision can read the 20 ft line at 20 ft., a 20/20 visual acuity. For example, a visual acuity of 20/80 means that a person with normal vision would see from 80 feet away, you cannot see until you move closer to only 20 feet away (Williams, Y., 2019).

Figure 8 shows that a person is categorized as blind when they have a visual acuity lower than 0.05 (20/400 form Snellen Chart), which means people from categories 3, 4 and 5. Even if people from categories 3 and 4 still have little vision or light perception they are categorized as blind.

Throughout this thesis is referred to a new proposed revision of the categories. This distribution has been adopted in order to clearly refer to the differences between the visual impairments of the participants, interviewees (people I interviewed) and observees (people I observed) from the field research (see chapter: ‘Methods’ for further explanation). These categories have been used to easily distinguish between the people involved during this project and to use as a guideline for the design phase. However, it is important to mention that there is no strict line between these visual limitations, the transition is gradual.

The proposed revision of categories of visual impairment in this thesis are, also according to Oogfonds (2019):

- **Ill-sighted** is defined as visual acuity of less than 0.3 (20/70), but equal to or better than 0.05 (20/400). They still see light and the outlines of people and objects.
• **Legally blind** is defined as visual acuity of less than 0.05 (20/400), but equal to or better than 0.02 (20/1200).

• **Blind and totally blind** is defined as visual acuity of less than 0.02 (ICD-10 visual impairment category 5). Being totally blind means seeing nothing, not even light.

**2.2.4 Types**
There are many types of vision impairments. Some people cannot see clearly, others see all sorts of dark spots, and some people can only see what appears directly in front of them and nothing at the sides (Visio, 2019). Some see poorly in the dark, while others see better in twilight than in bright light. Visual impairments are usually caused by an eye disease that damages parts of the retina or optic nerve, like cataract, the most common disease in the Netherlands (Oogfonds, 2019).

Figure 10 shows some of these different forms of visual impairments, through simulation photos.

**Design take-away:**
• The design could take the differences in vision between the different visual impairments into consideration for layout and design choices.

**2.2.5 Problems**
Having a visual impairment has consequences for daily activities, ranging from very practical technical problems to psychological and social problems (Bartiméus, 2015). Together these problems affect one’s quality of life (Lamoureux and Pesudovs, 2011, p. 195). This means that these problems can have a big impact on finding a balance between body and mind; and, establishing and maintaining relationships within a social context and external
Figure 10: Simulation of different visual impairments.
environment (Albrecht & Devlieger, 1999).

The type of visual impairment, the symptoms of the impairment, the emotional well-being, the social relationships of that person, their concerns and convenience, are all aspects of the quality of life affected by vision (Lamoureux and Pesudovs, 2011). And thus, activities like visiting a museum, as a visually impaired person, also presents obstacles.

This paragraph describes the different problems that can occur to people with a visual impairment and how it affects their quality of life. It is important to mention that the group of visually impaired people varies a lot. Therefore, the challenges mentioned below might not apply to all visually impaired people.

The scope of this thesis focuses on those aspects of quality of life that (possibly) play a role in the museum context and whether this is taken into account in the design process. They are presented as design take-aways.

1. Dependent on others
Vision loss affects numerous daily activities. A regular museum visit for visually impaired people mostly depends on (the help of) others. According to a paper by Asakawa, a blind Japanese computer scientist, it is the lack of independence that discourages visually impaired people from visiting museums more often (Asakawa, 2018).

First, visually impaired people are dependent on the schedule and type of special programs, like multi-sensory guided tours, museums provide. In The Netherlands, for instance, you see that museums vary in their programs. Only a very limited number of Dutch museums offer special tours for visually impaired on a regular basis, if at all.
Moreover, visually impaired people are then dependent on the expertise level of the guide. Guides are responsible to translate the information in a correct way, make the collection attractive, accessible and interesting (Hartjes, M., 2018). Visual impaired visitors rely on word choices, story-telling skills, explanations skills of the tour guide and the quality of used tools to trigger other senses in order to paint their own visual image. “The quality of the visual descriptions is highly dependent on the person providing them” (Asakawa, 2018, p.382). Unfortunately, these variables have an all-important impact on their imagination and museum experience. A study by Asakawa (2018) showed that the over-reliance on the intermittent availability of specialized guided-tours discourages visually impaired people to visit museums more often.

Thirdly, alternatives from guided tours or audio description tools, to provide descriptions of visual information, are family and friends. Still, the experience depends on their ability to provide good descriptions (Asakawa, 2018). A participant of this study stated: “ ‘It depends on who you go with. Some people are very expressive and they are very descriptive. But other people are...not really giving me much...They don’t know exactly what I wanna know’. In addition, several participants stated that they do not want to be a burden to their sighted companions”, (Asakawa, 2018, p.383).

The above cases show that a person with vision loss is dependent on other people’s skills on how they experience the art and their museum visit.

**Design take-away:**
- The design could be able to be used at least partially or
as a whole independently by a visually impaired user in a museum.

- The design could make an independent visit to a museum possible. By independent meaning separated from special guided tours or other fixed-agenda programs.
- The design could not be dependent on a guide of the museum in order to be used and understood by a visually impaired person.
- The design could make the artwork experience for visually impaired museum visitors independent of the knowledge or skills of other people, in order to explore artworks.
- The design could help visually impaired people be equal to their companion, friend or family member, during their museum visit.

2. Mobility issues
Mobility is a problem because the primary sense used to navigate is vision (Bibby et al., 2007; Lord and Dayhew, 2001; Marron and Bailey, 1982). Most visual impaired people still find mobility obstacles at most museums, with regard to accessibility (Looijkens, B., 2017, p.11). Visually impaired people, therefore, use tools to be more mobile and help to navigate, such as a white cane, a dog, special guiding lines or navigation apps. Unfortunately, not all of the tools out there are easy to use. Neither do all museums provide, have access or allow visitors to use them. This makes moving around inconvenient, hard and sometimes even impossible for visually impaired people.

This thesis does not focus on mobility or navigation, so this will not be further investigated. However it is important to keep in the back of the mind when designing later on.
Design take-away:
• The design could be easy and convenient to use while navigating or when moving around in the museum.

3. Place in society
Many visually impaired people feel excluded from social situations and public places. They want to be treated like anyone else, live their life as normal as possible and be able to do activities with sighted people as well (SSMR, 2009). If blind or partially sighted people cannot learn to understand the visual aspects of the world, there is a chance that they will end up in social isolation (Duives, 2016). Visually impaired people want to be socially included (Candlin, 2003).

Compared to people with normal vision, those with vision impairment are at a higher risk for depression, anxiety, and other psychological problems (Kempen et al., 2012). Especially when they feel excluded, inclusion is therefore important too.

People with a visual impairment who are interested in art would like to know what a work looks like. For some works though, it can become very difficult to understand or talk about with sighted people. This undesirable inability to participate in certain conversations and therefore parts of society can lead to worrying situations (Looijkens, B., 2017).

Design take-away:
• The design could approach the visually impaired user on an equal basis as the sighted user. The design could provide an equal part in use for the visually impaired user as for the sighted user.
• The design could make conversations about artworks possible between sighted and visually impaired museum visitors for social inclusion.
2.2.6 Use of senses
People receive information in different ways, which can be divided into three categories: visual (sights, pictures, diagrams, symbols); auditory (sounds, words); kinesthetic (taste, touch, and smell) (Felder & Silverman, 1988).

Blind people interpret information of the world around them by using the other four senses besides vision: audition, taste, touch and smell. Legally blind and ill-sighted people, however, might also use their remaining sight or perception of light (Bautista, 2011).

There are few differences between how early blind and late blind people perceive touch and audio. Though, the memory performance for sounds was stronger for early blind participants than for late blind (Cornell, 2016).

According to L. Ayer (2016) touch is the sense that ‘educates’ vision and hearing. She says: “We could be looking at something that we know is ‘soft’, but the only reason we really KNOW this, is because we have touched it or something like it, and thus learned the concept of “soft”. Vision didn’t teach us this.” With haptic perception we receive somatosensory information from touch (providing information like hardness, texture, temperature and weight) and from proprioception (providing spatial and motor information) (Rlchardson, M., 2008). The information of touch is involved in the left hemisphere of our brain. It processes what is being touched, form recognition; and also fine details (Ayer, 2016). The “what” system processes surfaces, objects, and their many different properties. This means that some form of haptic experiences (tactile representations) explored by active touch, is needed to provide valuable information of an artwork for visually impaired people.
Hearing, also, is a major source of information for someone who is visually impaired. Listening provides information about the immediate (what is in front of them) and extended environment, which can be helpful in orientation and mobility skills (Willings, C., 2019).

Auditory information also enhances the tactile experience. Touch can be especially effective in conveying shapes forms and textures, used with verbal description, (Salzhauer Axel, E., 2002).

Thus, without or with little visual information of an artwork, visually impaired people need auditory and kinesthetic information to communicate the essence of an artwork.

**Design take-away:**

- The design could tap into vision differences of ill-sighted and legally blind users for them to use their remaining sight.
- The design could include auditory and tactile tasks/experiences.
2.2.7 Tools
In order to live as independently as possible, many people with a visual impairment use tools, such as a guide dog and a white cane. But there are many more. Think of using remaining vision with: (electronic) magnifiers, magnifying glasses, the camera zoom-function on smartphones or telescope glasses, a tactile drawing board or reading braille. Some examples of tools for visually impaired people are shown in figures 11 to 17.

Magnifiers
Magnifiers are used to enlarge text. There are magnifying glasses and electronic magnifiers, capable of offering a variable magnification ranges.

Figures from left to right:
Figure 11: Magnifying reading glass (Vision Australia, n.d.).
Figure 12: Electronical magnifier (Maxiaids, n.d.).

Scale models
Scale models are used at some public buildings to navigate and to get to know the spatial environment.
Figure 13: Hannes Walraffen holding a scale model of The Rijksmuseum building in the hall of Rijksmuseum (Gerritsen, R., 2018).

Tactile maps
Tactile maps are used to navigate.

Figure 14: Visually impaired person touching a tactile map of Utrecht central station (ProRail, 2017).
Braille
Braille is mainly used by people who are born blind or have become blind at a young age (Oogfonds, 2019). Approximately, only 3000 people in The Netherlands can read braille (Aukema, S., 2009)).

![Figure 15: Braille reading (American Foundation for the Blind, n.d.).](image)

Tactile relief drawings
Tactile relief drawings are used to provide information, for example, to teach children and students at school.

![Figure 16: Tactile relief drawings of the Eiffel Tower, a teddy bear and a painting of Monet. In different school and student books (eduVIP, 2017).](image)
**Tactile sketching pads**
Tactile sketching pads are used to make tactile drawings for visually impaired people.

![Tactile sketching pads]

*Figure 17: Intact sketching pad for visually impaired people (inTACT, 2019).*

**Design take-away.**
- The design could be allowed at a museum, so it could not include tools restricted from museums or could give alternatives for forbidden objects.
- The design could include other ways than or besides braille to provide information of an artwork. The design could be an inclusive design and provide opportunities in use for the whole target group (different people with different visual impairments).
2.3 Art and its role in society

2.3.1 Definition
According to the Oxford dictionary, the art [noun] is defined as:

“The expression or application of human creative skill and imagination, typically in a visual form such as painting or sculpture, producing works to be appreciated primarily for their beauty or emotional power.”

This definition shows that art expresses itself in a visual form. This is when we speak of visual arts (such as painting, sculpture, film and photography) (Stevenson, A., 2010).

Visual art can be divided into two: plastic arts and performance arts.
‘Plastic arts’ includes two categories: (1) Fine art like a drawing, painting, printmaking, sculpture; (2) Literature: poetry, creative writing (Bagdasaryan, 2000).

‘Performance arts’ are arts done by humans in action, including drama (expression using the body: dance, acting, singing) and auditory art (expression by making sounds): music, singing (Bagdasaryan, 2000).

This project, as mentioned before, focuses on 2D fine art, like drawings, paintings, prints and photographs.

2.3.2 The impact of art on people
Why is art important and what is its impact on society and people? This paragraph states some, but not all, of the key reasons.

Art is part of humanity
Art is important because it connects us to the past and our
own humanity (Westwood, 2008). Art can educate us about our history.

**Art reflects on our society**
Art is a reflection of our society, because it is a way to understand the time period, by seeing what artists are expressing (Westwood, M., 2008). Like Bagdasaryan questions: “What message, criticism or political change did the artist wish to achieve?” (Bagdasaryan, N., 2000). Think of artists that make everyday political dilemmas visual and questionable to the public, in the form of art, such as street art. Many communities clearly value the aesthetic qualities and political commentary provided by Banksy’s work (Hansen, 2016). Street art, like Banksy’s, nowadays positions itself as a valuable asset to the community, rather than a crime or social decline (Hansen, 2016). Art can communicate important messages, incite new questions and provoke curiosity, excitement and outrage (Ibrahim, A., 2019).

**Art is positive for the well-being of people**
Art can bring positivity according to recent scientific findings of how images influence emotion, thoughts and well-being. Also, how the brain and body react to the experience of drawing, painting, or other art activities shows that art therapy may be effective with a variety of populations. Moreover, according to Malchiodi’s study, art can help individuals overcome depression: “…art did help him overcome his often-severe depression, find a release from his illness, and discover and nurture a sense of well-being” (Malchiodi, 2003, p. 16-24). The joy of creating art has a positive influence on well-being as well.

**Art is a way of self-expression**
Art allows people to express themselves in ways that words cannot (Ibrahim, A., 2019). Ibrahim claims that art allows
people to express themselves in different textures and styles that are not an option in many other areas of life.

**Art adds beauty and pleasure to the world**
Another reason why art is important, according to Lepore (2008) is that people need beautiful things to look at, experience and enjoy. Without beauty, there is no pleasure and without pleasure, there is only discontent and anger, he adds.

**Art connects people**
Most certainly, it connects the artist to the audience and art can connect strangers with similar passions (Council of Europe, 2017). Art is like a universal language that brings people together (Addis-Gutierrez, 2010).

### 2.3.3 Art is for the eyes
All of the above reasons apply mainly for visual art, so for sighted people in our society. “When talking about art, we put huge emphasis on just one sense: sight. The message is almost that if you can’t see, you can’t experience art” (Davison, 2014). Different people state that art (of any form) is mainly for the eye, like Solso says: “Art is, after all, physical material that affects a physical eye and conscious brain. Art is a perception consciously experienced and defined by human beings as aesthetic” (Solso, 1933, p.15). As well as he states that: “.. of the five senses with which we behold the physical world—vision, audition, taste, touch, smell—vision is the faculty that is most directly related to the perception of art: it truly is “the big window”” (Solso, 1933, p.73).

And like the artist, Paul Cézanne claims in a poem that paintings are first of all, optical.
Painting is, first of all, optical.

That’s where the material of our art is: in what our eyes think.

Nature, when we respect her, always tells us what she means.

- Paul Cézanne

But, since one in five people (in The Netherlands) is interested in art or takes part in the artworld, this means that 64,000 of 320,000 visually impaired people in the Netherlands (Visio, 2016) would be interested in art (Looijkens, B., 2017, p.11). Therefore we can say that art should be for more than just our eyes, to include those that are not able to see. Like, Stichting unlimited enjoyment states: “Art and culture touch, motivate and emotionate. Everyone is entitled to that, right?” (Stichting unlimited enjoyment, Hilversum, 2019).

Design take-away:
- The design could create a way to involve visually impaired, interested in art, into the visual art world.

2.3.4 Artwork experience for sighted people
The only way to understand a painting is to go to the museum and look at it. That is what the French painter Pierre-Auguste Renoir claimed. But once inside of the museum, it turns out to be easier said than done. Anyone can wander and look around, but to really be touched by an artwork does not just happen (Idema, 2014).

Accordingly, how do we dive deeper into a piece of art? How can we understand art? To understand an artwork; looking, seeing and thinking is required. This is adapted
from an old technique by an art historian Erwin Panofsky. According to him there are three steps (later referred to as layers) to unpacking the meaning of an artwork: 1) Look, 2) See, 3) Think (Messham-Muir, 2014).

The first two steps are about using the eyes and observational skills only. The third step requires thought, building on what we already know and creatively interpreting what we have observed within an artwork’s broader contexts (Messham-Muir, 2014).

According to Messham-Muir it is not obvious we do the first two steps, even though we might think so. When sighted people visit an exhibition, they tend to spend only a few seconds in front of any work (Messham-Muir, 2014). Also, according to a paper from 2006, by Leder, about the time spent on artworks per visitor, typical (sighted) visitors spend less than 1 minute viewing time per artwork. On average, people were found to spend only 27.2 seconds per artwork. “This inevitably results in a rather shallow inspection of many artworks”, Leder adds. Given that a long presentation time is above 90 seconds (Leder, 2006).

Thus, the first step of Panofsky, ‘Looking’, is mostly skipped by people, since they do not take the time for it.

The second step is: seeing. But what is the difference between looking and seeing? “Looking is about literally describing what is in front of you while seeing is about applying meaning to it. When we see, we understand” (Messham-Muir, 2014). But, also for this second step, according to some research, people tend to not even see when they look. Mack & Rock, in a study about inattentional blindness, say: “Almost everyone at one time or another has had the experience of looking without seeing...” (Mack & Rock 1998, p.2). Also Koenderink (n.d.)
states: “most people with sight not even really look at art”.

Then, step 3 involves thinking about what you have observed. This step is about connecting what you have learned from the first two steps. This is a process of interpretation, without any science or finding the “right answers”. It is about thinking creatively about the most plausible understandings of a work (Messham-Muir, 2014). If you do not look and see, you cannot think deeper and understand the artwork.

On the other hand, not everyone wants to follow all the steps for each painting. “So here’s an important tip – you don’t have to look at (or like) everything (Messham-Muir, 2014). It is important that you choose what you want to understand (Messham-Muir, 2014).

There are many ways to connect with art beyond our sense of sight. According to Sjahrial, everyone can get a deeper understanding of an artwork, if we use other senses too (Sjahrial, 2018). And like Davison claims: “For any art lover, using more than one sense provides a much richer understanding” (Davison, 2014).

Visually impaired people want to have a similar experience like sighted people do. As well as they want to experience together with sighted people. Therefore it is meaningful to look into ways how sighted people approach an artwork, like with the principles of Panofsky. Another technique to understand an artwork is the learning method: ‘Visual thinking Strategy’ (VTS) by Philip Yenawine. VTS is a learning method which teaches people to perceive, observe, listen to and build on each other without judgment by looking at works of art (VTS, 2020). The benefits from the VTS-method is that people: are actively engaged: seek to find answers (instead of being
provided with them) which stay longer with them as a vivid memories; work together, because together they know more; build on each others observations and knowledge to paint a more complete picture; the more often groups do this, the more proficient they become (Verwijs, C., 2019).

VTS can be placed within the first layer of Panofsky’s layers: ‘look’, because VTS is about what you see (observing what is there) in the artwork, without judgement, with an emphasis on doing it together.

These principles on ‘understanding an artwork’ might help me to design for visually impaired people and their sighted companion. Which means, the following layer could be implemented or the base of my design: 1. Looking (observation: gather visual information, without judgement: VTS), 2. Seeing (applying meaning to what is observed), 3. Thinking (thinking about what is observed) and interpretation.

**Design take-away:**
- The design could tap into the ‘three layers of Panofsky’ on how to understand art (Panofsky’s layers: 
  1. Looking (observation: gather visual information, without judgement: VTS),
  2. Seeing (applying meaning to what is observed),
  3. Thinking (thinking about what is observed and interpretation).
LAYERS OF PANOFSKY

Layer 1: Look
Observation: gathering visual information.

Layer 2: See
Applying meaning to what is observed.

Layer 3: Think
Thinking about what is observed. Interpretation.

Figure 18: Layers of Panofsky.
2.4 The museum context & inclusivity

This chapter focuses on why and how a museum should be inclusive. What does an inclusive society look like? Furthermore, the museum context in The Netherlands is researched. The existing special programs, tours and tools for visually impaired museum visitors provided by museums, are shown. Lastly, the accessibility issues of artworks and the reasons behind them are described.

2.4.1 Inclusive society & the responsibility of museums

Society has a responsibility to include everyone. Like stated in the UN agreement: "People with disabilities have the right to have an equal participation in public life" (UN, Convention on the Rights of Persons with Disabilities, Article 29). Museums are for the public and share this responsibility.

Moreover, visually impaired people have the right to equal education and participation in the art-scene to develop knowledge of art (UN, Convention on the Rights of Persons with Disabilities, Article 24). Museums have a social responsibility to educate the public and make their collections accessible to everyone.

Furthermore, article 30 states that the rights of a person with disabilities is to take part on an equal basis in cultural life, enjoy access and services like everyone else. Museums can bring people in the community together, promote social activism, and develop programs aimed towards creating positive changes within communities (Sirhall, 2015).

Although programs for visually impaired museum visitors have appeared at some places, it seems that not much
has been done to integrate this group into the museum audience (Dimitrova-Radojichikj, 2017).

So, for this design research, the aim is to create a design that helps museums to be more inclusive. A design which connects visually impaired people with sighted people, by experiencing art together.

### 2.4.2 Museums in the Netherlands


The process of creating a more inclusive cultural sector is already well underway. There are platforms, like: ‘Studio I’ (Studio I, 2019) that are committed to making our society more inclusive and museums more accessible.

*An inclusive museum is for everyone, a public space to learn, view and explore art.*

- (Studio I, 2019).

Projects such as these are vital, not only to ensure that the art of this collection can be experienced by everyone, but to help break some of the social and cultural myths about disability and the physical ability of a person to feel included.

In The Netherlands a lot of cultural institutions have already launched projects or created programmes that appeal to new target audiences (Studio I, 2019). But, still the majority of museums and artworks are only accessible for the eye. Besides, the solutions provided are often specifically customized, because of the large differences within the target group. So even if they are
present, they are not accessible to all people with visual impairments (Bartiméus, 2019).

2.4.3 Special programs, tours and tools provided by Dutch museums

“Sight isn’t the only pathway to understand art”
- Coates, 2019

What do museums offer for visually impaired visitors to experience art? Several museums have begun using touch, audio, and even smell, to give those without vision the ability to experience art (Hartjes, M., 2017, Museum open U). With innovative tools, smart customization and specific guidance many forms to explore artworks are made possible for visually impaired visitors. Museums like Escher Palace museum, Boijmans van Beuningen and Van Abbe Museum provide special programs, such as interactive tours for blind and ill-sighted visitors. The guides make use of several interpretative resources, such as touch replicas, music, scent, literature, poetry and small reproductions to bring the artworks to life. Below some examples are listed.

Tactile experiences
Touchable artworks
Sometimes it is possible to touch the artwork itself, either with gloves or with bare hands. Mostly sculptures, since they provide more information when touching than 2D artworks. The artist and/or museum

Figure 19: A 2D artwork made for visually impaired people to touch, at Bartiméus office in Zeist.
pick the works that are allowed to touch. Mainly during a guided tour.

Figure 20: V. Bijlo and H. Wallrafen touching a bronze sculpture from Eduardo Chillida (Geluid in zicht, 2018).
Figure 21: Visually impaired person touching the real sculpture with gloves, at Beelden aan Zee.

Note: A special guided tour can be in a group, together with sighted people, one-on-one, or together with a group of visually impaired people. Most tours are guided by a well-trained guide, familiar in the field of people with a visual impairment. Most of the time guided tours provide special tactile and audio tools, such as tactile objects; the verbal explanation that is given, with room for asking questions to the guide; and social interaction with others, discussing the artwork.

Figure 22: One-on-one guided tour. (Ernst, F., n.d.).
Figure 23: Special guided tour for a group of visually impaired people together with a companion (College Of The Arts., 2015).
Figure 24: A guide providing a tactile drawing: handing and explaining it to a visually impaired visitor (Ernst, F., n.d.).

Relief copies
Of some artworks a similar copy is made, with a 3D printer for example, in order to feel the artwork in relief. These can be touched during guided tours or found in a special exhibition or next to the artwork. Some artworks are translated into one single relief drawing, or multiple drawings, providing different information. These drawings can be either presented at special guided tours or found at tactile stations.

**Note:** A tactile station is a place where some sort of tactile representation of the artwork is found with additional information, such as (braille) text, a legend or audio explanation. Tactile stations can be explored without guided tours, but are still very specific and fixed to particular artworks.

*Figure 27:* A visually impaired woman sitting in front of a tactile station (Veld, in ‘t D., 2019).

*Figure 28:* A mother and her two kids standing in front of a tactile station (Raymond, 2018).
Tactile line drawings
A tactile line drawing represents parts of an artwork. It is often a simplified drawing of the artwork. It can provide information about the whole painting or partial information on what can be seen in the artwork.

Figure 29: Tactile representation with a tactile legend to explain textures. When I joined a tour at Escher Palace museum.
Figures 30: A tactile line drawing made by a guide at Beelden aan Zee museum.

Figure 31: A man holding a printed tactile line drawing at Van Abbemuseum (Museumcontact, n.d.).
Figure 32: A woman holding a printed tactile drawing (van Abbemuseum, 2019).
3D replica’s
A 3D replica is a replica of a 2D artwork made with, for example, computer and 3D printer software. These tactile replicas are either used at special exhibitions, special guided tours or at tactile stations.

Figure 33: A 3D replica of the artwork “Drawing hands” by Escher. Figure 34: A 3D representation of the Mona Lisa to touch (Colossal, n.d.).

3D objects
Some guided tours provide 3D objects that are similar to objects in the painting. This can be either existing objects or made specifically for that piece of art.

Figure 35: A woman holding a 3D object at Van Abbe museum. (Buck, de M., n.d.) Figure 36: A foam object from one of Escher’s drawings.
Audio experiences
Regular audiotours
Some visually impaired people, mostly ill-sighted people who still have some sight, sometimes listen to regular audio tours. They either use devices of the museum or their own smartphone (via an app of the museum or other art app, like Artvive or Smartify). Audio recordings could be either in dramatic story-like or told in a theoretical and factual format.

Figure 37: Two people holding a mobile device (provided by the museum) to hear the audio tour (Mestrovis, M., n.d.).
Figure 38: Woman listening to an audio tour via a mobile device of the museum with headphones (Dexingur, n.d.).

Figure 39 and 40: Scanning a QRcode to download the app for an audio tour or listen to an audio piece (Brooks, C., 2019) (Dunne, S., n.d.).
Special audio descriptive tours
Audio description is the principal means of bringing arts to life for visually impaired people. For this a precise and logically structures language is used. The narrative about the artworks, either delivered live with a tour or as an audio recorded guide, is told descriptive, including descriptions about colour, material and shapes. (Recorded audio description can take the form of a full tour with navigation directions between the stops; standalone object descriptions).

Figure 41: Museum visitor touching a sculpture while listening to a special audio description on headphones (Barbante, S., 2017).
Special exhibitions
Examples of special exhibitions made for visually impaired:

**Multisensory exhibition at Van Abbe museum.**
This exhibition used 2 ways to present the artwork: a tactile line drawing, and a 3D model.

![Image of tactile line drawing and 3D model](image)

*Figure 42 and 43: Multi sensory exhibition at van Abbemuseum (Bollmann, B., 2019).*

**“Touching Van Gogh”**
(“Van Gogh op gevoel”) at van Gogh Museum.

![Image of exhibition with tactile image and woman touching artwork](image)

*Figure 44: Exhibition to touch at van Gogh museum (Van Gogh Museum, 2016).*

*Figure 45: A friend of mine touching a Van Gogh copy.*
Note: a multi-sensory exhibition experience is an exhibition where more than one sense is used to explore artworks. Using more than one sense provides a much richer understanding. For more references of Dutch museums with special programs, please refer to Appendix 3.

All of the programs, tools and tours make it possible to explore art in various ways. However, for all of the mentioned above, visually impaired people are still dependent on the selection and choices of the museums (specific audio tours, fixed tactile stations or tactile representations), tour guides, people in the group or the fixed agenda (days that tours and programs are available).

Also, there is not much designed for social interaction between blind and sighted people. Even though visually impaired people wish to be involved and have a similar experience as sighted people (Akasawa, 2018).

Design take-away:
• The design could be a solution to fit into different museum contexts to help visually impaired individuals experience the art.
• The design could be innovative and different from programs that already exist.
• The design could also provide a new experience for sighted museum visitors.
Inaccessible artworks and museum accessibility

A regular independent visit to a museum (so not a special guided tour) is barely adjusted to the needs of people with a visual impairment, the reasons for that differ.

Sometimes museums cannot make adjustments to their collections, like tactile stations standing close to the artworks, because of the space provided or the restrictions (Hartjes, M., 2018).

Another reason can be that the museum cannot make it possible to touch the artwork(s), due to preciousness or fragility of the work or is not able to produce a replica due to costs or copyrights.

Lastly, a museum can have a collection that is (too) big or changes often, which makes it hard to make all the artworks accessible. Therefore, you see that most museums only choose to make a few of their masterpieces accessible. Tactile representations, touch opportunities for a whole collection can be a big effort and investment. Installation costs can be high when there is not one single system or design that can be used for different exhibitions (Krause, N. L., 2004).

There are alternatives to solve some of these issues, like mentioned in the previous section, but museums do not always have the knowledge, time, trained people or the technology to do so.

**Design take-away:**

- The design could provide a tactile experience.
- The design could keep into consideration that not all artworks can be touched.
- The design could not be dependent on museum
restrictions.
- The design could fit or be implemented for different exhibitions, museum spaces and buildings, in order to provide a freedom of choice on what artworks to explore.

See Appendix 4 for all design take-aways from the Literature Research listed together.

2.5 Summary Literature research

Visually impaired people
A sizeable part of the Dutch population (320,000 people) is visually impaired, about 85% of them are 50 years or older. There are many types of vision impairment, including low vision as well as blindness. This varies per situation and per person. 23% of visually impaired people are called blind (they see less than 5%) and only 20% of people categorized as blind are completely blind. Having a visual impairment affects many aspects of daily life, ranging from very practical, technical problems to psychological and social problems. For example, social exclusion and being dependent on others are experienced as key disadvantages.

The role of art
Art is important for everyone in society, including people with disabilities, because of many reasons. Art addresses knowledge about history and humanity. It communicates important messages, incites new questions and provokes curiosity, excitement and outrage. At the same time, art adds to the well-being of people. It can help overcome depression, help people to express themselves, can create meaningful interactions between people and adds beauty and pleasure to the world.
The museum context

The purpose of museums is to enable all visitors to enjoy its collections, to educate the public and make their collections accessible for everyone. Only 8% of the Dutch museums had programs for visually impaired people in 2016. Their guided tours and multisensory experiences provide visually impaired to dive deep into an artwork and get a full understanding (other than sighted people). Those tours provide special tools, such as tactile objects; a verbal explanation given by guides, room to ask questions; and social interaction with others. The provided solutions are often specifically customized, because of the large differences within the target group.

Visually impaired people are dependent on the efforts that museums make, the selected art to experience with multiple senses, and the tours they provide. They are dependent on the museums agenda. In addition to exploring with multi senses, visually impaired people like to visit museums together with others.
3. Field research

This chapter shows the field research process. First, research questions are listed. Then, the methods are briefly explained and finally, in section 2.3, the results of the field research are presented, as answers to the research questions.

3.1 Research questions

This paragraph shows the research questions that came up along the literature study, to further investigate through field research. To get a better understanding of how visually impaired people can explore art, more insights are needed on the experiences and wishes by the target group itself.

In the field research I further investigated how visually impaired people experience and explore art right now, what they would like to get out of their museum visit, and what is needed to achieve this. In paragraph 2.5 a summary is shown from the literature search.

For each part (visually impaired people; exploring art; the museum context) different research questions arose. These questions are more based on a qualitative level for the research, to dive more into the ‘how’. Below and on the next page these questions are phrased, together with one leading question: the main research question.

Main research question:
What do visually impaired people need, want and wish for, to be able to explore visual 2D artworks when going to a museum?
**Visually impaired people**
A. How do visually impaired people experience their daily life (including dependency on others)?

B. How do visually impaired people function in daily life by using their senses?

**Exploration of art**
C. How do visually impaired people want to explore artworks themselves vs. in social context?

D. How can visually impaired people use their senses to experience, understand and explore artworks?

**The museum context**
E. How do visually impaired people experience special programs for them at museums?

F. What do visually impaired people want to get out of their museum visit?

### 3.2 Research Approach

This paragraph shows the methods used to gather, analyse, select and present data. These methods were key to answer the research questions, to form a well-defined problem definition and a design brief (chapter 4) - including a design goal, interaction vision and list of design requirements, - to take to phase 2: “Design”. The methods are briefly explained in this chapter.

**3.2.1 Used methods to gather data**
To get a better understanding of the situation and the target group, to discover their needs and wishes,
qualitative field research was done. This would provide more insight into the museum context. Different qualitative field research methods were executed: self-exploration (Autoethnography, Jones, 2007), observing (Sanders, 2012) and interviewing (Semi-structured interviews, Newton, 2010) (Boeijen et al., 2014). 14 Visually impaired people were observed, 10 visually impaired people and 10 experts from 6 different companies in the field were interviewed. The self-exploring, interviewing and observing helped to create a better understanding of the problems, wishes and needs of the target group.

An overview of the used research methods, to gather data, is shown in a table on the next four pages. The table shows the type of method, the people involved and where it was conducted.

For each of the methods used, a reference number is added in the table, to later refer to that method. To be able to refer to people their quotes, I also added reference numbers for each person that was involved. For example: the first Short Interview, has a reference number: SI1. A Visually Impaired person interviewed has a reference number: VIP1.

These reference numbers serve as a connection between the methods and the results, which I present in paragraph 3.4. In that way, it is easy to refer where the insight or quote came from.

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<td>M = Myself</td>
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<td>SI = Short Interview</td>
<td>DI = Deep Interview</td>
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<td>VIP = Visually Impaired Person</td>
<td>Expert = Expert</td>
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<tr>
<td>1 Sighted experts from Bartimeus</td>
<td>Bartimeus Expert 2</td>
<td></td>
</tr>
</tbody>
</table>
Figure 46: Self-exploration at muZIEum
3.2.1.1 Self-exploration
The project holds a relatively unfamiliar target group for me to empathize with. To get a good understanding of their life, their different way of obtaining information and their ambitions it was necessary to experience it myself. To do this, I used a method called autoethnography by Holman Jones (2007). This type of approach allowed me to step into one’s shoes and experience emotions and struggles. For this, I used principles of autobiography (a self-written narration of the life of oneself) and ethnography (observing and interacting with participants in their real-life environment). Autoethnography allowed me to write in a highly personalized style and then draw on my experience, to extend understanding of the societal events of visually impaired people.

Autoethnography at muZIEum (A1)
Autoethnography was done through empathy exercises at muZIEum, an experience museum, where you can experience what it is like to be visually impaired. This experience allowed me to gain a partial insight into how visually impaired people perceive their environment.

I participated in two tours: ‘the ripple route’, where I walked through the city centre of Nijmegen together with a guide, wearing VR glasses. I experienced 5 different eye disorders through augmented reality (AR) and I got to use a cane and to navigate. The second tour was called: the ‘dark experience’, where I walked through a number of dark environments/rooms to experience the daily life of someone who is blind. In these rooms, real-life situations were simulated, like a street, a cafe and a supermarket. The programs lasted more than an hour and I was accompanied by a group of 3 other participants and 1 visually impaired muZIEum employee.
Even though this was a useful exercise, the short time I spent in the dark and wore VR glasses cannot mimic the experience of living with a visual impairment every day. However, this experience helped me to gain empathy and provided me with an emotional response that I could use while conducting interviews and during the design process.

3.2.1.2 Observing
For the observations, a semi-structured observation method by Tomitsch (2018), was used. This was chosen because it allows the observer to cover topics that occur at that moment. An observation sheet was used. Events were written down, according to the questions on the sheet: What? (user goal/task), Where? (location), Physical behaviour? (facial expressions, gaze, emotional state), Quote? (or striking note). An example for this is:

What? Touching a relief drawing;
Where? While standing in front of the painting “writing hands” by Escher;
Physical behaviour? Participant smiles, looks impressed, like having an aha-moment.
Quote? “Oh now I understand. I can feel two hands coming out of the paper!”. 

Observing visitors at Dutch Design Week and Van Abbemuseum (O1)
At Dutch Design Week I, participated in various exhibitions about the use of our senses or multisensory experience design. I viewed exhibitions that had something to do with visual impaired people or art. See Appendix 5 for the different exhibitions I visited during Dutch Design Week. These exhibitions inspired me on multi-sensory design or gave me new insights on how to design for visually impaired people.
Figure 47: Observations at Dutch Design Week of interactive multisensory exhibitions.

Observing visually impaired participants at a Usertest of Dedicon for a new application (O2)
I joined a test-day organized by Dedicon, on how visually impaired people interact with a tactile city map and a navigation app on their smartphones.

The test was about finding your way through The Hague city centre. During the tests I remained in the background, walking along with the groups. I noted my insights; questions that came up, and made special remarks or wrote down interesting quotes in my notebook. I joined the test to find out how visually impaired people navigate with tools; interact with a tactile drawing; interact with a smartphone and special application; and, interact with sighted people. I focused on the behaviour of the participants, their struggles and emotions. In some cases, I asked a question or started a conversation with someone.

Appendix 6 shows the observation sheet.
Observing visually impaired museum visitors during a special guided tour at the museum (O3 (a and b))
I observed special guided tours at Beelden aan Zee museum and Escher Palace museum. These tours allowed
me to experience and see a special tour for myself. I joined the tours to get to know what visually impaired people need, want and wish for when exploring visual 2D artworks; and how they interact with other participants, their companion and the tour guide. The focus was on these interactions. I walked along with the groups and wrote my insights on an observation sheet, I made special remarks, like quotes that were striking or represented a specific situation or issue. In some cases, I started small conversations, only when not interrupting their museum visit. After the tours I talked with the guides to reflect on the tour.

3.2.1.3 Interviewing
Interviewing helped me to dive into the world of visually impaired people, museums, exhibitions, art installations and ongoing projects.

Interview setup and structure
The interview questions set up was done according to the research questions, using a semi-structured interview set-up by Newton (2010). To gather information, on how to formulate questions and form an interview, I used a method book by Tomitch (2018, p.78) and The Delft Design Guide (Boeijen et al., 2014, p.47).

Type of interviews
I conducted short and deep interviews. The short interviews, with both visually impaired people and experts, were mainly done to gather information to kick off the project, to get to know more people in the field and to start my search about visually impaired people in the museum context.
The long interviews with visually impaired people were done to really dive into all the research questions and get to know what visually impaired people need, want and wish
for to be able to explore visual 2D artworks when going to a museum.
The long interviews with experts were done to cover most research questions, ask questions about existing projects and listen to their ideas.

In total 10 visually impaired (3 born blind, 2 legally blind and 5 ill-sighted participants) and 10 experts from 8 different companies (Bartiméus, Dedicon, Oogvereniging, Visio, Voorall, Kubes, Escher Museum and Beelden aan Zee museum) in the field, were interviewed.

**The short interviews (SI1 & SI2) & (SI3 & SI4)**
The short interviews with visually impaired people and with experts from Visio and Voorall helped me to get started. They introduced me with more people of the target audience, ongoing related projects and relevant companies or organizations. The short interviews lasted between 10 to 30 minutes, either through the phone or face to face.

I asked the visually impaired people questions about their daily lives, how they move around, what good experiences or problems they faced when going to a museum and if they could recommend any relevant organizations, companies or programs I should look into. Two interviewees had worked or still work with museums, one at Rijksmuseum and the other with Van Gogh museum. Refer to Appendix 7 for the interview questions of the short interviews.

**The deep interviews (DI1, DI4a, DI4b, DI4c) & (DI2, DI3, DI5, DI6, DI7)**
The deep interviews with 5 visually impaired people (2 people, both born-blind, face-to-face; and 3 people of which 2 ill-sighted, and 1 born-blind, on the phone) helped me to understand what visually impaired people need,
want and wish for when exploring visual 2D artworks and going to a museum. The deep interviews took about 60 to 90 minutes each. The questions I asked can be found in Appendix 8.

The deep interviews with experts were also done through phone or face-to-face. I had deep interviews (30-90 min.) with experts from museum Beelden aan Zee, a museum that has special guided tours for visually impaired people; Dedicon, an organization that does research for visually impaired people and provide tools to read; KUBES, a foundation for and together with visually impaired people, to make art and culture accessible; The eye association company, for services for visually impaired people; and Bartiméus foundation for projects for and with visually impaired people. Appendix 9 shows the questions used for these interviews.

3.2.2 Used methods to analyse, select and present data

The insights that I gathered through self-exploration, interviews, observational research, were first documented in the self-made: ‘insight cards’ (see Appendix 10). An example of such an insight card is shown in Figure 51, 52 and 53. The insight cards consist of a written insight, visualization of that insight and the source of origin (what interview, observation or other exploration).

Figure 51: An insight card.
After collecting all data, the insight cards were laid down on my table at home (see figure 54), to cluster them according to similar themes. This was done to identify, analyse, organize and report themes found within the data set (Braun & Clarke, 2006).
Then, the themes were linked to the research questions. The insight cards were then digitized into a diagram. The most important insights, originated from this diagram, are presented in the next chapter, presented per research question.

Each insight has been reviewed, filtered and assessed. The selection was based on how: often they occurred (common, repeatedly found); surprising (new to me, as well as experts and/or visually impaired people); striking (specifically emphasized by multiple papers, interviewees and/or people I observed); and inspiring (triggering and inspiring to me to start problem-solving and designing) they were. They were also filtered on doubles, obviousness and scale. Double insights; insights out of scope; and too obvious insights were eliminated.

3.2.3 Used Methods to get to conclusions

As a conclusion of the field research, a problem definition, according to the method from Delft design guide was created (Boeijen et al., 2014).

Furthermore, personas were made to conclude insights about the target group. These personas provide an overview of insights from observing and interviewing the target audience, to further help with the design process (Tomitsch et al., 2018).

In addition, a design goal and interaction vision have constantly been developed, according to the method of the course: Exploring Interactions (2018) from the IDE master program.

The insights, problem definition and design goal were all used to compile the design requirements, for the design phase (starting on p.148), according to the method from Delft design guide by Boeijen et al (2014).
3.3 Results: Insight clusters

The insights gathered from the field research (self-exploration, interviews, observational research) revealed information about the target group, their behaviour in daily life and their experiences with museums and art. This chapter shows these results, organized according to the research questions. The self-exploration, observations and interviews are referred to with the coding system. The most striking, most common and most inspiring insights were selected and are presented below.

For each insight is mentioned from which source (self-exploration, interview or observation) it originated, according to the coding system from the table on pages 90 to 93.

3.3.1 Visually impaired people in general

Research Question A: How do visually impaired people experience their daily life?

Different impairments mean different experiences
The group of visually impaired people varies widely. Therefore every individual experiences things in daily life differently. Utensils, tools or devices that are required to function, are also used in different ways (O2, O3, SI1, SI2, DI1, DI4, Q1, SI3, SI4, DI2, DI3, DI5, DI6, DI7).

“I want to be able to set up a digital system or electronic device according to my user preferences”, (VIP20, DI1).

“It is important that a tool can be used by different people with different impairments. Not one design fits all, we are all different”, (VIP20, DI1).
Design take-away:
• The design could provide a variety of options to explore or be adaptable to different users with different impairments.

Equal part in society
Visually impaired people want to take part in all facets of life and be able to do activities with sighted people as well. They do not want to be separated from others. They want to experience and enjoy the things and activities around them on an equal level as sighted people: equal chances in what society provides to the public.

At the same time, visually impaired people experience a social distance from doing activities together with sighted people. They experience that most people treat them differently because of their disability, which they don’t like. They want to feel ‘normal’ like everyone else (SI1, SI2, DI1).

Design take-away:
• The design could bring visually impaired museum visitors together with a sighted museum visitors in an art experience.

Independency
Visually impaired people are all different, as is their dependence on others. The level of independence correlates with the degree of impairment, and since when the individual has had the impairment (SI1, SI2, DI1). Visually impaired people want to feel independent and only want to get help if they ask for it. They do not like unsolicited help and feel it is unwanted to be helped out of pity for their handicap (SI2, DI1).

“Ask me IF you may help me, ask me HOW you can
help me. Not just assume that I need help”, (VIP18, SI1).

However, walking around is easier with a sighted companion, because of most environments and designs of public spaces. With a sighted person it can be more relaxed to navigate and move around (O2).

“When I walk through the city together with my husband, I do not have to think, I just take his hand. This is relaxing for me.” (VIP3, O2).

**Design take-away:**
- The design could be able to use in different degrees of independence. Being able to do it partially alone or with help, when wanted.
- The design could make visually impaired people feel independent.

**Tools**
Visually impaired people find completely new experiences or dealing with unrecognizable objects or devices tiring, because they need to adapt more to it than others. Having to execute multiple tasks at once (multitasking) or carrying multiple objects around, takes a lot of effort for visually impaired people (A1, SI1, SI2, DI1).

“When walking a new street, with a different colour pavement, it costs a lot of energy to adapt. Some streets have the same recognizable paving, which makes it easier.” (VIP19, SI1).

“At the end of a museum visit or day out with my family I am so tired. Most of the time I fall asleep on the couch after spending a day together with my kids and husband”, (VIP17, SI1).
“With my bag to carry and my dog to hold, my hands are already full.” (VIP1, O2).

**Design take-away:**
- The design could have similar features of other user-products for visually impaired people. This could help to make parts of the design recognizable and therefore easier to understand or to interact with.
- The design could be easy to carry around, have as little amount of objects (parts) as possible.
- The design could contain easy to follow steps and as few steps as possible execute a task, in order to follow easily and be less tiring.

**Research Question B: How do visually impaired people function in daily life by using their senses?**

**Vision**

Each person, with a little vision left, uses their sight in a different way. Most of them want to use their remaining vision to explore (O2, SI1, SI2, DI1, DI6). The type of visual impairment influences the way a person perceives contrast, colour, depth, distance etc. Also, light sensitivity is different for different types of visual impairments. Most ill-sighted people can see a little contrast (SI2, DI1, O3, DI6).

Vision, visual knowledge and visual memory differ between visual impaired people. Therefore, explaining 2D images, shading/shadow, perspective or colour to a blind person is hard, especially when they were born blind. Someone who was born blind, just got blind or still has little vision all perceive colours differently (O3, DI6).

“I never saw any colour, so it does not mean anything to me.” (VIP 22, DI1).
“The screen preferences of an app should be adaptable to my impairment. The intensity of the screen, the contrast and the size for example. In that way I can use my remaining vision.” (VIP20, DI1).

“Because I have no iris, to me a white, bright room is very overwhelming. Then I end up wearing glasses inside the whole day.” (VIP20, DI1).

**Design take-away:**

- The design could provide the opportunity for ill-sighted people to use remaining sight. The design could meet guidelines for colour, contrast, font sizes (could make it readable).
- The design could take light sensitivity, contrast and colours in consideration for different types of visual impairment.
- The design could consider the differences in knowledge and visual memory between people born blind, late blind, legally blind and ill-sighted.

**Touch**

Hands are useful for visually impaired people to function. Hands are indispensable, vital tools when exploring, since they can be used in multiple ways and provide tactile information (A1, O1, O3, Q1, DI6).

“I want to touch something in order to ‘see’ it. I see with my hands.” (VIP17, SI1).

A tactile reproduction, such as tactile drawings, always require additional information in order to understand it completely. Think of an index, a legend or verbal explanation (O1, O2, DI1, DI4, DI6). When providing information as an alternative to text, it is unfair to provide
braille only. Not all visually impaired people can read braille (O2, DI5).

“I am ill-sighted, but I cannot read braille. It is a misconception that all visually impaired people learn how to read braille.” (VIP20, DI1).

**Design take-away:**

- The design could include some sort of tactile representation or touch experience of the artwork, in order to gather information through touch.
- The design could consider the level of tactile skill of people.
- The design could provide multiple options to give information, in addition to braille (for example: audio description, voice-over, big text font).
- The design could give additional explanation when providing tactile information.

**Audio**

Verbal explanation helps visually impaired people to gather information quickly. For example, listening to environmental sounds, reaction/echo sounds, voice-over functions on smartphones and conversations with people around them.

However, too much environmental sound is perceived as distracting and overwhelming (A1, O1, O2, SI1, DI1).

“When I go to Albert Heijn, there are a lot of different sounds, such as background music, beeping sounds and people talking. They make it hard for me to focus. (VIP17, SI1).

**Design take-away:**

- The design could provide verbal explanation to provide
information about the artwork.

3.3.2 Exploration of art

Research Question C: How do visually impaired people want to explore artworks, alone and with others?

Exploring art together with sighted people
Exploring art with other visually impaired or with sighted people are both experienced more meaningful than exploring alone (O3, SI1, DI1, DI4, Q1, DI5, DI6).

Interaction between visually impaired and sighted museum visitors can lead to another view and a deeper understanding of the artwork. Discussion, speculation and conversation helps people to change perspective and make them think critically, resulting in an enriched experience of the work (O3, SI1, DI1, DI4, Q1, DI5, DI6).

“I understand the painting better sometimes after talking about it together.” (VIP23, DI1).

“I want to be able to experience or explore the art myself and on the same level as my sighted girlfriend. I want to explore it together.” (VIP12, SI1).

Both sighted and visually impaired people experience artworks in new ways by exploring art together. They can teach each other new things, by exchanging perspectives. Namely, both experience artworks differently, because of their different observational skills (depending on the experience, either audio or tactile), different visual perception and difference in visual memory. Triggering conversation, discussion and interpretations help them to explore the artworks thoroughly together and give more meaning to the experience. Looking at artworks together with a visually impaired person, as a sighted person, can
change perspective of looking at the artwork for a sighted person as well. Eg. by asking what the visually impaired (ill-sighted or legally blind) person (still) sees or what stands out by touch. Thus, exploring artworks as a sighted person, together with a visually impaired person, can deepen the artwork experience and change the way of looking at art, visually impaired people like that. (O3, SI1, DI1, DI4, Q1, DI5, DI6).

“She discovered through touch that the same type of button of the jacket was also attached on the trouser of the sculptured man. I didn’t even see there was a button there. But then I looked and saw the little detail.” (Beelden aan Zee expert 2).

“If she holds my hand and guides me to feel a certain aspect of the statue, I learn.” (VIP7, O3).

New insights also arise when exploring an artwork together with a person from a different background, age, impairment or handicap. This is because conversations and interpretation related to memory and experience in life differ. Some visually impaired people like the social interaction with strangers at the museum and meet other visually impaired people (O3, DI1, DI4, DI6).

**Design take-away:**
- The design could make it possible for visually impaired people to explore artworks together with their sighted companions to experience their visit as more fun and get more out of their visit.
- The design could start a form of social interaction, discussion or conversation about the artwork between users.
- The design could make users exchange their perspectives, think critically and enlighten views of the
other in order to inform and broaden each others views.
• The design could provide an informative and interesting exploration for both blind, legally blind, ill-sighted and sighted users.
• The design could also be able to use between people with a different background, impairment or interest, and complete strangers could feel comfortable using the design together.

An equal, independent museum visit
Although most visually impaired people like to experience a museum visit with sighted people, they do not know how to create an equally interesting balanced experience for them and their companion. The sighted companion is mostly dominant during visits, because most of the time, the visually impaired companion experiences the art through the eyes of their companion (DI1, DI4, DI5, DI6).

Interpretations of others about the artwork can broaden own perspective, but most like to hear these interpretations of others about the artworks after they formed their own. Only having interpretations of others about the artwork without other information is found frustrating, because visually impaired museum visitors want to be independent in exploring themselves. In this context, independent also means apart from a guided tour or special program. Visually impaired people dislike it when they depend on others. They want to have room for their own imagination and interpretations, when exploring an artwork (#85, 94, 97: DI1, DI4, DI5, DI6).

“I want access to what you see, I don’t care about your interpretation. I want a good tactile representation or description of the artwork.” (VIP23, DI4).

Design take-away:
The design could provide an equal experience to both sighted and visually impaired people.
The design could leave room for own imagination and interpretation about the artwork for visually impaired users.

Research Question D: How can visually impaired people use their senses to experience, understand and explore artworks?

Multisensory experiences
Exploring an artwork when using multiple senses side by side or at the same time, is more informative, rich and immersive than using just one of the senses. For example: a verbal explanation while touching a tactile representation of the artwork enhances one another (A1, O1, O3, SI1, SI2, DI1, DI4, Q1, DI5, DI6, DI7).

“Using multiple senses for a rich experience is recommended.” (Bartiméus Expert 2).

Design take-away:
The design could trigger multiple senses or provide opportunities to trigger different senses, in order to provide a rich experience and exploration of the artwork.

Audio
Audio alone can hardly be enough to create an immersive experience and make people fully understand and experience an artwork. It also depends what type of artwork the story is told about, meaning abstract paintings can be harder to understand (DI1, DI4, DI6). Most visually impaired museum visitors find listening to an audio tour with headphones isolating from their surroundings and in most cases create an unwanted alone-experience (DI1,
“Only an audio file about a painting is most of the time not enough for me.” (VIP23, DI4).

“I do not like to go on an individual audio tour. I cannot see much, so when I put on headphones and cannot hear environmental sounds either, I feel isolated.” (VIP20, DI1).

Verbal explanations are preferred to be told serial and at a desired pace in order to follow. (O2). It is clear when an image is described in a chronological and logical way: clockwise, from general to detail, from left to right or from foreground to background (O3, DI6). Using words as ‘here’ and ‘there’ are unclear for people with a visual impairment, when providing verbal explanations. Clear instructions and direct words as ‘right’ and ‘left’ must be used as a guiding language (O3, DI6).

“I want to be able to pause the audio fragment, it can sometimes go to fast.” (VIP1, O2).

“Be careful with what you say first, it is important not to confuse the listeners.” (Beelden aan Zee expert 1 and Expert 2, DI6).

“From left to right, from top to bottom, from outside to inside. If it is in any way logical to follow. It is easier to follow.” (Beelden aan Zee expert 2, DI6).

Tour Guide: “There you can see the sculpture I was talking about earlier.” - Participant of the guided tour: “There? I am blind. What do you mean left or right? Haha.” (VIP7, O3).
Sound effects can be informative, enrich and add another level of experience to an audio file. However, just listening to sound effects or music can be too much of a personal interpretation or steer imagination, which is unwanted (A1, O1, O2, SI1, DI1, DI4).

**Design take-away:**
- The design could distinguish between type of artworks, like abstract and figurative.
- The design could provide a form of audio or verbal explanation without having to use headphones or be socially isolated of their companions.
- The design could communicate information and stories serial and in a pace as desired by the individual.
- The design could communicate image descriptions chronological and logical.
- The design could communicate in a clear language with direct instructions like ‘right’ and ‘left’ instead of ‘here’ and ‘there’.
- The design could use the right techniques to describe an artwork.

**Touch**
According to most visually impaired museum visitors, touching enriches and supports the artwork experience and is essential to understand the artwork. A simple tactile line drawing can already provide a lot of information (more than without). Also, using multiple different tactile presentation forms to explain a 2D image can be very helpful. A deeper understanding of the information in the painting can be reached this way. A 3D model or scale model, for example, can provide different layers of information than just words or a tactile drawing alone can achieve, think of explaining the perspective in a painting (O1, O3, DI1, DI4, Q1, DI5, DI6).
“I want to listen and touch. Only that way I experience an artwork to the fullest. In a rich way.” (VIP24, DI4).

Despite the desire for touch, it is unwanted to feel too much or unnecessary details within a tactile drawing. Tracing lines on a tactile paper is hard when the drawing has much detail. If it can be simple, it must be simple. Bigger simple tactile drawings are easier to understand than complex, detailed small tactile drawings (O2, O3, DI5, DI6).

“The differences between dots and lines are hard to discover, is there a difference or can they be the same?” (VIP1, O2).

The information on a tactile drawing must be organized serial. If the information is randomly organized with no logic, it confuses visually impaired ‘readers’. Think of a vertical title, an unclear legend, the placing and orientation of braille on the paper (O2, DI5). Feeling day to day/well-known objects can be too obvious, often unwanted or experienced as childish, unless they have a specific shape, different than usual (DI4, DI6).

“The information of the map should not be going back and forth. I want the legend of the map to be after the title or introduction written in braille, not randomly on another or the backside of the page.” (VIP1, O2).

“A city map needs a good, well explanatory legend in order for me to read and understand it.” (VIP2, DI4).

“It is unnecessary to give me an object I use every day or an object that is well-known. I am not a child, I know what well-known objects feel like.” (VIP24, DI4).
Touching with two hands, instead of one hand, helps understand navigate and explore the object, tactile drawing or relief drawing better (O2, O3, D15, D16).

A tactile experience always needs verbal explanation, additional information or audio explanation in order to be understood properly. A verbal explanation together with a touching experience (touching an object, relief drawing, artwork or replica) increases the chance of deep understanding and enriches the experience. Especially when it is an oddly shaped or ambiguous object (#O3, D11, D14, Q1, D16).

“Listening to information while touching is pleasant, it helps me to understand better.” (VIP7, O3).

Touch experiences are also influenced by when the explanation is given: before, during or after touching. Explanation while doing is positively experienced (O3, D16).

**Design take-away:**
- The design could look for different ways to communicate and explain different layers of information.
- The design could be simple, avoiding use of unnecessary detail when providing a tactile experience.
- The tactile part of the design could be organized serial and logical. Think of a vertical title, an unclear legend, the placing and orientation of braille on the paper.
- The design could not make users execute and explore the obvious or approach them in a childish way, because of their impairment.
- The design could provide tactile surfaces in such a way that there is room and opportunity to touch it with two hands.
- The design could provide a verbal explanation
while touching. Explanation while doing is positively experienced.
• The design could consider when to provide verbal explanation, before, after or during touching.

Other senses
Most visually impaired museum visitors choose touch and audio over smell and taste when using senses in a multisensory experience with art. They think smell can be left out of a museum and art experience, because of their experiences with it (too personal, obvious or childish (DI1, DI4).

“Be careful with smell. It can become really childish.” (VIP23, DI4).

Feeling a posture of someone else’s body mimicking a painting, as well as mirroring, is informative, adds to a story and helps to understand a 2D painting quickly. Mimicking a painting starts a conversation and can add to social interaction (DI6).

Design take-away:
• The design could provide a feeling exercise of mimicking the artwork in order to sense and understand the artwork better.
• The design could not contain a smell or tasting experience, since it is mostly too personal, can be childish or obvious.
3.3.3 The museum context

Research Question E: How do visually impaired people experience the special programs for them at museums?

Guided tours
Guided tours are seen as both positive and negative. Visually impaired people join special guided tours because they like the guidance to explore the artworks in a richer way and to get a deeper understanding of the artworks. The guide gives instructions on how to interact with others and learn new things about the artworks together (O3, D16).

“I love joining all kinds of museum tours! they learn me new things.” (VIP25)

“Some guides are prepared very well, they teach me things or open conversation about new things.” (VIP9, O3).

“I like the fact that they make me touch replicas or even the real sculptures, like today. I also like the extra explanation while I experience touching.” (VIP7, O3).

At the same time, a guided tour can be stressful to keep up with or be annoying because it might take too slow. Visually impaired people vary and have different needs in speed, explanation, guidance. A lot of tours are influenced by the people joining and these different needs. Therefore group composition can have a negative influence on the experience (O3).

“I was feeling the stress of the guide to keep the group together. That’s not my job to be worried about.” (VIP7, O3).
“It is annoying to constantly having to think of the group and being dependent on the people in the group.” (VIP9, O3).

“Sometimes it takes too long, because the group of people move slow.” (VIP20, DI1).

Most visually impaired people do not like to always be dependent of special dates or fixed schedules. They want to be independent from when to go. They do not like to be dependent on the schedule of a museum (SI1, DI1, O3).

“I want to go to the museum whenever I want.” (VIP20, DI1).

**Design take-away:**
- The design could provide help and guidance to help users understand the artwork better.
- The design could provide guidelines and guidance on how to explore and learn new things together.
- The design could not be dependent on a group of people.
- The design could not be influenced by time or have a time limit or needed speed in order to use it.
- The design could provide guidance in different styles or provide a choice between different ways of guidance/assisting to explore the artwork.
- The design could not be dependent of any tour guide or museum employee.

**Special installations**
Sometimes special tools, installations or tactile stations (a station to feel information about an artwork,) are not placed well-considered (in front of a chair or artwork), but rather inconvenient. They should be placed considerable
and carefully (O2, SI1, SI2, DI1).

Fixed customized tactile stations and installations (a selected tactile experience in front of a chosen artwork) limits a museum visit, because visually impaired visitors are only able to explore a few selected artworks (O3, DI1, DI5, DI6).

**Design take-away:**
- The design could be placed considerable and carefully in order to use properly by visually impaired museum visitors.
- The design could not limit in choice of what artwork the users can explore.
- The design could be more mobile to move around with and be able to use for different works of art, instead of a fixed and specifically modified station or installation.

**Tools provided**
Most audio devices provided by museums are not accessible or user friendly for visually impaired visitors. They prefer their own smart devices when exploring through a museum, over the ones provided by museums. They are used to their own devices and settings. Also, having to use another digital device than their own takes more time and energy to adapt to. (O2, DI1, DI5).

“I rather use my own phone with an app or something like that, rather than a device of the museum, because I have to get use to it and that takes a lot of time.” (VIP20, DI1).

“Using headphones that museums offer (the kind where you are forced to put on both ears), isolates me from the environment. Then, I feel more isolated than a sighted person. Walking around is even harder without
eyes and ears.” (VIP20, DI1).

Design take-away:
• Users could be able to use their own device/phone/.headphones when in need of using an app or listening to audio.

Research Question F: What do visually impaired people want to get out of their museum visit?

A social experience
Most visually impaired people go to a museum with a sighted friend, family member or their partner (companions). Mainly because they like to explore art together. Visually impaired people want to be able to have fun with other people. Going to a museum is mostly seen as a social event. They want a playful interaction with their friends or family when going to a museum (DI1, DI4, Q1).

“I go together with my family, after all, going to the museum starts with being out, doing something social” (VIP24, DI1).

“When I go to a museum, I always go together with my sighted mother.” (VIP25).

Social interaction between blind and sighted people is rare in museums, but desirable. For both visually impaired and sighted people.

Design take-away:
• The design could provide a playful and fun museum visit for sighted and visually impaired people: a joint social experience.
Learning new things
Visually impaired people go to museums to learn new things about the artworks and artists. They always want some sort of background information or story, even if it is short (DI1, DI5, DI6).

Design take-away:
• The design could teach users something new about the artwork.
• The design could provide some background information of the artwork.

Have a freedom of choice
Visually impaired people want to be able to experience all kinds of artworks; photographs, paintings, sculptures, 2D art, 3D art, etc. and also at different kind of museums (SI1, SI2, DI1, DI4, Q1). They want to be able to choose what artworks to explore, independent in their choices. They also like to have a choice in either getting little or much explanation about a painting. Some visually impaired people like to explore one or two artworks for a longer time to create a deeper understanding, rather than exploring multiple artworks in a short amount of time (DI1, DI4, DI5).

Visually impaired people like to walk around free and independent during their museum visit. Being independent and free in choosing what artworks to explore is important to feel equal like other visitors (#149: DI1, DI4, DI5). Unfortunately, the majority of people with a visual impairment are unable to visit a museum and get an understanding of the collection of artworks without help of an employee or special program (SI1, SI2, DI1, DI4, Q1, DI5, DI6, DI7). It is unwanted to have only one option to explore art.
“I like that museums provide options, like special museum tours for visually impaired people to go to, but to me it feels like that is my only option to explore a specific artwork sometimes. Either go to a special tour or having to wait for a special exhibition. I just want to be able to have a choice.” (VIP21, DI1).

**Design take-away:**
- The design could make it possible to explore different kind of artworks at different type of museums.
- The design could provide a choice of freedom and independence on how to explore and what artworks to explore.
- The design could be available at all times, independent of a schedule, agenda or tour guide/employee of the museum.

See Appendix 11 for all design take-aways from the Field Research listed together.
4. Design Brief

This chapter brings all relevant insights from literature and field research together. The design brief serves as a conclusion from the research, and includes a well-formulated problem definition; a design goal, a more specified design challenge; and an ‘interaction vision’.

Furthermore, this chapter shows a desired situation and the first version (V1.0) of the list of design requirements, which serves as input for the design phase.

4.1 Personas

To communicate the core insights about the target group, personas were created (Tomitsch et al., 2018).

The personas are fictional characters used to represent the target group. They briefly communicate the goals, motivations, attitudes and behaviours of visually impaired people in the museum context. These personas answer multiple research questions: how they would like to explore artworks and what, with whom or how they want to experience a museum visit. The personas are based on the people interviewed and observed. Each persona represents a different part of the target audience.

Six personas are created, of which 2 are blind, 1 legally blind and 3 ill-sighted. Also, each have a different background, motivation to go to the museum.
Elian Zaw - The Creative Entrepreneur

Age: 42  
Occupation: Interior Architect  
Family: Divorced, two daughters  
Archetype: Creative Entrepreneur  
Visual impairment: Ill- sighted

Bio
Elian is an interior architect in Rotterdam. He got divorced a while back and has two daughters, aged 7 and 10. He had a bicycle accident 4 years ago. Since then he is visually impaired. Elian is on a quest to deal with his misfortune, but does not want to see his impairment as a limitation. Elian is a true entrepreneur and he wants to continue to do so. Design, imaging and art is his main interest and an important source of inspiration for his work. Elian still works a lot, but in a different way. He wants to continue to see opportunities and to be up to date with the latest trends. He sees his daughters every other week and likes to go out with his new girlfriend on weekends.

Goals and Interest
- Elian wants to visit art exhibitions to get inspired for his work.  
- Elian wants to be in charge of his museum visit. The amount of time he takes and what to discover.  
- He wants to visit museums together with his girlfriend and both have an equal interesting visit.

Pain points - Concerns
- Elian does not like to be treated special because of his disability. For this, he does not join special guided tours.  
- Elian does not know how to ask for help to his girlfriend. But he does want to explore together with her.  
- Elian is concerned about museums not being accessible at all times. He wants to choose when to go.

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Bob van Wijk - The Retired Teacher

Age: 65
Occupation: Retired Teacher
Family: Wife and two sons
Archetype: The Retired Teacher
Visual impairment: Ill-sighted

Bio
Bob lives with his wife, next to his sister, in Rijswijk. Bob has had macular degeneration in both eyes since he was 35. Bob has been a history teacher at a secondary school in The Hague. He is now retired, misses his work, colleagues and students, but enjoys his free time with full equipment. He likes to discover new adventures and hobbies with his sister and friends. Bob loves games, especially when his nephews and nieces come by. Bob would like to learn more about art. He also wants to discover more within the latest technologies. For example, he recently downloaded the app: ‘Be my eyes’ and opens it regularly to ask if someone is helping him manage his computer. Bob is also active on social media.

Goals and Interest
- Bob loves to be social, therefore he likes to go on museum tours.
- Bob wants to learn new things and get information, but in a playful way. He likes an educative, adventurous and playful experience during a museum visit.
- He wants to go to a museum together with friends or family.

Pain points - Concerns
- Bob does not like when a guided museum tour is too serious. He does want to learn things, but in a playful way.
- He does not want to go to a museum alone.
Emma Bode - The Caregiver

Bio
Emma is married and has a three-year-old son. She has a congenital aniridia disorder and is hypersensitive to light. Emma has a guide dog and a retired dog. After her college education, she had trouble finding a job. She is now a full-time mother. She loves to go out with her husband and son. She practices goal ball once a week, a ball sport for visually impaired people. Together with her husband and some help from her mother, she takes care of her visually impaired child, who has the same condition as her and her father. Emma likes to teach her son as much new things as possible, including art. She learned to use all senses well at a young age, but she keeps learning new things everyday.

Goals and Interest
• Emma is interested in multi-sensory experiences.
• Emma wants to explore art in a playful way together with her son and husband.
• Emma likes to plan her visit upfront.

Pain points - Concerns
• Emma thinks that special guided tours are too directing and take too long.
• Emma is concerned about the excitement and enthusiasm of her son during a museum visit.
• Emma thinks that audio only does not provide a rich enough experience of the artwork.
Bilda Jelma - The Art Lover

Age: 55
Occupation: Museum Volunteer
Family: Husband
Archetype: The Art Lover
Visual impairment: Born blind

Bio
Hilda is born blind. She can see the difference between light and dark. Hilda has a guide dog and lives with her husband. She works as a volunteer at a museum, two days a week, and is a committee member of the KUBES foundation. KUBES is committed to the accessibility of art and culture for visually impaired people, to actively participate in the cultural life. Hilda likes to volunteer as a participant in user-tests for new technologies, to learn things and meet people. On Fridays or Saturdays she likes to go for a walk with her husband and to go to museums with fellow committee members and other visually impaired women, from KUBES.

Goals and Interest
- Hilda loves sound art combined with touch, it can make her emotional.
- Hilda knows a lot about art, but she also likes to hear her husband opinion. Hilda loves to dive into a discussion.
- She wants to be able to explore and interpret the artwork herself first and then hear interpretations of others.

Pain points - Concerns
- She knows a lot about art. She is concerned about the richness of information provided by the museum.
- Hilda is worried that a special guided tour has a childish approach.
- Hilda wants to share her knowledge with her husband, but she does not know how.
Fin Stichter - The Extraversion One

Age: 20
Occupation: Gardening
Family: Single
Archetype: The Extraversion One
Visual impairment: Born blind

Bio
Fin lives internally with Bartiméus. Assisted living offers Fin a customized living space and guidance. Fin was born blind. He has been living internally since he was 14. His days are structured. His daily activities include gardening and participating in various fun activities that the campus offers. He prefers social activities with the other residents. Fin has the classic form of autism. He likes to be social and explore, but is hypersensitive to external stimuli, so that has to be with guidance. He loves Dutch music in particular and he plays the piano himself. Fin is very happy when his father visits on Fridays or takes him on a trip outside the campus.

Goals and Interest
• Going to a museum together with his father on Fridays.
• He wants to explore art with his other senses.
• Fin wants to do a social activity whenever he goes out of the campus.
• He wants structure and guidance during a museum visit.

Pain points - Concerns
• Not all museums have guided tours on Fridays.
• Guided tours are sometimes too overstimulated. Fin wants to be able to move around freely and alone with his father.
• Fin cannot go out alone, he needs someone to go with him.
Sophia Hendriks - The Social Student

Age: 26
Occupation: Student Social Work
Family: Single
Archetype: The Social Student
Visual impairment: Legally blind

Bio
Sophia studies social work. She learns to be independent, work in a team and use her knowledge to motivate others, so they can participate in society. Sophia has 0.5% vision since birth. She lives with her parents in Rotterdam, to be able to rest at home, after her busy days. Sophia takes part in many activities, preferably with her study friends. They love to go to the movies together, where Sophia uses the ‘Earcatch’ app. They also go to museums, both the regular and special tours. In her spare time she likes to listen to audio books about art history or love. Recently, she started painting herself, in her room at home, because it makes her feel relaxed.

Goals and Interest
• Sophia wants to explore as many artworks as possible and visit all kinds of museums.
• She loves to share a museum experience with her study friends and likes to discuss the art with them too.
• All kinds of museum visits can inspire Sophia, but especially when touch and audio are combined.

Pain points - Concerns
• Sometimes museums are not accessible at all. Sophia is then concerned about relying on her friends without being able to give something back.
• Sophia would like to visit museums with a group of friends, but it can be hard for her to keep up with the group and follow their pace.
4.2 Problem definition
This paragraph presents the problem definition, as conclusion of all insights from literature and field research. Each number represents a problem, which are further explained throughout this paragraph.

Joining a Special Tour
Visually impaired people join special programs, such as guided group tours. The special tools provided, guidance and social interaction are positive aspects. The problem is the lack of independance.

Lack of independance

Dependent on Agenda

Dependent on Group Tours

Dependent on Guide skills

Dependent on Artwork Selection

Sighted companion is dominant
Visit without a Special Tour
When visually impaired people go to museums independent from special programs, their options are limited. Some museums made their collection accessible through audio or give the opportunity to explore with touch. Others provide a multisensory experience for some of the artworks. But these solutions are rare or sometimes not even possible. There is a lack of rich exploration possibilities.

Lack of rich exploration possibilities
Multisensory solutions are rare and specific
And if these solutions are available, they do not always provide enough interesting information to all visually impaired people. The group is big and diverse, therefore these specific designs are mostly not flexible enough to meet different needs.

Visit together with a friend
Most visually impaired people go to a museum together with a sighted companion, to get more out of their museum visit. They often do not know how to get an equally balanced and interesting experience.

Unbalanced visit
Not all experiences are interesting for both
Not one solution fits all visually impaired people
1. Lack of independence
Dependent on museum agenda
Visually impaired museum visitors are dependent on the agenda of the museum. Most special programs, adjusted exhibitions or special guided tours are on fixed dates. They are not able to go to the museum whenever they want to.

Dependent on special programs
Visually impaired people are dependent on the special programs and tools that are offered by the museum. For example: a tactile representation on a tactile station in front of the artwork, a special audio tour, an adjusted multi sensory installation, or any other kind of tool that helps a visual impaired person to explore the artworks. Most museums do not offer this. This means that visually impaired people cannot explore the artwork at their museum, unless (if they offer that) go to a special guided tour of go with a sighted companion. But, also for these options there are some dependence issues.

Dependent on group tours
Visually impaired people are dependent of the group when going to special group tours. Being dependent on groups is unwanted, because of various problems. Some visually impaired museum visitors rather have the social interaction alone with their companion. Some think that some group compositions can negatively influence their experience, because each visual impaired person wants and needs different things in order to explore and understand the artwork. It sometimes go to slow, which is find annoying or it goes to quick which can be stressful.

Furthermore, visually impaired people think that the guide determines the experience. They think a guided tour is mostly about how you are being guided. For example how the guide involves them, or how the guide explains the
artwork. The tours and the guide offer special attention, information and tools to make visitors able to explore the artworks with multiple senses. These tools and this special treatment is not provided for an independent visit, without a guide.

**Dependent on artwork selection**
Artworks are pre-selected to experience for visually impaired. Which means they are dependent on the choice of museum. Rarely, are all artworks made available to explore for visually impaired visitors, mainly because this is impossible for a large collection, the museum does not have the skills or money to do so, or the museum does not take inclusivity-measures. So, the accessible amount of artworks is limited. Visually impaired museum visitors feel restricted to a selected amount of artworks. They rather choose what artworks to explore and how many.

**2. Lack of rich explorations**
Multi sensory experiences are rare
Most visually impaired visitors think that only using one aspect for one sense, like audio, does not provide enough information to get a rich experience or understanding of the artwork. Multi sensory experiences like 3D replicas of the artwork or tactile stations combined with audio are only available for a small selection of artworks or when a special exhibition takes place. These types of installations are rare, because they require customization, time and expertise for particular artworks. Therefore a lot of the artworks are not accessible for visually impaired museum visitors.

**Not one solution fits all**
The group of visually impaired people varies large. Ill-sighted individuals explore different than blind people or people that were born blind. The capability and needs of each individual is different. Also, not all information is
interesting to everyone. Think of explaining a Van Gogh, perspective or colour to someone who was born blind and to someone who just got a visual impairment a few years ago. The person born blind has never seen colour or a real Van Gogh, the person that got visually impaired has a visual memory.

3. Lack of equal social experience
Visually impaired people like to explore art together with a sighted friend, family member or partner (companions). Despite a desire to explore art together, they do not exactly know how to create an equal, balanced experience.

Sighted companion is dominant
The sighted companion is dominant in exploring the artworks. Therefore the visually impaired person is likely to experiences the artworks ‘through the eyes’ of the sighted companion. This does in most cases not leave room for own imagination and interpretation. Not only is their visit unbalanced in what they see, both are handed the same information, when for example going to a special guided tour or listening to an audio tour, when they clearly have different needs. So, to get the same level of information of the artworks is unwanted. Not all experiences are interesting for both, they need a different approach. Little to nothing is done to provide an equal balanced museum visit for visually impaired and sighted museum visitors together.

4.3 Design Goal
The design goal (DG), stated below, addresses the effect that the final concept design eventually must achieve. It is presented in the form of a statement, to hold on to while designing. The DG serves as a helping hand for design decisions in the second phase of the project.
To design a tool that assists visually impaired museum visitors and their sighted companion, to explore 2D artworks of choice, in an equally balanced, rich explorative and playful way, during an independent museum visit.

Assisting tool: A tool providing instructions and guidance to both visually impaired and sighted museum visitors on how to explore artwork together.

Together with their sighted companion: Visually impaired people being socially interactive with sighted people.

2D artworks of choice: Any kind of 2D artworks and of any type.

Equally balanced: A balanced experience for both sighted and visually impaired museum visitors when exploring the artworks, by providing opportunities and interesting information for both.

Rich exploration: Using multiple exploration options and using multiple senses to create a deeper understanding.

Playful: Entertaining and fun way of interacting and learning.

Independent museum visit: A museum visit where people can explore artworks, at any time or museum, without any help or guidance from museum programs or employees.
4.4 Interaction Vision

An interaction vision (IV) addresses the way of interacting with the designed product or service. Represented through words or images, the interaction vision should be authentic, inspiring and fitting to the design goal and is used as an analogy, not literally. Besides, interaction qualities are formed to clarify ‘how’ the design should be interacted with. The interaction vision states:

“Like rowing together, discovering new waterways.”

Figure 55: Four people rowing and one person guiding in a rowing boat (Hero Images, 2016)
This metaphor helped me to envision certain interactions between the visitors, artworks and the product I would later design.

The image represents the metaphor. The way I used this interaction vision is as follows:

the museum visitors (the oarsmen) should be equal and able to visit a museum independent (the oarsmen having equal roles in the boat), using tools to be able to explore artworks of choice, in new ways together (the oars making able to row to discover new waterways together), with a little guidance (the coxswain; the person who is not in power but steering and directing team members in the back of the boat).

With this vision I was able to create a set of interaction qualities that would help during the designing phase. This vision has the following interaction qualities:

- Independent
- Social (together)
- Equal (balanced)
- Discovering (new and interesting)
- Playful
- Rich explorative

4.5 Desired situation

This section shows a figure of the desired situation, derived from the design goal and interaction vision. The figure shows how the concept design eventually should affect its users and how they should interact with it, at a museum. The arrows in the figure show the interaction between the tool, the artwork and the users.
Figure 56: The desired situation.
4.6 Design Requirements V1.0

4.6.1 Introduction
The list of design requirements is drafted on the analysis of all information gathered on the design problem. The list states the important characteristics that a design must or should meet in order to be successful (Boeijen et al. 2014).

Each requirement derived from a design take-away. The design take-aways, phrased as could, were all reviewed. Only the most frequent (most common and repeatedly found insights during the literature and field research); surprising (new and surprising insights to me, as well as experts and/or visually impaired people); and most striking (insights that were specifically emphasized by multiple papers, interviewees and/or observees) design take-aways were chosen and were formed into a clearly formulated and concrete design objective (Boeijen et al. 2014).

The MoSCoW method was then used to make a distinction between ‘must-have’ (necessary), ‘should have’ (important but not necessary), and ‘could have’ (desirable but not necessary) requirements.

The hard requirements, which are quantifiable, are described as a ‘must, and the soft requirements, more seen as wishes, are stated with should and could.

The MoSCoW method was developed by Dai Clegg of Oracle UK in 1994.

The ‘must’ requirements include what is necessary and must be verifiable and attainable, meaning that:
• The requirement must state something that can be verified by examination, analysis, test, or demonstration. (Verification)
• Each requirement must be technically feasible and fit within the budget, schedule, and other constraints. (Attainable)
• Each requirement should express a single thought, be concise, and simple. It is important that the requirement not be misunderstood or unambiguous. (Clarity)

The most critical ‘must’ requirements, also emphasized in the design goal and interaction vision, are labelled with a star. These are for example used to quickly weight interim ideas, later on, in the design phase.

**Figure 57: Visualisation of how design take-aways transform into design requirements.**

### 4.6.2 Structure
A structured list of design requirements is vital when designing a product that copes with many aspects.

Therefore, the requirements are numbered and categorized based on overarching themes: General, Independence, Social experience and Rich explorations.

Within each theme there are sub-categories and within these categories, the requirements are ranked from
important to less important, so from ‘must’ to ‘should’ to ‘could’.
Each requirement has a number so that they are easy to refer to.

4.6.3 List of design requirements V1.0
(46 requirements)

GENERAL
1. * The design must be accessible for all women and men, of all ages and with all different types of visual impairment (blind, legally blind and ill-sighted visitors) that want to explore art at a museum (inclusive design).
2. * The design must be feasible within the museum context and within the graduation project.
3. The design must be innovative, different from programs that already exist.
4. The design must be safe to use for visually impaired people.
5. The design must be allowed at a museum, so it must not include tools restricted from museums, or should give alternatives for forbidden objects.
6. The design must be easy to carry around, have as little amount of objects (parts) as possible.
7. The design should contain easy to follow steps and as few steps as possible execute a task, in order to follow easily and be less tiring.

INDEPENDENCE
8. The design must be able to be used at least partially or as a whole, independently by a visually impaired user in a museum.
9. * The design must make an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs.
10. The design must not be dependent on the knowledge or skills of its users, in order to explore artworks.
11. The design must be understood and able to use independent from a guided tour or help from a museum employee.
12. The design must be available at all times, independent of a museum schedule and agenda.
13. * The design must provide a choice of freedom on what type and which artworks to explore (any 2D artwork).
14. The design must be able to fit into or be implemented in different exhibitions, museum spaces and buildings and smartly cover a way to tap into the differences between museums and their collections and knowledge.
15. The design must be mobile to move around with and be able to use for different works of art (instead of a fixed and specifically modified station or installation).
16. The design must provide clear guidance that fit different people (or be adaptable to the different user needs) to explore the artwork independently.
17. The design should not be influenced by time (no time limit) or speed in order to use it.

**Tools**
18. Users should be able to use their own device/phone/headphones when in need of using an app (or listening to audio).
19. The design could have similar features of other user products for visually impaired people. This could help to make parts of the design recognizable and therefore easier to understand or to interact with.

**SOCIAL EXPERIENCE**
**Balanced and equal visit**
20. * The design must provide an equally balanced experience to both sighted and visually impaired people when exploring the artwork, e.g. by providing
opportunities, tasks and tools for both.
21. *The design must leave room for own imagination and interpretation about the artwork for visually impaired users.
22. The design must avoid executing and exploring the obvious.
23. The design must not approach visually impaired people in a childish way, because of their impairment.
24. *The design must provide guidelines, information and guidance on how to explore and learn new things together, during their museum visit.
25. *The design must provide an informative and interesting exploration for all different impairs and sighted.
26. The design should use the principles of Panofsky, based on the art experience of sighted people (to help create a similar experience for visually impaired visitors, to help make their exploration equal). The design should then tap into the ‘three layers of Panofsky’ on how to understand art: 1. Looking (observation: gather visual information, without judgement: VTS), 2. Seeing (applying meaning to what is observed), 3. Thinking (Thinking about what is observed. Interpretation).

**Inclusion**
27. *The design must provide a playful interaction between sighted and visually impaired users. (Allowing them to have fun together while learning.)
28. *The design must provide a joint execution for visually impaired and sighted people.
29. *The design must make social interaction, like dialogue and conversations about artworks possible between sighted and visually impaired museum visitors. (The design must ignite social interaction, discussion or conversation about the artwork between users, give room to ask questions to one and another, to include
one another.)
30. The design must make users exchange their perspectives and critical thinking, in order to inform and broaden each other’s views.
31. The design should be able to be used by people with a different background, impaity or interest, (complete strangers should feel comfortable using the design together).

RICH EXPLORATIONS
Learning new things
32. The design must teach users something new about the artwork (eg. providing some background information of the artwork).

Multisensory aspect
33. * The design must include auditory together with tactile experiences. (Eg. give additional explanation when providing tactile information).
34. The design should include different ways, besides braille, to provide and communicate information (e.g. verbal explanation (audio), text (vision)). This way the design is inclusive and provides opportunities in use for different people with different visual impairments.

Vision
35. The design must meet guidelines for colour, contrast, font sizes (readability) and take light sensitivity into consideration for different types of visual impairment.
36. The design should consider the differences in knowledge and visual memory between people born blind, late blind, legally blind and ill-sighted.

Touch
37. The design must include some sort of tactile representation or touch experience of the artwork, in
order to gather information through touch.
38. The design must consider the level of tactile skill of people.
39. The design must be simple, avoiding use of unnecessary detail when providing a tactile experience.
40. The tactile part of the design must be organized serial and logical.
41. The design should provide tactile surfaces in such a way that there is room and opportunity to touch it with two hands.

Audio
42. The design must include a form of verbal explanation to provide information (when using headphones consider them carefully to avoid isolation).
43. The design must communicate information in a pace as desired by the users.
44. The design must communicate image descriptions serial, chronological and logical.
45. The design must communicate in a clear language with direct instructions like ‘right’ and ‘left’ instead of ‘here’ and ‘there’.

Smell, taste
46. The design should not contain a smell or tasting experience, since it is mostly too personal, can be childish or obvious. It does not provide more or better information than touch or sound.
Phase 2.
Design

This phase consists of three different sections: the ideation process, the concept development process and the presentation of the final concept design.
Design Brief

IDEATE

Brainstorming
Creative session with Peers
Creative session with Target audience
Brainwriting

60 Ideas

FILTER ON BEST IDEAS

Harris Profile

9 Ideas

SELECT ONE IDEA DIRECTION

PMI-method

Critique from experts

1 chosen idea
“The toolkit”

DEVELOP THE IDEA

Develop idea direction into a concept direction (using PMI’s)

Concept direction: “The toolkit”

DEVELOP THE CONCEPT

Prototyping

Final concept design
5. Ideation

This chapter shows the ideation process. First, the approach for ideation is briefly explained. Then, the results, including interim designs and the first concept version are shown.

5.1 Ideation approach

This paragraph explains the methods used to generate, analyse, select and develop ideas to a concept direction, develop that concept and evaluate it. These methods were key to come to a final concept design which can be tested in phase 3, with the target audience.

5.1.1 Methods to generate ideas

Creative session with Peers
A creative session was carried with 6 peers (students from Industrial Design Engineering), during the course Creative Facilitation. For the methods used I refer to the book: ‘Road Map for Creative Problem Solving Techniques’ by Heijne & van der Meer. I participated in the session, as a ‘problem owner’ (person responsible for the initial problem statement and the decision-making).

Together with the other 5 students, I formed a so-called ‘resource group’. For approximately 2 hours we actively participated during the creative process, applying different methods and techniques, to tackle the problem as given and generate ideas.

See Appendix 12 for the methods used during the creative session.
Figure 58: Empathizing exercise with the resource group during the creative session with peers.

Figure 59: The resource group and I discussing possible idea directions.

Figure 60: Delft Design Guide Creative session scheme (Boeijen et al., 2014).
The creative session with the Target Audience
The second creative session (Heijne & Meer, 2019) was done together with the target audience. The resource group contained 3 visually impaired people and 3 sighted people. They formed couples that would go to the museum together, so each couple consisted of 1 visually impaired and 1 sighted person. I facilitated the session this time.

The session lasted about 2.5 hours, including brainstorms and ideation methods. For the elaborate session plan and more information about the methods used, please refer to Appendix 13.

![Figure 61: Creative session with the target audience](image)

Individual brainstorm session & sketching
Mindmapping
Mind mapping was done to deal with the large amount of information, to retain an overview. The initial key rules, as expounded by Buzan and Buzan (1996), were followed (Tomitch, 2018, p.88). By adding all the information in a
WWW framework, I could quickly build a map and start generating ideas from there.

![Mind Map](image)

Figure 62: Mind Maps from my notebook

**Brainstorming and How-to’s**
Generating ideas with Brainstorm and How to’s (H2’s) from Delft Design Guide book, page 117 and 127 (Boeijen et al., 2014). These methods are helpful to start idea generation, I reformulated the problem in many different ways to stimulate and come up with ideas. Several input techniques were used while brainstorming as well, like criminal thinking, forced connections and sketching.

The act of sketching has a series of advantages, it can be a quick way to link thoughts and to represent small ideas, rather than only trying to verbalise them. Sketches and small written explanations were used to generate ideas in a sketching book. While sketching and writing, new ideas
were raised. Also, by putting these ideas on paper they became clearer and sometimes evolved into a new idea. Sketching was done in an individual setting. Note: During sketching, the design requirements was sometimes ‘temporarily forgotten’ or one idea was focused on one specific requirement, to support the creative process and keep the idea generation process going fluently.

Figure 63: Idea sketches from process book

**Brainwriting (variant)**
Together with one other student I did the brainwriting technique, to generate ideas. We each wrote down a subproblem (e.g. “How can visually impaired people get tactile information about a painting through their sighted companion?”) on a sheet of paper, then each of us wrote ideas on the piece of paper, in silence.

After a few minutes we passed on the paper, to use the others’ ideas as a stepping stone to generate further ideas. We repeated the process for a couple of sub-problems.
5.1.2 Methods to select ideas

Harris Profile
After ideation was done, a Harris profile (Boeijen et al, 2014, p.139) was used to select the best fitting ideas. The Harris profile was based on the 12 vital ‘must’ design requirements (see page 157 & 158). Since there are 12 vital requirements, the Harris profile has a range from -24 points being lowest and +24 points being highest to rank ideas with. This method helped me to filter to the best fitting 9 ideas (scored above 12 points).
5.1.3 Methods to analyse the selected ideas and choose one idea

PMI
Then, I used the Plus-Minus-Interesting (PMI) Method (Boeijen et al, 2014, p.145) to analyze the 9 selected ideas and be able to present them all to design experts. The PMI method helps to list: What is good about the idea (Plus); Which aspects would I need to improve (Minus); and What makes the idea interesting (Interesting).

![Diagram](image)

*Figure 66: Delft Design Guide, PMI Method (Boeijen et al., 2014).*

Design Critique from Experts & choosing one idea direction
The list of PMI’s helped me to communicate strong and weak aspects of my ideas to experts. The 9 selected ideas in the form of sketches, together with interesting insights from the PMI list were presented to experts. I asked two experts (both experts in the field of working with visually impaired people and one of them also working at a museum) to evaluate the 9 ideas that scored highest on the Harris profile. Experts quickly saw pitfalls and promising ideas. Experts helped me to choose a direction, by providing me with valuable tips and critique. From there on I chose the idea they found most fitting.
5.1.4 Methods to develop the idea into a concept
Develop good Ideas with PMI-method
After choosing one idea from the 9 ideas, together with experts, I again looked at the list of PMI’s from the other 8 ideas. I listed the most striking, according to experts, Plusses (P), Minuses (M) or Interesting (I) aspects of each idea and translated those into design take-aways. They could help me improve the toolkit idea and create a concept.

5.2 Ideation Results: Ideas to concept V1.0

5.2.1 Generated ideas
In total, 60 ideas were generated through the different methods: the creative session with peers; the creative session with the target audience; brainwriting, and; individual brainstorms and sketching.

The 9 selected ideas
This paragraph shows 9 selected ideas from the 60 generated ideas, based on the scores of the Harris profile. The ideas shown, scored above 12 points. The other ideas, the ones that scored below 12 points for the Harris profile, can be found in Appendix 14.

For the Harris profile, the star design requirements were used to give points to ideas, because these were the most vital design requirements. Below, these requirements are numbered with Roman numerals and short names, to easily refer to them.

I: For different visual impairments, (star requirement 1)

II: Independent museum visit, (star requirement 9)

III: Social interaction (together), (star requirement 29)
IV: Equal experience (balance sighted and visually impaired), (star requirement 20).

V: Room for own imagination and interpretation (equal), (star requirement 21)

VI: Joint execution (sighted and visually impaired), (star requirement 28)

VII: Playful interaction, (star requirement 27)

VIII: Informative and interesting for both (sighted and visually impaired, (star requirement 25).

IX: Auditory together with tactile exploration (multisensory), (star requirement 33)

X: Guidance (Guidelines on how to explore together) (assistance), (star requirement 24)

XI: Choice of freedom (any type artwork, (star requirement 13)

XII: Feasible, (star requirement 2)

The ideas are presented with a brief explanation and the scored points from the Harris profile.
A cardset with different shaped cards. Each card has a different purpose and should trigger different senses. User gets a box of cards at the entrance. Each cardset belongs to a painting and provides information. The cards are recognized by shape and colour and each card communicates something else and teaches users something new about the painting. For example: round blue cards are: sound cards; white square cards are tactile drawing cards; Red triangular cards are: scented cards; etc.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
2. Enact/mimic the painting - **Harris score: 13**

A game to help enact the painting together with sighted companion. A game with assignments to do with moving your body and hands. Feel postures of eachother’s body and hands and experience yourself.

Also, comes with an app that provides background information of the painting, you have the choice to listen to it, or just mimic only.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
3. Mini tactile booklet - Harris score 17

A booklet with mini tactile drawings of all paintings from the exhibition. The tactile line drawings can be made upfront by personnel, artists or volunteers. In this way as many paintings as possible can be made tactile. Visitors walk through the museum together, with the booklet, and ‘touch’ each painting that way. Each tactile painting comes together with a QR-code to hear a verbal explanation, that guides the user through the drawing. Audio (image description) and touch is combined this way. Each painting can be heard and touched.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
4. Describe and draw - Harris score: 16

A tactile drawing board, special pen and a booklet with instructions and examples how to draw. This set can be used for visually impaired people together with their sighted companion, to explore art together. The sighted companion describes what he sees and draws the painting on tactile paper or the visually impaired person draws on paper. They create what they see, discuss and feel.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
5. Instruction toolkit - Harris score: 20

The toolkit (booklet) provides guidelines, step by step, to observe artworks together. By following instructions they can get a better understanding of the artworks. The visitors are assisted to describe, listen, draw and discuss. The sighted person can follow steps on how to describe a painting to their visually impaired. Then, they can draw what they want about the artwork on tactile paper. Then, critical/fun questions can be found in the booklet to ask each other. Finally, they can get background information of the painting through audio.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible

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6. Instruction toolkit App - Harris score: 13

An app that provides tools, allowing users to help each other understand the artwork. Similar to idea 5, but fully digital. Users can find guidelines in the app and listen to them. Guidelines on how to describe the artwork (from sighted person to visually impaired). They can draw on the screen and feel the screen, for this, the technology haptography is used (a digital screen that provides tactile information through vibration). They can listen to questions about the painting to answer together. Finally, they can scan a QR-code, to get background info.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
7. Tactile drawings from others - Harris score: 14

In front of each artwork the visually impaired and their sighted companion can find tactile drawings of previous visitors. Also, each artwork has a scanning (GR or recognition) function for audio background information. They can scan with an app. With this app they are free to choose what artworks to walk across. They can touch the tactile drawings, listen to the audio and ask each other questions. Also, at the end of the visit, visitors can make their own tactile drawings, to leave behind for the next.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
8. Tactile cards & critical questions - Harris score: 18

The sighted and visually impaired companion get cards with tactile representations of the artworks and critical questions on the back of the cards (audio questions-scan through app QR code). They can choose what artworks to walk across and ask and speculate together by answering the questions. (Also possible to get random critical questions through headphones, about the artwork or critical questions to analyse more. Getting questions through headphone makes it also accessible for blind people, instead of cards only.)

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
Companions scan a QR code in front of the painting. Their phone then provides music or sounds, or maybe even smell through headphones. This allows visually impaired people to listen/smell what is in front of them. They do not get descriptive text. The sighted only uses eyes. Together, therefore, they can discuss what it could be, based on their own interpretations. The visually impaired person from sound/smell, the sighted from seeing. Eventually, they press a button (as a choice) to get the “correct” real information.

I: For different visual impairments
II: Independent museum visit
III: Social interaction (together)
IV: Equal experience
V: Own imagination/interpretation
VI: Joint execution
VII: Playful interaction
VIII: Informative/interesting for both
IX: Auditory and tactile experience
X: Guidance
XI: Choice of freedom
XII: Feasible
5.2.2 Chosen idea direction with experts
The 9 selected ideas, together with interesting insights from the PMI list were presented to experts from Kubes, Beelden aan Zee museum and Bartiméus.

The experts saw great potential in the toolkit idea because it creates a joint experience. The toolkit helps both companions to be involved and not experience art separately (for example, one of them listening to an audio tour and the other joining a guided tour).

Secondly, they found the toolkit interesting because it is independent from any tool, employee or agenda that the museum should offer; and independent from having a skill in order to execute it, because it guides the users on how to use it.

Also, it could work in many fields, besides the museum context, where sighted and visually impaired people learn to communicate about something visual that cannot be touched. “Guidelines and instructions on how to explore together, as a sighted and visually impaired person, can help in many fields and is very promising”, one experts said.

Moreover, they liked that the toolkit is relatively easy to implement and feasible for in any museum. They saw potential of expanding the toolkit further in the future as well, which is positive and interesting. And, other aspects from other ideas, like mimicking and asking critical questions could also be added to the toolkit.

Furthermore, they were positive about the exploration possibilities, so, describing, drawing, questioning. On the one hand the toolkit provides exploring by “the self” first, rather than getting information from the museum first and
be influenced that way. One of the experts referred to the Visual Thinking Strategy (VTS) method (after hearing about the toolkit). She was positive about this approach where visitors first look what is there and then interpret, and found this enriching for the experience. She said: “The VTS method is based on ‘what do you see, what do you see, what do you see’. I have experienced that twice now and found it enriching”. On the other hand they found the exploration options rich: ..“other senses than looking are touched by involving the hearing (listening to each other) and the sense of touch (drawing and feeling), which is positive.”

Moreover, one expert stated that: “both the sighted supervisor (companion) and the visually impaired person will see the artwork better, one by describing the artwork, the other by building the artwork in his / her imagination.”

The experts showed curiosity, in a positive way, on for example how such image description guidelines, to describe objectively, would look like. “I have hardly any experience with an official image description”. Also, one of them, often giving tours to visually impaired people, added: “Guides who give too much input and associations themselves can be considered annoying. I have indeed noticed that my associations (often reasoned) are sometimes different from those of the blind in my groups. So, I try more and more not to be steering, whereby I do share my own knowledge, but leave room for their own experience and interpretation.”

However, they did have some remarks on how drawing can be tricky and that it needs some thought, were they sit down and how they would overcome a barrier to start drawing. From my own experience: I am not good at drawing. Must be a barrier to this overcome for some, so
how do you deal with that?” But, they encouraged me to continue with the idea of the toolkit.

So, the advice from experts, together with the highest score on the Harris profile was my motivation to prototype and develop the toolkit idea, as it seemed the most fitting and inspiring direction.

5.2.3 Developing the idea direction into a concept
Below, for each of the other 8 ideas (besides the toolkit idea) the most striking, according to experts, Plus-Minus-Interesting (PMI) results are shown. I used these PMI’s to create design take-aways. These take-aways were used to improve the toolkit idea into a concept. (The full list of the PMI’s, for each of the 9 ideas can be found in Appendix 15)

Idea 1: Cardset
P: Provides a playful multisensory experience, because the cards each provide a different interaction and different function to choose from.
P: Provides information in a fun playful way, because the cards look and feel attractive and inviting to interact with.
I: The cardset is an inclusive design because the shaped cards are recognized by touch for blind people, and the primary colours of the cards can help for ill-sighted users too.
I: Provides multiple exploration possibilities in one set.

Design take-aways:
• The toolkit could consist of fun and playfully shaped cards, that look and feel attractive and are inviting to interact with. The toolkit could, in this way be more inclusive, design-wise. The different bold colours and simple shapes of the cards are recognizable by touch and remaining vision easily.
• The toolkit could provide a choice between tools and what way to explore and give a choice for its users between different exploration possibilities.

Idea 2: Mimic the painting
M: Users can feel uncomfortable or have a lack of confidence to mimic or enact the painting.
M: Without clear instructions on how to mimic or enact the painting it can be hard to know what to do for an abstract work of art.
M: Mimic as the only option, would be too minimal.

Design take-aways:
• The toolkit could give clear instruction about how users can mimic a painting, in order to give them more confidence.
• The toolkit could provide more exploration possibilities besides mimicking artworks to choose from, since not everyone is comfortable doing it right away.

Idea 3: Mini tactile booklet
P: Provides simple touch experiences for all artworks, yet better than no touch experience at all. Even if it is a little line drawing, it can help understand verbal explanation better.

Design take-aways:
• The toolkit could provides tactile drawings, only when they are independent of what the museum provides.
• The toolkit could be flexible for multiple solutions, by making visitors make tactile drawings themselves.

Idea 4: Describe and draw
P: Provides an active participation of the sighted companion to describe and draw and involve them.
M: Visually impaired person is still dependent on the skill
of their sighted companion since there is no guidance provided on how to describe or draw.

**Design take-aways:**
- The toolkit could provide an active participation for the sighted companion by making them draw or describe the painting.
- The toolkit could provide a clear guidance and explanation to the user on how to draw a painting.

**Idea 6: Instruction toolkit App**
I: A network online provides of many opportunities, volunteers that can provide images etc.
M: Too many instructions can be boring.

**Design take-aways:**
- The toolkit could consist of a network of volunteers online to provide information.
- The toolkit could not provide too many instructions, or it could get boring.

**Idea 7: Tactile drawings from others**
I: Touching different tactile drawings of different people can be a reason to come back to the same exhibition and have a different experience.

**Design take-aways:**
- The toolkit could give a reason to come back to the same exhibition, but still give a different experience.

**Idea 8: Tactile cards and critical questions**
I: Questions can be asked by the visually impaired, hearing questions through a headphone randomly gives them power in the specific task.

**Design take-aways:**
The toolkit could make visually impaired people be in charge of parts of the toolkit and for other parts the sighted person, to also create a balance in that way.

Idea 9: Different interpretation
I: Discussion, speculation and exchanging interpretations provide a new way of getting information. The interesting thing is then for the duo to choose whether they want to hear the actual information about the artwork or if they are content with their own findings.
I: Interesting order in which this exploration goes: (1.) Gathering visual information/observing (looking for the sighted and listening for the visually impaired companion), then (2.) Applying meaning to it by discussing and exchanging thoughts, and finally (3.) Interpret and reflect by choosing to get the ‘actual information’ provided by the museum. Connecting and comparing to “the right” answers. A link to Panofsky’s layers on understanding art.

Design take-aways:
• The toolkit could first stimulate discussion, own speculation and exchanging own interpretations about the artwork and then provide the visitors with the actual background information.

• The toolkit could provide this order of exploration: (1.) Gathering visual information/observing (looking for the sighted and listening for the visually impaired companion), then (2.) Applying meaning to it by discussing and exchanging thoughts, and finally (3.) Interpret and reflect by choosing to get the ‘actual information’ provided by the museum. Connecting and comparing to “the right” answers. (Panofsky: 1. Looking (observation: gather visual information. VTS), 2. Seeing (applying meaning to what is observed), 3. Thinking (Thinking about what is observed. Interpretation)).
5.2.4 Concept V1.0

Brief explanation
A toolkit (in form of card set/app/booklet) that can be used by visually impaired museum visitors together with their sighted companion at any time or museum (independent of special tours) to explore and enjoy art together. The toolkit can be used in different ways of their own choice, providing different playful exploration options. It is intended to use at the museum to explore 2D paintings of any kind (figurative, abstract and in between).

The toolkit is designed for museum visitors with a visual impairment and their sighted companion, to get a better understanding of the 2D artworks at a museum, by working together. The cards or/and booklet-pages or/and the app gives multiple options and exercises to look and describe (observing objectively, without judgement, based on VTS (2020)), feel tactile information, draw a tactile drawing and/or mimic the painting. Both sighted and visually impaired people can first observe the artwork this way and interpret it in their own ways, then discuss and agree or disagree on facets of the painting. To eventually get an understanding.

The toolkit consists of three layers: Based on The layers of Panofsky’s principles on understanding art.
- Layer 1 includes: ‘describing objectively’. This layer of the toolkit covers Panofsky’s layer 1 (observation): gathering visual information. (observing without judgement, like with the method Visual thinking Strategy (VTS).
- Layer 2 consists of: ‘drawing (tactile)’, ‘touching/feeling’, ‘enacting/mimicking’ and ‘critical questioning’ of the artwork. This layer of the toolkit is about applying meaning to what is observed, by discussing thoughts, exchanging perspective, imagination, and interpretations. This step covers layers 2 & 3 of Panofsky.
- Layer 3: ‘getting background information’. This last layer is optional and also partially belongs to layer 3 of Panofsky. Visitors can choose to adopt the information, or they can refine their own interpretation after getting “the answers”. This layer of the toolkit can be placed in Panofsky's 3rd layer, once they further interpret or it can be used to reflect on what they found.

Panofsky’s layers include: 1. Looking (observation: gather visual information, without judgement: VTS), 2. Seeing (applying meaning to what is observed), 3. Thinking (Thinking about what is observed. Interpretation.); & Visual Thinking strategies is a learning method which teaches people to perceive, observe, listen to and build on each other without judgment by looking at works of art (VTS, 2020)

<table>
<thead>
<tr>
<th>LAYERS OF PANOFSKY</th>
<th>THE TOOLKIT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Layer 1: Look</strong></td>
<td>Purest perception without judgement. (VTS)</td>
</tr>
<tr>
<td>Observation: gathering visual information.</td>
<td>Describing the artwork</td>
</tr>
<tr>
<td><strong>Layer 2: See</strong></td>
<td>Analysis and Interpretation.</td>
</tr>
<tr>
<td>Applying meaning to what is observed.</td>
<td>(Tactile) Drawing the artwork</td>
</tr>
<tr>
<td></td>
<td>Enacting the artwork</td>
</tr>
<tr>
<td></td>
<td>Talking about the artwork</td>
</tr>
<tr>
<td></td>
<td>Touching the artwork</td>
</tr>
<tr>
<td><strong>Layer 3: Think</strong></td>
<td>Optional: Reflect on interpretations, with ‘right answers’.</td>
</tr>
<tr>
<td>Thinking about what is observed.</td>
<td>Listening to background information about the artwork</td>
</tr>
</tbody>
</table>

Figure 67: Panofsky’s layers and VTS connected to the toolkit layers.
Layer 1: Perceiving information, looking for the sighted and listening for the visually impaired companion.

This Layer consist of one toolkit component (component 1A): Instructions to image description. It provides guidelines for sighted companions to communicate the image to visually impaired companions. Sighted visitors explain according to image description guidelines.

Layer 2: Processing the information, discussing and exchanging thoughts.

This Layer consists of multiple components to choose from. The companion can choose between exploration option to explore and create a deeper understanding of the artwork.

- Component 2A: Drawing. Drawing for the sighted or visually impaired on tactile paper to communicate information, like composition and shapes or thoughts, like emotions or interpretations, with each other.
- Component 2B: Enacting/Mimicking the painting. Stand or shape your hands in positions of the characters in the painting.
- Component 2C: Feeling textures and materials. This component is about speculating what textures and materials from in the painting would feel like.
- Component 2D: Critical questioning. Companions ask each other questions to trigger conversation, start discussion and exchange thoughts.

The toolkit provides an independent way to explore artworks.

Layer 3: Actual background information, choose to get “answers”.

Then, after using the toolkit, visitors can choose whether
they scan the painting (either the take a picture of the painting or a barcode next to the painting) with the toolkit museum app (component 3A), to get little background information about the artwork. This application is rather simple, providing little actual background information per artwork. After using the toolkit, they have the choice to listen to or read this information. They can also choose to only read additional information next to the painting on the wall (if it is there) or not listening to any background information, but rather only be content with their own findings with help of the toolkit.

The application comes along with the toolkit, where museums only need to have a short background story of each painting, which in most cases they have.

**Components**
The toolkit consists of:
- Component 1A: Instruction cards/booklet with text for description.
- Component 2A: Instruction cards/booklet with text for drawing.
- Component 2AA: A drawing pad with tactile paper and a pen.
- Component 2B: Cards/booklet with instructions on how to mimic or enact the artwork.
- Component 2C: Cards/booklet pages with textures and materials.
- Component 2D: Instruction cards/booklet with critical questions.
- Component 3A: An app to scan paintings and get background information about the artwork.
Interaction storyboard

1. A visually impaired person and his sighted friend go to a museum of choice, on a random Wednesday.

2. They get a warm welcome when they enter the museum. They ask for the toolkit.

3. They receive the toolkit to explore the artworks together independently.

4. The friends start their museum visit and pick an artwork of choice.

5. They stop in front of an artwork of choice and unfold the toolkit. The first cards to use within the toolkit is: Image Description.

6. In this first step the sighted companion needs to follow the guidelines to describe the painting to the visually impaired, in an objective, factual and analytical way.
7. While the sighted person describes the painting, his friend listens. The guided approach provides structure and helps to create a clear image of the painting, but leave room for own imagination of the visually impaired friend.

8. Both learn new things. Gathering visual information of the artwork. The sighted friend gets the information by looking and describing closely. The visually impaired friend listens and builds the image in his mind.

9. The second step is about getting a deeper understanding. This step has multiple options to choose from. They choose for tactile drawing.

10. The sighted friend draws what he sees on the tactile paper and the visually impaired friend what he thinks the painting looks like. Again, they can follow steps to create the tactile drawing, the guidelines encourage and help them to unfold the image and their minds further.
11. They exchange drawings to feel and discuss them. Speculate together. Ask questions and get a deeper understanding of the work or each others interpretations.

12. Then, the choice is theirs to either use another set of cards to explore the same painting further, or to use the app to get actual background information or proceed to a next artwork.

13. They choose to scan the artwork with the app for more background information. After hearing this information they reflect on their own findings.

14. They are happy with what they learned, they decide to move on to a next artwork. For the next artworks they can use the same approach or mix it up, by using different cards.

15. After many explorations, they go back to the desk, deliver the toolkit and keep their souvenir drawings as a memory!
6. Developing the concept

This chapter shows the approach and results to develop the concept V1.0 into a final concept design. In the last section, the new, more detailed list of design requirements (V2.0) is presented.

Note: *Due to the corona lockdown it was impossible to execute the prototyping phase in the museum and with the target audience. The chosen concept direction was mostly prototyped with peers (students) and other sighted people that roleplayed, in a simulated space (at home). The usability test however was done with the target audience.*

6.1 Approach to develop the concept

6.1.1 Methods to prototype

**Interaction Prototyping**

Interaction prototyping helped me to test the different variables of the concept (Tomitsch, 2018, p.21). With this type of prototyping different aspects of the concept were tested, until they worked effectively in the scenario. It was used to assess aspects of the concept to develop a new version of the existing concept. This type of prototyping was repeated a couple of times during the development process.

These prototyping sessions were done with peers and people from my environment, different age and gender. The participants were not visually impaired, but either blindfolded or provided with glasses to mimic a visual impairment.

The prototypes were “low-fidelity” prototypes, a quick and easy way to translate high-level design concepts into tangible and testable artefacts (Boeijen et al, 2014, p.131).
The tests were used on a small scale to test the experience of participants.

6.1.2 Methods to evaluate
Testing concept to the design brief
To evaluate interim concept versions, there was a constant going back and forth to test the concept to the Design Goal; Interaction Vision, The Design Requirements and the personas.

To evaluate the concept to the personas, a persona-based walkthrough was used (Tomitsch, 2018, p.99) (Boeijen et al, 2014, p.95). The build archetypes from the previous phase were now used as testing criteria for the chosen concept. Would this person use this concept? And how? Or why not? In this way, the concept was tweaked a bit to a developed version. This was done as an in-between step to evaluate the design, before prototyping it with real participants.

6.2 Results: Concept development

6.2.1 Prototype results
This section shows insights gathered from different prototyping sessions. Either a specific aspect of the toolkit or the toolkit as a whole was tested. The insights (negative and positive) for each prototyped aspect, are listed below. The insights are translated into design take-aways to later serve as input for the final concept design.

The different aspects prototyped were:
1. Image description:
Describing an image done by the sighted companion (with and without guidelines on how to describe) and listening to an image description by the visually impaired companion, in this case a blindfolded participant.
2. Tactile drawing:
Drawing a tactile line drawing of an artwork as a sighted companion (with guidelines on how to make a tactile drawing) and recognizing that tactile line drawing by the blindfolded participant, through touch.

3. Touching Materials:
Touching different material swatches and fabrics -both blindfolded & sighted-, connecting them to the artworks.

4. Mimicking / Enacting:
Mimicking an artwork with hands and enacting with total body; feeling the sensations of the position or each others position.

5. Critical questioning:
Asking critical questions to one another, either reading them from question cards or listening to them through the app (with headphones).

6. Background information about the artwork
Listening to short background information about the painting.

7. The toolkit as a whole
Testing the order in how it is best executed, the flow of the tasks and the layout of the cards and tools.
1. Image description (describing and listening)
The guidelines created for image description were based on different studies and originated from different sources combined. The most important ones are listed below:

- Tips on how to describe artworks by experts from Kubes (foundation to make art and culture accessible) tour guides (interviews and observations during field research with Kubes and Escher museum).
- Audio Description Guidelines by The American Council for the Blind (ACB), who use the W.Y.S.I.W.Y.S. method (What You See Is What You Say), meaning that a person describes what you see without interpretation or personal comment.
- “Be objective: Stick to the facts, avoid analytical interpretations or emotional responses”. This source serves as a useful set of guidelines for audio describers, (ACB, 2003).
- Descriptive guidelines, on how to be brief (avoid redundant phrases), logical and accurate by Association on higher education and disability (2020).
- Suggestions on how to describe pictures for the blind by visually impaired photographers: an articles on how to be objective and how to avoid personal impressions, so they cannot overbalance (Schmid, E., 2015).

Guidelines on how to describe an image and tips and tricks from these sources, were combined to use as a starting point. Guidelines on how to describe the artwork was developed according to my prototype insights.
Without guidelines: Describing an image & recording it.

Figure 68 and 69: Whatsapp message I send to participants with a picture of a Chabot painting.

Most participants liked to explain what they saw. They found joy in helping someone who is visually impaired.

- Most participants found it hard to describe something without any clear guidance, how to handle their approach to someone who is blind (where to start and end). They tend to describe out of their own experiences and their interpretations.

Listening to a recorded image description (given by someone without guidelines)

Figure 70 and 71: Participants listening to an audio recording of people describing the Chabot painting.
All participants found it fun to hear an image description by others, especially when coming from a voice they recognized.

- All participants found the description was too interpretive and emotional, with little room to create an imagination themselves. They also thought most people did not tell a structured, logical story. They found them chaotic and mostly hard to follow. All participants first wanted an image description, before hearing someone’s interpretation or linked emotion. All participants missed social interaction, since they could not respond to the audio with questions.

**With guidelines: Describing an image in person.**

*Figure 72 and 73: Participants describing an artwork, according to the guidelines.*

Guidelines were useful and make it easier and more relaxing to describe an image. All participants looked differently (more detailed, careful, logical and focused) to an artwork once they used the guidelines. They described the image more objectively, factual and literally with than without guidelines. When “interrupted” by the blindfolded participant, they always managed to continue after the questions, because they had the guidelines. All participants were more attracted to colourful, bold and
short instructions rather than long black and white texts. All preferred when they were provided with questions that are easy to interpret and to answer. Example: What kind of artwork is it? Painting, Drawing, Photo, Print, Collage, … .

- All participants skip too long sentences and too many instructions. Most of them found words as figurative, objective or, abstract too hard. They preferred more direct and simple words or a brief explanation. To avoid the old pattern of describing an interpretation or emotion, guidelines must be strictly followed. Participants should be pointed out, again and again, to follow each step carefully.

“I want to use the guidelines in a quick easy way, not having to read through a lot of texts and difficult words.”

Listening to an image description in person (given by someone with guidelines)

![Figure 74: Participant listening to an artwork, according to the guidelines.](image)

+ All participants enjoyed listening to their companion, giving the description. They actively listened, asked questions and started social interaction. Most participants preferred when the describer read the guidelines out loud
to follow along.

+ All participants wanted to be included in the decision-making of the sighted person, to feel equally important. Therefore, all participants liked the first step of the guidelines, where they form an impression and are asked if they want to continue with this artwork. This way the visually impaired visitor has a choice on what artwork to explore. Also, for each part of the image description they liked to have a choice like what detail they wanted to explore further and get more information about.

“Doing it together is fun!”

**Design take-aways for image description:**

- The toolkit could give clear instructions and guidance to sighted companions on how to describe an image literally (without own interpretations and/or emotions), in order for the visually impaired person to follow and have room for their own imagination.
- The toolkit could provide an opportunity to discuss interpretations and imaginations, but only after visually impaired people got literal information about the image, such as a clear image description.
- The toolkit could ask questions (providing a choice) asking both the sighted and visually impaired user to be equally important. For example: “Decide together what detail needs to be described”, instead of: “describe an important detail.”
- The toolkit could provide questions that are easy to interpret and answer, like giving answer suggestions and writing short sentences. Example: What kind of artwork is it? Painting, Drawing, Photo, Print, Collage, ….
2. Tactile drawings (drawing and touching)
Drawing a tactile line drawing of an artwork, according to guidelines

Note: Drawing guidelines were based on Tactile drawings by Dedicon (www.dedicon.nl), guidelines on how to make a tactile drawing (Veld & Rieken, n.d.) and the Bartiméus website on tactile drawings (www.tactieletekeningen.nl/). Guidelines and tips from these sources were combined to use as a starting point. This first version of guidelines on how to draw was developed according to prototype insights, see Appendix 16 for the first version.

![Figure 75 to 78: Drawing rubber board prototypes and special drawing sheets.](image)
All participants thought drawing works quick to make (parts of) an artwork tangible at the spot. All blindfolded participants found drawing hard, but not impossible. They had fun while drawing, requiring concentration and effort. They liked to be forced into thinking differently and creatively. When they started to follow the guidelines and found out that the essence of drawing was communicating information, not the beauty of it, they build confidence while doing. Most participants also found drawing helpful to get a better understanding of the artwork, its details, shaped and composition. They thought drawing provided a new perspective towards the artwork, with more attention for detail. All blindfolded participants preferred when their sighted companion talked out loud, while drawing, so that they could follow along and feel connected.

With regard to the guidelines: Most participants found examples of clear line drawings helpful to create a suitable tactile drawing themselves.

All participants needed clear instructions, step by step, to know how to draw a clear tactile line drawing. Otherwise,
they drew either too small, too detailed, too soft or too random.

“The guidelines make it really easier to start.”

**Design take-aways for tactile drawings:**
- The toolkit could provide clear instructions for drawing, including clear steps and examples.
- The toolkit could provide encouraging words to build confidence.
- The toolkit could provide a drawing pad that is easy to carry around (hang around the shoulder) and have free hands to use other parts of the toolkit as well.
- The toolkit could provide a drawing pad with a hard drawing surface and an integrated place for the tactile drawing sheets.

**Recognizing tactile line drawings by touch blindfolded.**

*Figure 80 to 83: Participants feeling tactile drawings with & without explanation.*

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All blindfolded participants found a verbal explanation useful while touching the drawing of their companion. Then drawings were insightful and fun and helped to understand the shapes and composition. Participants had a lot of ‘aha-moments’ when explanation was combined with touching. Conversations also started easily.

"My own imagination worked really well with the explanation while touching. I got the essence of the painting and also my own interpretation."

"Such a nice way to listen to the description, I can follow the story with my hands."

- All blindfolded participants had trouble tracing lines when they were smaller than A4, too detailed or lines drawn too close to each other (see figure 84 to 87 for examples). All participants found that tactile drawings were useless without any explanation. Most participants found details harder to understand/feel than composition and shapes.

Figure 84: (Sizing) The smallest size was hard to recognize and took more time than the biggest size (A4).
Design take-aways touching tactile drawings:
• The toolkit could encourage sighted users to explain and guide the visually impaired user with verbal explanation while touching the tactile drawing.
• The toolkit could include tactile drawing sheets A4 size.
• The toolkit could encourage to draw with one line, not too detailed, simple, bold and lines not too close to each other.

3. Touching different materials or fabrics
This aspect focuses on touching different materials blindfolded and connecting the materials to the artworks. Swatches of different materials, like rubber, plastic, wool, cardboard, textured carpet, vinyl and more, were put together on a keycord. Together with some guidelines on how to use it with examples of what the participants could do with it, this part developed along with the prototyping phase. As a starting point, some inspiration was gathered from: ‘Voeljeboekje’, meaning ‘feelingbooklet’, a fabric tactile book in which children with a visual impairment are encouraged to explore the world by touch. The book is a starting point from which they can explore together. Which one feels different? What is different? The form? Or is it bigger or smaller, thinner or thicker (passendlezen.nl, 2008).
Figure 88 to 90: A keycord with different material swatches and multiple different fabrics with different textures to sort and test.

+ As soon as the participants touched the different materials, they started conversations and exchanging thoughts. Most of them found materials of a different kind (plastic, rubber, leather see figure 88) interesting for abstract art, and could interpret it literally and emotionally. Participants found it joyful that the visually impaired companion was in charge while touching the materials. Here the guidelines are for the visually impaired people (unlike guidelines for describing and drawing). All liked that there were enough (15+) fabrics that differ in touch (slightly or a lot).

- Most participants had difficulties judging how the prints and patterns of presented materials feel, such as a sample of plastic with a wooden print. Some participants were confused whether they needed to talk about the materials
found in the painting or what the painting was made of.

**Design take-aways for Touching materials:**
- The toolkit could make the visually impaired person in ‘charge’ of the touching materials part.
- The toolkit could include at least 15 material swatches of materials that differ in touch.
- The toolkit could include examples on how to use the material swatches.

**4. Mimicking/Enacting an artwork**
This aspect focuses on mimicking or enacting an artwork with poses and hands, aimed to feel the position or each others position. This aspect was inspired by the tours at Escher museum and museum Beelden aan Zee. People tend to use hands, put each other in position while talking.

![Figure 91 and 92: Examples of how to mimic a person or figure.](image)

+ Mimicking helped participants to better understand emotions felt by the characters in the artwork. It adds an extra layer of speculating and feeling emotions. Some participants found that small gestures with hands and arm also helped to enact a part of the painting. See figure 91 and 92. Also for mimicking, guidelines helped as inspiration and examples, like changing roles (putting or standing in position) or using hands for objects.
“Sitting and bent down this way feels sad. Does she look sad too? Like a sad facial expression?”

- For some participants the thought of enacting in a public environment felt uncomfortable, therefore it should be considered optional (not a must).

**Design take-aways for Mimicking:**

- The toolkit could provide mimicking guide instructions and inspiration on how to mimic, using examples, like changing roles (putting the other or standing in the position of a person from the painting) or using hands to mimic objects.

**5. Asking critical questions (provided) to one another with question cards.**

This aspect is about asking each other personal, emotional and critical questions about the artwork. To exchange thoughts and start discussions. This aspect was inspired by many studies and tours, since studies say asking questions is important to get to know more information. Also, tour guides asked such questions after they gave image descriptions or tactile information with verbal explanation,

*Figure 93 and 94: Question cards with different lay outs and questions.*

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to let imagination and interpretation grow. The questions on these cards were inspired by an article called: “82 questions to ask about art”, by an art class curator Cindy Ingram (2016) and the questions tour guides asked visitors during the tours I observed during field research.

† Most participants used the question cards as inspiration. The examples ignited creativity and started conversation quickly. Most blindfolded participants liked to be in charge, the idea of having the option with the app for this aspects was also found positive (where visually impaired people could press a button and hear a random question through their headphones to then ask their sighted companion). For some ill-sighted people the cards still could be used if the font size is big (16pt or bigger) and in Sans Serif.

- Headphones are not always convenient, neither is an app. So the sighted companion might use the cards.

**Design take-aways for critical questions:**
- The toolkit could provide an alternative for the questions on the cards, by providing them on the app as well.
- The toolkit could provide examples of questions to ask each other, to get inspired in the way of thinking.

6. **Background information about the artwork**

Note: The app, to scan the artwork for background information, was not prototyped. However, the participants were given some background information if they wanted. (Artist, year, name and a short description). I found that it was random whether people asked for background information. It differed between people, the type of artwork and their knowledge. Most did not ask about it. I mainly focused on the cards of the toolkit.
7. The toolkit as a whole

Walkthrough, flow, order
This session focused on the toolkit as a whole, its process, order of the different elements and layout. A part of Visual Thinking Strategy (VTS) was used to form the order of the toolkit (https://www.vtsnederland.org/). People first look at a painting and later get information of the painting.

Most participants found the toolkit an educative tool to really look at art differently. They were comfortable to follow simple steps. All participants found it helpful to read instructions upfront (at home). Clear instructions resulted in more fun and a better flow once using it. All participants learned along the way, the second time went better than the first, the third time went better than the second.

The order in which all participants agreed to work best, turned out to be Image description first.

Most participants did not want to follow too many steps, this would feel intimidating. Too many options will kill, and guidelines should not be too long. Simplicity is key.

Lay-out of the toolkit
All participants preferred colourful, high in contrast, playful shaped, bold, simple cards. This way, they are easier to understand as well. They addressed their preference for cards, rather than a ‘book’. All participants liked an inclusive design for touch and vision, using distinct shapes and colours for different set of cards.

All participants found it helpful to refer to steps with numbers, see figure 95.
Figure 95: Toolkit numbers step by step and different layouts for the description cards.

Figure 96: Toolkit different lay out prototypes.

Figure 97a: Toolkit Keycord to attach to the cards.

Figure 97b: Toolkit layout with numbers on the back of the cards.
Figure 98: Moodboard toolkit. (Do don’t game, 2020); (Bol.com, 2020); (Amazon toys, 2019); (InTACT, 2020).
Material choices:
Big, simple, minimalistic, high in contrast, colourful paper cars with a durable coating, that it lasts longer and cannot rip easily, because of the attached ring. Text should be Sans Serif, 16pt font size or bigger, and put on a matt surface to be readable, instead of reflective. Sizing cards not bigger than 20 cm, because it should be cards not a 'book'. Cards should be attached on a keycord for around the neck or wrist, easy to carry around and have free hands. The rings and the keycords should be as light as possible, because the toolkit could get quite heavy hanging around your neck, after a while. The drawing pad should come in a package with a hard under-board surface, the paper sheets and a pen. The toolkit must not provide too many instructive words per part, or it could get boring or intimidating. Figure 98 shows some inspiration for the overal look and materials for the toolkit.

Design take-aways Toolkit as a whole:
• The toolkit could provide colourful, simple, minimalist, high in contrast cards.
• The toolkit must not weight too much to carry around their neck (cards + materials + rings + keycord).
• The toolkit could provide a keycords to carry the cards around neck and have free hands.
• The toolkit must not provide too many instructions per part, or it could get boring or intimidating.

Some insights found during prototyping were similar to insights from literature and field research, these were left out. Only design take-aways, different from literature and field research are shown. A summary of all design take-aways from ideation and prototyping can be found in Appendix 17.
6.3 Design requirements V2.0

The full list of “Design requirements V2.0”, can be found in Appendix 18. This paragraph only shows all changes made compared to “Design Requirements V1.0”. These changes were based on the design take-aways that were found in the design phase, phase 2. Some requirements were supplemented, others were added.

**Requirements that supplemented existing requirements:**

Equal experience (requirement number 20):
- The toolkit must ask questions (written on the cards) to both the sighted and visually impaired user to be equally important (providing a choice to both). For example: “Decide together what detail needs to be described”, instead of: “describe an important detail.”
- The toolkit must be inclusive in its design for both to be able to interact in an equal way. Cards that are inviting to interact with for both, either by touch or vision (an inclusive, design for vision and touch, with colour and shape).

Panofsky’s principles (requirement number 26):
- The toolkit must provide a specific order for the users to explore: (1.) Gathering visual information/observing (looking for the sighted and listening for the visually impaired companion), then (2.) Applying meaning to it by discussing and exchanging thoughts, and finally (3.) Interpret and reflect by choosing to get the ‘actual information’ provided by the museum. Connecting and comparing to “the right” answers (with the app).

Joint execution (requirement number 28):
- The toolkit must provide and stimulate active
participation to include both. Example: The sighted companion with drawing or describing the artwork and the visually impaired with touching materials and asking questions.

- The toolkit must be read out loud by the sighted companion, to involve the visually impaired companion.
- The toolkit must make sighted and visually impaired users work together, provide task that stimulate teamwork, in order to achieve deeper understanding of the artwork.

**Added requirements (new more specific requirements per component):**

**The toolkit as a whole (order, flow, layout):**

47. The toolkit must not include too many instructive words per part, or it could get boring or intimidating. It must be effective and straight forward.

48. The toolkit must not weigh much to carry around their neck (cards + materials + rings + keycord).

49. The toolkit should give a reason to come back to the same exhibition, but still give a different experience (each time it could be used differently, in a different order or in a different setting, therefore it is experienced differently each time).

**Layout toolkit cards:**

50. The design must consist of fun and playfully shaped cards, that look and feel attractive and inviting.

51. The toolkit must provide simple and minimalistic to easily interpret the content on the cards.

52. The toolkit must provide a keycord to carry the cards around the neck and have free hands.

**Part: Image description:**

53. The toolkit must give clear instructions and guidance
to sighted companions on how to describe an image literally and objectively (without own interpretations and/or emotions), in order for the visually impaired person to follow and have room for their own imagination.

54. The toolkit must provide questions that are easy to interpret and to answer, providing simple short questions or tasks, questions with answer suggestions or multiple choice. Example: What kind of artwork is it? Painting, Drawing, Photo, Print, Collage, … .

**Part: Tactile drawing:**

55. The toolkit must let visitors make tactile drawings themselves, to be flexible and independent.

56. The toolkit must provide a clear guidance and explanation to the user on how to draw the artwork to make drawing of shapes, composition or details easier.

57. The toolkit must provide guidelines and examples to the person who is drawing on how to use the drawing materials to make a ‘readable’ suitable drawing on the tactile paper.

58. The toolkit must provide drawing as an optional task, not a must.

59. The toolkit must encourage sighted users to explain and guide the visually impaired user with verbal explanation while touching the tactile drawing they made.

60. The toolkit must encourage to draw with one line, not too detailed, simple and draw not too close to each other.

61. The toolkit must provide a drawing pad that is easy to carry around (hang around the shoulder or put inside a bag) and have free hands to use other parts of the toolkit as well.

62. The toolkit must provide a drawing pad with a hard drawing surface and an integrated place for the tactile drawing sheets and pen.
63. The toolkit should include tactile drawing paper not smaller than A4 size.

**Part: Touching Materials:**
64. The toolkit must include at least 15 material swatches of materials that differ in touch.
65. The toolkit must include examples on how to use the material swatches.
66. The toolkit should make the visually impaired person in ‘charge’ of the material swatches part (for example: giving each companion to wear specific keycords. Like, the image description part is for the sighted and the material swatches for the visually impaired).

**Part: Mimicking / Enacting:**
67. The toolkit must give clear instructions on how users can mimic a painting, in order to give them more confidence.
68. The toolkit must provide more exploration possibilities besides mimicking artworks to choose from, since not everyone is comfortable doing it right away.
69. The toolkit must provide inspiration on how to enact / mimic. The guidelines must give inspiring tasks like “Put your companion in position of a person”, “Use hands to mimic an object”.

**Part: Critical questioning:**
70. The toolkit must provide example-questions to ask each other, to get inspired in that way of thinking.

**Part: App (optional)**
71. The toolkit should provide an alternative for the question-cards, by providing them on the app as well, to make a totally blind person be in charge of this part as well.
Figure 99: The toolkit
7. Final concept design: Eye can(t) see art
7.1 The toolkit

The final concept design is the “Eye can(t) see art” toolkit. This is the last version of the concept within my graduation project. The toolkit was tested and designed in Dutch (see Appendix 25 for the Dutch version), but in this thesis an English version is presented.

7.1.1 What is it?
“Eye can(t) see art” is a toolkit that consist of playful and interactive tools and guidelines that assist visually impaired and sighted people together, to explore artworks in a museum.

This toolkit can be used independent of museum tours or programs. It is flexible and mobile to use at any time, any museum and for any artwork.

The tools within the toolkit are both for sighted and visually impaired museum visitors to use while standing in front of an artwork. The toolkit provides instructive guidelines that guide the users (step by step).

By carefully following and executing the guidelines (step by step, how the cards are numbered and presented), the toolkit provides sighted and visually impaired museum visitors with an equal experience, interesting information and exploration possibilities for both. Once the cards are used more and the users are more comfortable to play around with them, they are free to use them however they think is helpful.

The toolkit consist of three layers (the order in which it is used), consisting of different components.
Figure 100: Layers in which the toolkit is used to be able to analyse an artwork.

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7.1.2 Toolkit components
The ‘Eye can(t) see art’-toolkit comes in a bag to easily transfer the tools to the museum.

Figure 101: A sketch of all toolkit components.

Figure 102: The toolkit used in the museum.
The toolkit consist of:
1. A manual with instructions
2. Image description cards (with guidelines step by step) on a keycord
3. Drawing cards (with guidelines step by step) on a keycord & a drawing-pad with tactile paper and a pen
4. Feel cards (with guidelines step by step) & material/ fabric swatches on a keycord
5. Enacting cards (with guidelines step by step) on a keycord
6. Question cards (with guidelines step by step) and questions to answer on a keycord
7. The application for smartphones (including audio instructions, and an option to get background information of an artwork)

See appendix 14 for the complete toolkit in English and Appendix 25 for the complete toolkit in Dutch.

The bag/packaging:

Figure 103: A drawing of how I envision the bag/packaging.
CAN'T SEE ART

A toolkit to help explore art together at museums. For sighted and visually impaired art lovers.

Download the app for more.
1. A manual with instructions.
The manual comes as a booklet, which should be read before going to the museum. It explains the goal of the toolkit, gives instructions on how to use it and provides the user with ground rules to remember. Also, the QR-code to download the app is provided, that can be scanned with a smartphone for direct download. In the app the toolkit cards can be found as well (to be used with audio description) and an instructive audio explaining what to do as well. The manual has a front cover, an index page, 3 pages with explanation (goal, components, instructions) and a back cover with QR-code.

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**GOAL**

This toolkit serves as a tool for sighted and visually impaired museum visitors, to experience art in museums together.

By carefully following and executing the steps on the square green cards, the sighted visitor can objectively convey works of art to the visually impaired visitor.

The visually impaired visitor can experience the artwork in an equivalent way, without interpretations of the sighted visitor.

The aim is to then be able to speculate, fantasize, discuss and interpret the artwork together on an equal level.

**COMPONENTS**

5 x set of cards, each with a different theme. A drawing pad, tactile paper and a pen.

---

**HOW DOES IT WORK?**

**STEP 1:**
PICK AN ARTWORK.
START WITH THE GREEN CARDS OF THE THEME “DESCRIBE”.

**STEP 2:**

**OPTION 1:** ENOUGH OF THIS ARTWORK? CHOOSE ANOTHER ARTWORK AND START OVER WITH THE DESCRIPTION CARDS.

**OPTION 2:** WANT TO DISCOVER MORE IN THIS ARTWORK? CHOOSE ANOTHER SET OF CARDS TO DIVE DEEPER.

**STEP 3: OPTIONAL**

SCAN THE ARTWORK WITH THE APP AND DISCOVER BACKGROUND INFORMATION FROM THE MUSEUM ON THE ARTWORK.

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Figure 104: Two pages from the manual.
2. Image description cards on a keycord

![Image of description cards on a keycord]

*Figure 105: The description cards with guidelines on a keycord (picture of the Dutch version).*

The square green cards are for image description (describing of the artwork). Including guidelines for the sighted companion to follow.

These cards are the starting point of the exploration of the artwork, always. By carefully following and executing the guidelines on these cards, the sighted visitor can objectively convey works of art to the visually impaired visitor. This way the visually impaired visitor can experience the artwork in an equivalent way, without interpretations or emotional responses of the sighted visitor.
Cover-card:

**DESCRIBE**
**READ THE CARDS OUT LOUD**

These square green cards provide simple instructions for the sighted visitor to objectively describe the artwork to the visually impaired visitor.

*Figure 106: The front and backside of the description cover-card.*

This card shows the theme of the cards and explains briefly what this cardset consists of.

The start-card:

**START**

1. Choose a work of art.
2. Read the following ground rules carefully to be able to describe objectively.
   - Look closely.
   - Stick to facts.
   - Describe without emotion.
   - Avoid own interpretations.

Go to card 1 to start describing.

*Figure 107: The front and backside of the description start-card.*

First of all, clarity is needed for the person who will describe. Since it is important to describe the artwork objectively and with sufficient information this card is important to remind the sighted person with some ground rules. This card gives clear instructions on what the sighted
person should pay attention to when describing, saying:

- Look closely.
- Stick to facts.
- Describe without emotion.
- Avoid your own interpretations.

Card 1: First impression

1. FIRST IMPRESSION
   1. I see a... (painting, photograph, drawing, print).
   2. The artwork is:
      - Landscape oriented
      - Portrait oriented
      - Other
   3. In the artwork, I see... (Describe in one sentence what is literally shown in the artwork. Stick to facts.)
   4. The artwork is:
      - Figurative (I see recognizable figures)
      - Abstract (I see unrecognizable shapes)
   5. Is the artwork rich in contrast? Yes / No
   6. Two clearly present colours are...
      - Yes. Go to card 2.
      - No. Start over with another work of art.

Figure 108: The front and backside of the first step card: ‘First impression of the artwork’.

Then, the first card starts when they stand in front of an artwork, together. This card helps to get a first impression of the artwork. It is important to be able to get a first impression of the work, both for the sighted and the visually impaired person. The first impression card guides them to get a first glimpse of the work of art to then choose together which works of art to then explore further. The aim is to provide the same information to the visually impaired person, which sighted people would immediately obtain when looking at a work of art. These guidelines for the first impression are therefore short in order to quickly form a first impression and impression. The first impression guidelines contain questions to be answered by the sighted person, in which he or she describes: What type of
artwork it is; what format and shape the artwork has; in one sentence what can be seen in the artwork; what the main colours of the artwork are, and; whether the artwork is rich in contrast. When the first impression is clear, the sighted and visually impaired people can decide together whether they want to delve deeper into this work. If so, then they proceed to the next card.

Card 2: Composition

The second step “composition” helps to chronologically describe the composition of the artwork. The sighted person is given the choice to describe from top down, left to right, front to back, from the center outwards or clockwise. He or she chooses an appropriate logical structure to describe where persons, objects or figures can be seen. They are again pointer out to describe what can literally be seen in the work.

Note: It was important to constantly remind the sighted companion that the description should literally be described without emotion or interpretation. The guidelines of the toolkit therefore repeat this constantly.
Card 3: Events

3. EVENTS
1. Choose one event in the artwork together and answer the following questions: (Describe literally. Avoid own interpretations.)
   a. What effect do the objects, figures and/or persons have on each other?
   b. What size do the objects, figures or persons have in relation to each other?

Tip: Repeat step 1 for other events in the artwork.

Go to card 4 to continue.

Figure 110: The front and backside of the third step card: ‘Composition of the artwork’.

As a third step, “events” means that the sighted person describes what is literally going on between the objects, figures and persons. The sighted companion describes what their relations are, what effect they have on each other and/or what size they have compared to each other.

Card 4: Colours

4. COLOURS
1. Do you want to talk about the colours in the artwork?
   - Yes. Go to step 2.
   - No. Go to card 5.

2. Together choose one object, figure or person from the artwork and describe what colors this object, figure or person has. (Connect colours with natural elements for clarification, such as: lemon yellow, egg yolk, or grass green.)

Tip: Repeat step 2 for other objects, figures or persons in the artwork.

Ga naar kaart 5 om verder te gaan.

Figure 111: The front and backside of the fourth step card: ‘Colours in the artwork’.

The fourth step involves describing colours. It is important
that they are asked whether they need this. A person born blind may prefer not to discuss colours, or rather keep them short. If they do choose to continue describing colours, some tips are given on how to do this. For example by linking colours to natural elements, such as lemon yellow, egg yolk or grass green.

Card 5: Technique

5. Technique

1. What kind of artwork is it?
   Painting, Drawing, Photo, Print, Collage, ...

2. What material was used?
   Canvas, Paper, Glass, Fabric, Wood, ...

3. Which techniques have been used?
   Paint, Pencil, Chalk, Ink, Combination, ...

4. What textures does the artwork have?
   Rough, Smooth, Soft, Hard, Silky, ...

Go to card 6 to continue.

Figure 112: The front and backside of the fifth step card: ‘Techniques used for the artwork’.

The fifth part of the description concerns the technique of the artwork used by the artist.

Here, the sighted companion is asked:

- What kind of artwork it is (Painting, Drawing, Photo, Print, Collage, ...);
- What material is used (Cloth, Paper, Glass, Fabric, Wood, ...);
- Which techniques have been used (Paint, Pencil, Chalk, Ink, Combination, ...);
- What textures does the artwork have? (Rough, Smooth, Soft, Hard, Silky, ..).
Card 6: Details

6. DETAILS

1. Together choose **one** detail of an object, figure or person from the artwork together to elaborate further. (Avoid emotions. Describe what you literally see.)

If necessary, move closer to the artwork and describe the detail.

**Tip:** Repeat step 1 for other details. Note that not all details are important.

Go to card 7 to continue.

Figure 113: The front and backside of the sixth step card: ‘Details in the artwork’.

The sixth step is about “details” in the artwork. It is important that the sighted person understands that not all details are equally important to describe. Therefore, the choice is also for the visually impaired visitor, what detail he or she wants more information about.

Card 7: Choice card

7. CHOICE CARD

READ OUT LOUD

You have now finished describing.

Do you want to discover more in this artwork?

- Yes. Choose a different set of cards.

- No. Choose a new artwork and start at card 1 from describing.

Figure 114: The front and backside of the seventh step card: ‘Choice card’ to choose what their next step will be.
Finally, ‘description’ ends with a choice card. They are asked whether they want to find out more in this artwork. If they choose to stick with this artwork, they can use one of the other cards to speculate, fantasize and exchange thoughts together. If not, they can go to a new artwork and start over with the description cards.

3. Drawing cards on a keycord & a drawing-pad with tactile paper and a pen

![Image of drawing cards]

Figure 115: The drawing cards with guidelines on a keycord (picture of the Dutch version).

The rectangular blue cards are for making tactile drawings of the artwork. Including guidelines for the sighted and visually impaired user.
Cover-card:

**DRAWING**
**READ OUT LOUD**

These blue rectangular cards provide easy drawing instructions. Drawing can help you to translate the artwork into a tactile drawing.

*Figure 116: The front and backside of the cover card from the drawing guidelines.*

This card shows the theme of the cards and explains briefly what this card set consists of.

The start-card:

**START**
**READ OUT LOUD**

1. Read the tips below carefully.
   - Use the whole sheet.
   - Draw firm with the pen on the sheet.
   - Draw in a few lines.
   - Keep the drawing simple.
   - Not every detail is important.
   - Think out loud while drawing.

Go to card 1 to start drawing.

*Figure 117: The front and backside of the drawing start-card.*

Again, clarity is needed for the person who will draw. This card gives some tips and instructions to keep in mind, to
make a clear tactile drawing. The tips and for some the motivation behind it, are put down below.

- “Use the whole sheet”: because a big a more spacious drawing is more likely to be understood.
- “Draw firm with the pen on the sheet”: pressure with a pen is needed to create a raised line on the special sheet.
- “Draw in a few lines”

- “Keep the drawing simple”
- “Not every detail is important”.
- “Think out loud while drawing”: this needs to be done to include each other while drawing. Also, it helps to communicate about what the sighted person is drawing and what their visually impaired companion will feel.

The last sentence on the card says to go to card 1, to start drawing.

Card 1: Drawing options

1. DRAWING OPTIONS
READ OUT LOUD

1. Choose what you want to draw together.
Choose one of the following options.
- Composition in the artwork.
  Go to card 2.
- A chosen shape (object, figure or person) from the artwork.
  Go to card 3.
- Own interpretations of the artwork.
  Go to card 4.

Figure 118: The front and backside of the first step card: ‘Drawing options’: where they can choose what to draw (leading them to card 2, 3 or 4).
This cards provides options to the visitors, to choose what they want to draw. Both are asked to discuss whether they want to draw the composition, a shape of an object, figure or person, or their own interpretation of the artwork. Each choice leads them to another card, referred to with a number.

Card 2: Composition

Instructions for the sighted visitor:
Grab the drawing pad, a drawing sheet and a pen.
- Use the whole sheet.
- Draw firm with the pen on the sheet.
- Draw in a few lines.
- Think out loud.

1. Draw the frame of the artwork, as large as possible, on the sheet. For example: rectangle, square, round.

2. Determine the locations of the persons, objects and / or figures. Place them clearly in the frame as simplified line drawings.

3. Let the other person feel the tactile drawing and explain what he or she feels.

Go to card 5 to continue.

Figure 119: The front and backside of the option card number 2: instructions who to draw the ‘Composition of the artwork’, .

This card is for the sighted companion. It explains how to draw the composition of the artworks in easy steps, only using lines.

Here again, the ground rules are stated, since they are important and people tend to forget them. This card also has example cards attached to it, to help, inspire and give an example of what such a line drawing looks like.
Example card for composition:

![Example card for composition](image)

*Figure 120: The front and backside of an example card, with an example drawing how to draw a suitable line drawing of the composition.*

Card 3: Chose shape

![Card 3: Chose shape](image)

*Figure 121: The front and backside of the option card number 3: instructions on how to draw shapes of characters in the artwork.*

Another option to draw is a(n) object, figure or person from the artwork. Both decide which character the sighted person gets to draw, either to convey a shape, explain detail or make a movement clear.

Again, example cards are attached to show how a suitable
line drawing can communicate information of shapes and details.

**Example cards for shapes**

*Figure 122: The front and backside of an example card, with an example drawing how to draw a suitable line drawing of a shape.*

*Figure 123: The front and backside of an example card, with an example drawing how to draw a suitable line drawing of a shape.*
Card 4: Own interpretation

4. OWN INTERPRETATION
READ OUT LOUD

Tip: take a seat somewhere.

Grab the drawing pad, a drawing sheet and a pen.
- Use the whole sheet.
- Draw firm with the pen on the sheet.
- Draw in a few lines.
- Think out loud.

1. Decide together who is going to draw. Decide what to draw. Could be anything related.

2. Let the other person feel or see your masterpiece. If necessary, ask each other questions.

Go to card 5 to continue.

Figure 124: The front and backside of the option card number 4: Instructions and inspiration to draw an interpretation of the artwork.

This card helps as inspiration, either for the sighted or visually impaired companion. At first the guidelines tell them to take a seat somewhere. Then, they can draw either what they want to make clear to each other, their own interpretation of the artwork, or anything that helps to communicate what that specific artwork evokes in them.

Card 5: Choice card

5. CHOICE CARD
READ OUT LOUD

You have now finished drawing.

1. Do you want to discover more in this artwork?
   - Yes. Choose a different set of cards.

   1. Do you want to try a different artwork?
      - No. Choose a new artwork and start with card 1 from describing.

Figure 125: The front and backside of the last step: ‘Choice card’.
This card is again a choice card. The users are led to this card whenever they are done with drawing, to be able to choose to go to another artwork or dive even deeper into this artwork by using another set of card.

**The drawing pad:**

![Image of a drawing pad](image)

*Figure 126: The drawing pad with a hard frame, rubber and special sheets for tactile drawing.*

The drawing pad (A4 size) with rubber and a drawing sheet clipped under the frame. The pen is attached to the drawing board on the back side.
4. Feel cards & material swatches on a keycord

Figure 127: The feel cards with guidelines on a keycord (picture of the Dutch version).

Figure 128: The different material swatches.

The triangular dark yellow cards, together with the material swatches can help to make the artwork tangible. Guidelines on the cards give examples how to use the material swatches. The material swatches are of different textured fabrics.
Cover-card:

Figure 129: The front and backside of the cover card from the ‘feel’ cards.

The cover card says: “Feel”. This is the first card users see when they choose this set of cards.

The start-card:

Figure 130: The front and backside of the ‘feel’ start-card.

The start card gives options on how to use the “feel” cards. They can choose to go to card 1: “Speculate”, card 2: “In mind”, or neither and just start using the material swatches however they like.
Card 1: Speculate

1. SPECULATE

1. Choose one object, figure or person from the artwork.

2. Both close your eyes and feel the materials cards. Discuss how you think the object, figure or person (for example, the clothes) would feel.

Go to card 3 to continue.

Figure 131: The front and backside of the first option card from the ‘feel’ cards: ‘Speculate’.

This card asks the users to choose an object, figure or person from the artwork, then to close their eyes and both touch and feel the material swatches. Then, they are asked to discuss what materials they think fit the chosen character and why.

Card 2: In mind

2. IN MIND

1. Choose one object, figure or person from the artwork.

2. Feel the material cards. Think silently how you think the object, figure or person (for example clothing) would feel. And compare.

Go to card 3 to continue.

Figure 132: The front and backside of the second option card from the ‘feel’ cards: ‘In mind’.

The option “in mind”, asks the users to silently think of a
material that fits the chosen object, figure or person. Then if they both found something they think belongs to it, they can tell each other, compare and argue why they had the same or a different one in mind.

**Card 2: Choice card**

1. Choose one object, figure or person from the artwork.

2. Feel the material cards. Think silently how you think the object, figure or person (for example clothing) would feel. And compare.

---

*Figure 133: The front and backside of the last card from the ‘feel’ cards: ‘choice card’.*

This card is again a choice card. Used the same as for the other cards, providing an option on either to proceed or to go to another artwork.
5. Mimicking/enacting cards on a keycord

![Image of cards on a keycord with text in Dutch]

Figure 134: The mimic cards with guidelines on a keycord (picture of the Dutch version).

Cover-card:

![Image of the front and backside of a cover card]

Figure 135: The front and backside of the ‘mimic an artwork’ cover card.

This card shows the theme of the card set, with a brief explanation.
The Start-card:

Figure 136: The front and backside of the ‘mimic an artwork’ start-card.

The start card gives options on how to use the “mimic” cards. They can choose to go to card 1: “Put in position”, card 2: “Mimic”, or neither and just start however they want to enact the artwork.

Card 1: Put in position

Figure 137: The front and backside of the first option card: ‘Put in position’.

This card asks the users to choose an object, figure or person from the artwork, then for one of them to put the other in the position of that character and discuss the effect of the position.
**Card 2: Mimic**

2. **MIMIC**
READ OUT LOUD

1. Choose one object, figure or person from the artwork to mimic.
2. Let the other person feel your position, posture or hands.
   **Tip:** You can also only your hands to form shapes.

   Go to card 3 to continue.

*Figure 138: The front and backside of the second option card: ‘Mimic’.*

This card gives guidelines on how to mimic an object, figure or person from the artwork. The card also suggests another way to mimic an object, by using their hands.

**Card 3: Choice card**

3. **CHOICE CARD**
Do you want to discover more in this artwork?

- Yes, Choose a different set of cards.
- No, Choose a new artwork and start with card 1 from describing.

*Figure 139: The front and backside of the last card: ‘Choice card’*

This choice card provides an option on either to proceed to explore within this artwork with another set of cards or to go to another artwork.
6. Question cards on a keycord

Figure 140: The question cards with guidelines on a keycord and the question option in the app (picture of the Dutch version).

The round red “question” cards help and inspire to ask each other questions about their personal connection, their thoughts and emotions with the artwork.

Cover-card:

Figure 141: The front and backside of the ‘questions’ cover-card.

The cover-card says: “Questions“. This is the first card users see when they choose this set of cards.
The start-card:

**START**
READ OUT LOUD

1. Decide together who will ask the questions. And choose an option:

- When you are unable to read these cards.  
  Go to the app and press on the “ask button”.
- When you are able to read these cards.  
  Go to card 1.

*Figure 142: The front and backside of the ‘questions’ start-card.*

The start card gives two options, on how to use the “Question” theme. The cards suggest to use the app, for people that are not able to read the cards (e.g. legally and totally blind companions) or to use the cards when they can read the cards.

**Card 1: Questions**

**1. QUESTIONS**
READ OUT LOUD

Use the round questionmark cards to ask each other questions.

**Tip:** Pick a card randomly, let the cards surprise you.

Go to card 2 when you are done with asking questions.

*Figure 143: The front and backside of the first step for ‘questions’.*

This card asks the users to randomly select a question card and ask each other the question written on the card.
Questionmark cards:

In total there are 22 ‘questionmark’ cards. Users can also use the cards as inspiration to help come up with other questions to ask each other. Some of the question cards are shown below. For all the question cards, see Appendix 24.

![Questionmark card example](image)

*Figure 144: The front and backside of a questionmark card.*

![Questionmark card example](image)

*Figure 145: Two other examples of a question markt card (only front side).*
2. Choice card:

Do you want to discover more in this artwork?
- Yes, choose a different set of cards.
- No, choose a new artwork and start with card 1 from describing.

Figure 146: The front and backside of the last step for ‘questions’: A choice card.

With this choice card users can choose to use another card for the same artwork or go to another artwork and start over with the “describing” cards.

7. The application for smartphone

Figure 147 to 149: Some screens from the app.
The application includes:
• An audio instruction.
• The content of the cards for audio description.
• The alternative button for the question cards.
• The scanning tool to scan the artwork and get additional background information about the artwork.

For the application, a suggestion is made. During the final user test the app was tested, low fidelity style, where I played the part of the app, see paragraph 8.1 for further explanation.

To make an easy to use app the “Be my eyes” app was used as inspiration. The screens of the app (proposal) are shown on pages 142 and 143.

**Audio instructions in the app**
The audio instructions in the app can be found when ticking on the instructions button, see figure 151.

Then, the user hears the instructions (which I recorded). The message is as follows:

“Hi and welcome to the instructions of the ‘Eye can(t) see art’ toolkit. This toolkit can help you go to any museum together and experience art in an equal way.

By accurately following the steps on the cards and carefully performing them, you will be able to converse or discuss the artworks in an equivalent way.

It is important that you follow the steps precisely to get to know the toolkit. Especially the first few times.
The game always starts with the square green cards where the sighted visitor explains to the visually impaired visitor what he or she literally sees.

Be aware: Describing should be as factual as possible. An example of this is: “In the painting I see a man with a smile on his face” instead of “I see a happy man”. OR “In the photo I see 4 boys sitting on a bench, from left to right”, instead of: “in the photo, I see a bunch of young people doing nothing.” So avoid your own interpretations. Stick to facts.

Once the steps on the green cards have been completed, it’s time to speculate and fantasize about the artwork together. You can use the other cards for this: The blue rectangular cards for drawing, which allows you both to make a tactile drawing of the artwork; The yellow triangular cards for feeling, with material swatches of fabrics, that can help you make the artwork tangible; The red round cards for inspiration to ask critical and personal questions to each other; and the hexagonal pink cards to mimic and enact figures, objects or persons. The important thing here is to involve each other. Do it together.

When you have finished discovering an artwork, you can also use the app to get extra background information about the artwork. Scan the artwork and listen to the story of the artwork or artist.

Trust the process, as you learn along the way to get the most out of your museum visit. Have fun and enjoy your art experience with the toolkit!”
The app screens

Figure 150: ‘Start up’-screen.

Figure 151: Home screen: Menu.

Figure 152: The toolkit digital

Figure 156: Scanning an artwork.

Figure 157 & 158: Explanation audio and text (after scanning) about the artwork.
Figure 153: Instructions menu.

Figure 154: Instructions audio.

Figure 155: Settings menu.

Figure 159: The question cards, digital.
7.1.3 How does it work?

1. William has cataract and want to visit a museum independently with his daughter Ivy. Therefore, they buy the ‘Eye can(t) see art’ toolkit online.

2. When they receive the package, a few days later, they unpack it together.

3. Ivy opens the box and start to read the manual.

4. On the backside of the manual, she finds a QR-code to download the app.

5. They then listen to further instructions in the app. They learn how they can use the toolkit and app in the museum.

6. They further unpack all the tools from the box and explore what the toolkit consists of. William is able to see shapes and contrast of the cards.
7. The next day, they go to the Chabot Museum in Rotterdam. They bring the toolkit along with them.

8. Once inside of the museum, they hang the tools around their necks.

9. William and Ivy approach the first artwork. ‘Brand van Rotterdam’ by Henk Chabot.

10. Ivy takes the first card set to start: ‘The description cards’. These cards help Ivy to describe the painting objectively.

11. Ivy starts with the first step, which allows her to describe the painting in short. This way they both get a first impression.

12. Ivy continues with the other steps, since they decided together to explore more in this painting. William listens, gathering the visual information.
13. William then takes the question cards. The fontsize allows him to read the questions. This card says: “What title would you give this artwork?”

14. They continue with more questions. Taking random cards of the keycord.

15. They decide to scan the artwork with the app, to find out more about the painting.

16. They listen to the background information and reflect on their own findings.

17. They move on to a next painting of choice.

18. Ivy, again, starts to describe according to the guidelines on the green cards. William listens and builds the image in his mind.
19. After the artwork description, they choose the drawing cards. William wants to know more about the shape of the horse in the painting.

20. Ivy reads the drawing cards out loud. This allows them both to choose between the different options.

21. They decide Ivy will draw the composition of the painting. She grabs the tactile drawing pad.

22. She starts with the frame of the painting. Then, she starts to draw the horse in simple lines only. She talks out loud, while drawing.

23. While William feels the tactile drawing, Ivy explains.

24. They talk about what the painting adds to the image William already had. Ivy is proud of what she has drawn.
25. They continue exploring with the toolkit with other paintings. These cards help them to mimic the painting.

26. Ivy puts her father in the position of the man in the painting. Together they talk about the effect of the position.

27. They approach more paintings with the other cards. This time they choose the feeling cards to talk about materials in the painting.

28. They discuss what fabric the clothing of the man in the painting is like.

29. They also use the material swatches to discuss emotion and colours of the painting.

30. William and Ivy are satisfied with their museum experience and their many discoveries. They leave happily, sharing a vivid memory together.
7.2 Value of the toolkit

The toolkit helps visually impaired people to explore art together with their sighted companion on an equal level, at any time at any museum for any type of artwork.

The toolkit provides exploration opportunities for different people with different visual impairments. The toolkit makes an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs. Visitors can bring the card set to the museum, any time and anywhere.

Furthermore, it helps people to interact socially and helps to start dialogue and conversations about artworks. The toolkit makes it possible to exchange thoughts between sighted and visually impaired museum visitors in an equal and balanced way. Visually impaired people can be equal to their companion, friend or family member during their museum visit. Also, the tools help visually impaired and sighted visitors to get equally interesting information. Creating an equal experience to both people, when exploring the artwork. The cards guide users step by step. At the same time, the toolkit is designed in such a way that interaction between sighted and visually impaired visitors leaves room for own imagination and interpretation about the artwork.

The toolkit needs to be used together, in a socially interactive way. Visually impaired people and sighted people can enjoy a joint execution; the toolkit provides multiple different tools that stimulate teamwork. This way they get more out of their visit. The tools provide playful educative interactions, because it requires effort from the users and rewards them with enjoyable skill improvement
on how to explore artwork together. The toolkit provides tools to “play” with, making the users feel stimulated, challenged, curious or proud. Also, the design provides informative and interesting exploration options for all different impairs and sighted (describing, drawing, enacting, talking, touching). The tools include sensory experiences. Auditory and tactile exploration experiences are combined. The cards provide guidelines, information and guidance on how to explore and learn new things together, during a museum visit.

This toolkit provides its users with a choice of freedom on what type and which artworks to explore, it can be used everywhere (at any museum of choice). The design of the toolkit is feasible within the museum context and within the graduation project.

**Evaluating the toolkit**
Before testing the final toolkit was once evaluated according to the design goal and the vital design requirements.

The design goal and the vital design requirements are put in a table opposite to each other. Each component of the toolkit is then explained why it fits the requirement.

The design goal was:

“To design a tool that assists visually impaired museum visitors and their sighted companion, to explore 2D artworks of choice, in an equally balanced, rich explorative and playful way, during an independent museum visit.”

The next pages shows the table referring to the DG. A bigger size of this table can be found in Appendix 19.
<table>
<thead>
<tr>
<th>1. Image description</th>
<th>Independent museum visit</th>
<th>Social interaction (together)</th>
<th>Equal experience (balance sighted and visually impaired)</th>
</tr>
</thead>
<tbody>
<tr>
<td>the image description is free in its use, whether they take 2 minutes or an hour, depending on the needs of the users. Also, options and choices are provided, for example if they would like to describe colours or not, since for some visually impaired people colour is no added value.</td>
<td>image description can be used independent from museum agenda, programs, selections or employees. Sighted and visually impaired companions are in charge what artwork to describe and when.</td>
<td>dialogue through talking by the sighted companion, and listening by the visually impaired companion. Also conversations follow this, from questions from the visually impaired that the sighted person answers.</td>
<td>the visually impaired companion gives an objective description, which makes it possible for the visually impaired person to be on an equal level of perceiving information of the artwork rather than getting an emotional and subjective explanation, where the sighted person is dominant. Also, both are asked questions to help balance out tasks and decision making. Examples are: “We you both like the painting and want to continue with this painting?”, “What part of the artwork do you both want to describe?”</td>
</tr>
<tr>
<td>2. Tactile drawing</td>
<td>making tactile drawings can be done anywhere and any time, as long as they have the drawing materials.</td>
<td>verbal explanation by the sighted while the visually impaired touches the drawing. It starts conversation easily, asking each other questions and making things clear. Drawing starts conversation about emotions and it provides opportunity to exchange each others’ perspectives.</td>
<td>the sighted person gets a closer more detailed look at the artwork while they draw, since they need to pay attention to what and how they draw. The visually impaired person gets to choose what the sighted companion draws and then gets to feel the drawing and a verbal explanation, and gets to ask questions about it.</td>
</tr>
<tr>
<td>3. Touching materials</td>
<td>the material swatches are accessible by using hands.</td>
<td>speculation about materials can be done at any time as long as they have the material swatches.</td>
<td>both are speculating about what they feel and how this can relate to the artwork. Different excercises are provided as inspiration, they both could close their eyes for example, exchanging thoughts about the materials.</td>
</tr>
<tr>
<td>4. Mimicking / Enacting</td>
<td>mimicking the artwork can also be done by any person, maybe some feel uncomfortable. Then, still they are able to touch postures or hand gestures of their companion.</td>
<td>mimicking can be done any time (with the guidelines), without any further help needed from the museum.</td>
<td>both are asked to move, enact and form a shape, figure, object or posture. Either the sighted person stands in a position or puts the visually impaired person in a position, or the other way around.</td>
</tr>
<tr>
<td>5. Asking critical questions</td>
<td>asking questions is also for everyone.</td>
<td>conversation about shapes, figures and postures, as well as body sensations and emotions.</td>
<td>the visually impaired person can use the app (pressing on a button which then provide a random question) or, when he or she still has remaining sight use the cards to ask a question of choice. The sighted companion also can use the cards to ask a question of choice. Questions are about own imagination, interpretation and perspective so can be answered by both (because they both got information on what the artwork looks like after image description).</td>
</tr>
<tr>
<td>6. Toolkit as a whole</td>
<td>the toolkit provides many options that probably will fit different people (different age, gender, type of impairment).</td>
<td>exchanging knowledge, thoughts, imagination, perspective and interpretations by taking, drawing, touching, feeling, listening, enacting and asking.</td>
<td>the tools and guidelines provide different tasks and questions for both sighted and visually impaired users. Also, because the toolkit provides a specific order of: 1. gathering information (image description) 2. getting a deeper understanding (drawing, touching, enacting, questionings), 3. getting answers (using the app to get some background information).</td>
</tr>
</tbody>
</table>

**For different visual impairments (type/gender/age)**

Provides for different type of visual impairments, because...

**Independent museum visit**

Provides an independent museum visit, because...

**Social interaction (together)**

The social interaction as a resulted effect of this part is...

**Equal experience (balance sighted and visually impaired)**

Provides an equally balanced experience, because...
<table>
<thead>
<tr>
<th>1. Image description</th>
<th>Own imagination and interpretation</th>
<th>Joint execution (sighted and visually impaired)</th>
<th>Playful interaction</th>
<th>Informative and interesting for both (sighted and visually impaired)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provides room for own imagination and interpretation for both, because ...</td>
<td>Provides a joint execution (for sighted and visually impaired), because ...</td>
<td>Provides a playful interaction, because ...</td>
<td>Provides interesting information to create a deeper understanding for both (sighted and visually impaired), because ...</td>
</tr>
<tr>
<td></td>
<td>the sighted person is able to look closely and describe the painting objectively and the visually impaired person is able to create an image and to build own imagination on this description.</td>
<td>the sighted companion needs to look closely and follow the guidelines, the visually impaired needs to listen closely and both get asked questions to answer.</td>
<td>image description guidelines are brought as a more interactive game-like way. And, between the users a social interaction is created were they are both challenged to work together to create the image according to the guidelines (like playing an educative game together).</td>
<td>... the sighted companion looks differently, pays more attention and creates a better understanding by describing the artwork. ... the visually impaired person gets an objective clear explanation of the artwork to gather information to build the image and form own imagination.</td>
</tr>
</tbody>
</table>

| 2. Tactile drawing | drawing is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level. | the sighted companion draws and explains, the visually impaired companion traces the drawing by touch and asks. | drawing helps people to interactive in a creative way. The users provides information by making, creating and touching. Interactive use of the tool in a playful way, by using hands. Also drawing can make the a person proud, which is found an aspect of a playful interaction. | ... the sighted companion looks closer by drawing. For example to composition and details. He or she learns to look at the artwork in a different way, to really put the essence on paper and therefore gets a better understanding. ... the visually impaired person gets to choose what part he or she want to be translated into a line drawing. Then the tactile information about composition and shapes gives information and creates deeper understanding. |

| 3. Touching materials | touching is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level. | both touch the material swatches and discuss the materials and textures. | touching materials make the user feel stimulated and curious. | touching materials provides both sighted and visually impaired people a chance to get a deeper understanding of the sensation of materials and textures in the artwork. |

| 4. Mimicking / Enacting | mimicking is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level. | both mimic and feel each others posture or put each other in position. | moving the body and working together to achieve a joint goal (deeper understanding) is an enjoyable way of ‘learning’. | mimicking shapes and postures with the body can provide individuals with emotional, empathic response. Standing in a certain way can help feeling a certain way. Also, touching someone standing in a certain position can help to create deeper understanding about shapes and motion. |

| 5. Asking critical questions | questioning is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level. | both are asked and answer questions together. | emotional responses and social interaction are used in an enjoyable way to gather information. | asking critical questions to one another provides insights about each others perspective to then build upon, change or question their own idea. In this way a richer understanding of the artwork can be reached. |

<p>| 6. Toolkit as a whole | by carefully following and executing the steps of the image description guidelines, the sighted visitor can transfer works of art in an objective manner to the visually impaired visitor. The visually impaired visitor can experience the artwork in an equivalent way, without interpretations of the sighted visitor. The aim is to then be able to speculate, fantasize, discuss and interpret the artwork together in an equal balanced way with all the other tools provided. | The tools and guidelines provide different tasks and questions for both sighted and visually impaired users. | the layout of the toolkit is playful and colourful. The shaped cards feel and look inviting to &quot;play&quot; around with. Also, the drawing kit and the material-swatches are inviting to play with. The toolkit provides a playful interaction, because it requires effort from the users and rewards them with enjoyable skill improvement on how to explore artwork together. The toolkit provides tools to &quot;play&quot; with that make the users feel stimulated, challenged, curious, proud. | The toolkit provides visually impaired and sighted people with tools to help create a deeper, richer and diverse understanding. Providing new information for both to explore the artwork in new ways. |</p>
<table>
<thead>
<tr>
<th>1. Image description</th>
<th>Auditory together with tactile exploration (multi-sensory)</th>
<th>This aspect is an auditory or a tactile exploration of the artwork, because ..</th>
<th>Guidance (assisting tool)</th>
<th>Provides guidance by ..</th>
<th>Choice of freedom (any type artwork)</th>
<th>Provides a freedom in choice by ..</th>
<th>Feasible</th>
<th>Is it feasible?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>It provides verbal explanation about the artwork. This part helps to create a deeper understanding of what is in the artwork.</td>
<td>providing clear (step by step) instructions on how to describe an image.</td>
<td>providing a set of cards that is mobile to use and learn how to describe any type of artwork (providing image description guidelines).</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Tactile drawing</td>
<td>It provides a tactile representation of the artwork. This part helps to create understanding of composition, shapes and details.</td>
<td>providing clear (step by step) instructions and examples on how to draw a tactile drawing of an artwork.</td>
<td>providing a drawingpad (with silicone and tactile paper/pen) that can be used anywhere at any time, together with the guidelines to help create a tactile representation of any type of artwork. Not dependent on what the museum offers.</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Touching materials</td>
<td>It provides a tactile experience to relate to parts from the artwork. This part provides information on how objects, figures or people (clothes for example) might feel.</td>
<td>providing clear examples on how to use the material swatches to relate with the artwork.</td>
<td>providing material swatches, which can be used for every artwork and at any time, since they can be interpreted in many ways. Also, for each type of artwork they might have a different meaning.</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mimicking / Enacting</td>
<td>It provides a feeling / sensation in the body of the person enacting or it makes it possible to touch the body of the companion standing in a certain position. This part provides information about the shapes and emotions of the figures, objects and people in the artwork.</td>
<td>providing clear examples on how to use hands and body to enact parts of the artwork.</td>
<td>providing an option to enact / mimic a painting, which only needs users hands and body movement. Though it might be hard to use this for every type of art, the guidelines does provide examples to get creative and improvise.</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Asking critical questions</td>
<td>It provides a verbal form of getting a deeper understanding of each others interpretations and thoughts. Critical questions start discussion and conversation.</td>
<td>providing clear stated example questions to know what kind of questions to ask eachother.</td>
<td>providing an option to ask eachother questions, which can be done with any type of artwork. As long as users are inspired and triggered by the questions they can use it anywhere.</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Toolkit as a whole</td>
<td>the toolkit as a whole provides tactile and audio exploration options to create provide a rich exploration of the artwork.</td>
<td>providing clear manual to read beforehand and instructions throughout the toolkit (step by step), to know how to use the tools.</td>
<td>providing many options to make it possible to explore different types of artworks. After describing an image (step 1 of the toolkit), users have the choice to make a tactile drawing, ask eachother questions, mimic, touch materials/watches. For each artwork their should be a fitting exploration option, which makes the toolkit help users be free in their choice.</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Phase 3. Validation

This phase consists of two sections: the user test and the evaluation of the design.
8. User test

This chapter describes the user test, which was done to validate design requirements with the target audience. The primary goal of this test is to identify points of improvements within the design. Paragraphs 8.1 explains the approach: why, how and with whom (the participants) the ‘Eye can(t) see art’ toolkit was tested. Paragraph 8.2 presents the test-results.

8.1 Testing approach

This user test was done to evaluate my design with the target audience. Most importantly, I wanted to test whether the 12 star requirements were met. The 12 star requirements represent my design goal and interaction vision. Besides this main goal, I also wanted to identify usability problems and determine participants’ overall satisfaction.

8.1.1 Methods used

For the user test, the method ‘usability testing’ (Tomitsch, 2019, p.126 & 127) was used, because it allowed me to determine whether people understand how to use the toolkit.

Before conducting the test two main research questions were stated and assumptions were made. This was done to later be able to draw conclusions. The research questions asked were:

a. Does the toolkit design meet the design goal and interaction vision (meet the 12 star design requirements)?

b. Is the toolkit user friendly? If not, what problems occur when using the toolkit?

c. Does the toolkit meet an overall user satisfaction,
meaning if the users would use it, buy it or recommend it to a friend?

According to these research questions (based on the 12 star requirements, user friendliness and user satisfaction), I made a list of assumptions, to validate during the test. The assumptions were:

- The toolkits user instructions are easy to understand.
- The toolkit makes visually impaired and sighted users feel equal to each other.
- The toolkit assistsguides its users in approaching the artworks in a way that they would not be able to do without a tool.
- The toolkit provides users to collect a satisfactory level of understanding of the artworks by themselves.
- The toolkit teaches users sufficient information about the artwork (in terms of content).
- The toolkit offers sufficient options (tools) that suit different users.
- The toolkit teaches new techniques and ways to discover / experience art.
- The toolkit offers sufficient freedom of choice to the users, during their museum visit.
- The toolkit provides help to users to collaborate as a team to discover the artwork.
- The toolkit does not too dominate during the museum visit (time wise and energy wise).
- Users would recommend this toolkit to friends.
- The toolkit provides enough room for users to form their own interpretations and thoughts about the artwork.
- Users would use this toolkit at other museums.
- The toolkit provides a social interaction.
- The toolkit provides a playful interaction.
- Users interacted with confidence.
To validate these assumptions, I asked the participants to use the toolkit, while I observed them and after to fill in a questionnaire to then discuss with me in a walkthrough interview. An elaborate description of the approach and test set up are described in the next section.

8.1.2 Approach (Set-up/prototyping)

Participants were asked to meet up, either at their home or in a public space (due to corona it was not possible to do the tests at a museum, so I improvised a mimicked a museum space). The test was executed in three phases: The pre-test, the test and the post-test.

Pre-test

Before the test, I asked the participants:

- to sign a consent form for video and/or audio recording via zoom, for me to be able to analyse the test afterwards, see Appendix 20 for the consent form.
- to follow a think-aloud protocol (Tomitsch, 2019, p.124) in order for me to gain a deeper understanding of interactions. I put emphasis on the fact that all of their thoughts were welcome and valuable for my research.
- to fill in the pre-test questionnaire, for general information (gender, age, type of visual impairment (what their remaining vision was)), see Appendix 21 for the pre-test questions.

and I explained:
- how the test would go briefly. (I told them I would first introduce the topic, hand them the product and would explain some actions to execute while testing. Then, I would observe them while they use the design for approximately 1 hour. Finally, they would get a post-test questionnaire to fill out (5 minutes) and we would discuss the test and their answers together for 30-45 minutes.
minutes.)
– that they could not do anything wrong, that only the
design was being tested, not their skill level.
– that the test was done to find out what can be better.
So, I would not help them, I would not answer their
questions, only if I found it was impossible for them to
proceed further I would interfere and/or help.

I then introduced them into the museum context, where
they would use the product. I asked them if they could
enact as if they bought the toolkit and would unpack it
and read the instructions at “home” first. I asked them to
imagine to go to a museum and walk through an exhibition
space together. I mimicked a museum space by hanging
printed art on walls that were available at the location.

I also informed them, before the actual testing began,
that the physical part of the toolkit was to be tested. And
that for the application part they could use me as if I was
a phone. So, for scanning the painting I would read the
information out loud and for the critical question part I
would read a question out loud. So, this part would be
prototyped low-fidelity style, to not leave the app out
completely.

The test (1 hour to 1 hour and 15 minutes)
The participants needed to execute two to three different
testing rounds for different artworks. I hung up different
artworks for them to choose from, the artworks varied in
type and from abstract to figurative, see figures 160 to 165.
They were asked to follow the instructions and use the toolkit as how they would use it in a museum: “Please read the instructions in the manual or listen to the instructions in the app, before entering the “museum”.

Then, please carry the toolkit around or hold the toolkit as if you were at a museum. Walk through the “exhibition space” and use the toolkit for at least two different artworks, each time choosing different cards. Use the toolkit like you think you should.”

The tasks they would eventually do were:
– Carry or hold the toolkit as if you are at a museum. Walk through the “exhibition space”.
– Use the toolkit as you think it should be used after reading the instructions.

**Round 1:** Choose a painting.
– Use the description cards, by following the steps written on them.
– Use another set of cards or more than one set.

**Round 2:** Choose a second painting.
– Use the description cards, again.
– Use another set of cards or more than one set.

**Round 3:** Choose a third painting. Optional (The third round was only done when enough time was left, because I wanted them to take their time and not rush them).
– Use the description cards, again.
– Use another set of cards or more than one set.

I observed the tasks they executed and wrote down some of their thoughts and struggles, since they were using the think-aloud protocol. I made the notes according to an observation sheet I made up front, this sheet is shown in...
Appendix 22.

**Post-test (30 to 40 minutes)**
After each user test I thanked the participants and asked them to fill out a post-test questionnaire, either on paper or via their smartphone. This post-test-questionnaire was based on the assumptions I made and was formatted as a 5-point-likert scale to easily answer them. Please refer to Appendix 23 for the post-test questionnaire.

After they filled out the post-test-questionnaire, we walked through their answers, their experiences and my observation remarks to discuss them. The post-test-questionnaire and my observation notes acted as a basis for the post-test interview. These interviews were recorded as well.

**8.1.3 Participants**
The user tests were conducted with 5 groups of two people (including a visually impaired and a sighted person). The tests were done with 3 groups involving visually impaired people (tests 1, 2 & 3) and two groups involving 2 people I provided with glasses that mimicked a specific visual impairment (tests 4 & 5).
<table>
<thead>
<tr>
<th>Test/Relation</th>
<th>Participant</th>
<th>Gender</th>
<th>Age</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study buddies</td>
<td>P1: Ill-sighted (LE 5%, RE 12%, sees contrast and colour)</td>
<td>F</td>
<td>23</td>
<td>Student</td>
</tr>
<tr>
<td></td>
<td>P2: Sighted</td>
<td>F</td>
<td>25</td>
<td>Student</td>
</tr>
<tr>
<td>Couple</td>
<td>P3: Ill-sighted (10%, sees contrast and colour)</td>
<td>F</td>
<td>42</td>
<td>Massuese</td>
</tr>
<tr>
<td></td>
<td>P4: Sighted</td>
<td>M</td>
<td>52</td>
<td>Engineer</td>
</tr>
<tr>
<td>Strangers</td>
<td>P5: blind (since 12 years)</td>
<td>M</td>
<td>69</td>
<td>Volunteer Visio</td>
</tr>
<tr>
<td></td>
<td>P6: Sighted</td>
<td>F</td>
<td>57</td>
<td>Doctor</td>
</tr>
<tr>
<td>Friends</td>
<td>P7: Blind (with taped glasses)</td>
<td>F</td>
<td>70</td>
<td>Retired</td>
</tr>
<tr>
<td></td>
<td>P8: Sighted</td>
<td>F</td>
<td>65</td>
<td>Retired</td>
</tr>
<tr>
<td>Family</td>
<td>P9: Legally blind (with AR goggles, sees contrast)</td>
<td>M</td>
<td>62</td>
<td>Architect</td>
</tr>
<tr>
<td></td>
<td>P10: Sighted</td>
<td>F</td>
<td>17</td>
<td>Pupil</td>
</tr>
</tbody>
</table>
Analysis
During all tests, notes, video and audio recordings were made. After the tests I analysed and brought my notes together. I grouped the observation results together with the post-interview results (based on the post-test questionnaire, notes and recordings I made). According to the notes and answers to the post-test-questionnaires I also listened to the recordings to add to my notes and to find quotes to strengthen my insights.

8.2 Test results
The results are presented in two ways:
The first section shows the results, per assumption obtained through:
- the post-test questionnaire (the scores of the likert-scale);
- observations and post-test-interview.

The second section describes what was good or what aspects can be improved. These insights are organized per component of the toolkit.
8.2.1 Insights per assumption
Assumption which were scored with the questionnaire.
The likert-scale results for the post-test questionnaire are
displayed in the table below.

<table>
<thead>
<tr>
<th>(Scores 5/5)</th>
<th>Test 1 P1 (VIP)</th>
<th>Test 2 P2 (S)</th>
<th>Test 3 P3 (VIP)</th>
<th>Test 4 P4 (S)</th>
<th>Test 5 P5 (VIP)</th>
<th>Test 6 P6 (S)</th>
<th>Test 7 P7 (VIP*)</th>
<th>Test 8 P8 (S)</th>
<th>Test 9 P9 (VIP*)</th>
<th>P10 (S)</th>
<th>AV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear user instructions</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,9</td>
</tr>
<tr>
<td>Equal experience</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4,3</td>
</tr>
<tr>
<td>Satisfied about guidance assistance</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,7</td>
</tr>
<tr>
<td>Satisfied about understanding of artwork</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4,7</td>
</tr>
<tr>
<td>Satisfied about the level of background info</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4,7</td>
</tr>
<tr>
<td>Tools fit personally</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4,7</td>
</tr>
<tr>
<td>Learned new techniques on how to explore art</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,8</td>
</tr>
<tr>
<td>Freedom of choice</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,8</td>
</tr>
<tr>
<td>Stimulates teamwork</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,9</td>
</tr>
<tr>
<td>Toolkit dominant during visit</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,5</td>
</tr>
<tr>
<td>Would recommend to a friend</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,9</td>
</tr>
<tr>
<td>Room for own interpretation</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,7</td>
</tr>
<tr>
<td>Would use at other museums</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4,7</td>
</tr>
<tr>
<td>Total score (65)</td>
<td>61</td>
<td>52</td>
<td>62</td>
<td>62</td>
<td>61</td>
<td>62</td>
<td>64</td>
<td>65</td>
<td>60</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Grade = Total score x (100/65)/10</td>
<td>9,4</td>
<td>8</td>
<td>9,5</td>
<td>9,5</td>
<td>9,4</td>
<td>9,5</td>
<td>9,8</td>
<td>10</td>
<td>9,2</td>
<td>9,8</td>
<td></td>
</tr>
</tbody>
</table>
As shown in the table each assumption was met and scored above 4.3 out of 5 points. This means for each assumption the participants were positive. Also, each participant scored the toolkit high, with lowest grade being an 8 out of 10 and the highest grade being an 10 out of 10.

This means that the star design requirements and therefore the design goal and interaction vision are met. The value of the design for these criteria is high. Since the scores are highly above average.

**Assumptions which were validated through observation and post-test interview:**

- The toolkit provides a social interaction **Yes**
  + Yes, bot sighted and visually impaired participants started conversations easily and both exchanged thoughts and perspectives.

- The toolkit provides a playful interaction **Yes**
  + Yes, The different cards created fun and playful interactions.

- Users interacted with confidence **Yes**
  + The guidelines contributed to the confidence of participants. With the steps they knew exactly what to do and when. Overall, all were confident what steps to take next. No one asked me what to do.

  + The participants needed to learn about the possibilities/tools that the toolkit provided. They discovered this best by doing. Using the toolkit for a second time and third time most users were even more confident to choose what tool to use when. They already knew how to approach an artwork and what options they had to choose from.
- Their confidence did grow along the way, for some sighted participants (from test 3 & 4) it seemed like they got ‘overconfident’ the second/third time, which resulted to not use the image description cards as strictly. In those cases the sighted participant (companion) did use interpretation and I saw the teamwork decrease slightly with the visually impaired participant.

8.2.2 Insights per component of the toolkit
Below for each component of the toolkit is explained what was found negative and/or positive.

1. Instructions: Booklet Manual & App audio instructions
+ All participants found that the manual and audio instructions in the app gave clear guidance on how to start and what to do. Some mentioned that the examples from the audio instructions stuck while they were using the toolkit, which they found helpful. Some participants did not even need the app, but only read the manual out loud.

- Manual and audio instructions could emphasise the necessity to follow the steps very closely and carefully at first to reach optimal effect. This especially counts for the describing cards. A suggestion made by the participants during tests 2, 3 & 4 was: to show a storytelling video or provide a website that shows a good example.
2. Description cards

Following the description guidelines / steps

+ Almost all participants carefully followed the steps on the ‘describe’ cards and executed them very well. Especially in the first round. They mentioned that the steps and instructions were clear.

- Sometimes participants thought they knew what to do, they then (mostly their second round) started to follow the steps on the cards less strict. It was remarkable to see they fell into an old pattern: describing with own interpretation. Soon, a chaotic build-up of their description, without any structure, came up. This made me realize that the cards have high value. It was clearly to me, once the sighted participant does not follow the steps strictly, they are less aware of their word choices (being descriptive and objective) as well.

Describing objectively

+ Participants mentioned they were more capable to describe the artworks objectively with the help of the guidelines. They mentioned that the guidelines and rules stuck even when they made mistakes. The examples on the cards and repetitively mentioning to stay factual and objective were effective. Even when they made word choices, while describing, that were not that clear or too subjective, they were able to corrected themselves.

An example for this, comes from test 5 (participants standing in front of ‘The sun’ by Miro):

P10 (sighted): “There I see .. Uh I mean, I see a kind of dog-like figure at the bottom right. I would interpret it as dog, but I’m not sure. ” You can see she corrected herself twice in one sentence. From the word “there” to “bottom right” and the words “dog-like figure” to “I would interpret it as dog, but I’m not sure”. 

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- Most participants (participant 4, 6 and 8) found it harder to stay objective for abstract artworks than for figurative artworks.

One participant suggested to introduce drawing earlier to communicate the shapes and composition of the abstract work. An example shows this was very helpful.

**P4 (sighted):** “I tried to describe it literally, but it looks like an abstract unrecognisable cow. I see a cow in it, it could be something else. Let’s stick to an animal. I see dots, without clear meaning.”

**P3 (VIP):** “Can’t you make me feel that. It is not clear yet.”

**Learning new things**

+ Sighted and visually impaired both learned and discovered new things because of the description cards, either about compositions, details or shapes and/or shading in the artworks.

+ All sighted participants learned new things from visually impaired companions. A clear example for this comes from test 1. The visually impaired person mentioned she only saw the man in the painting ‘My parent’ (David Hockney) stand out. She said the man was the main thing she saw with her remaining sight, because the rest of the painting was all in blue tones. She mentioned the man was in high contrast with the rest of the painting. The sighted companion gave as a reaction she did not look at it that way (yet). Both then concluded that the man was a dominant figure in the painting. This example shows that the sighted companion found something new due to the perspective of her visually impaired companion.
Doing it together (including each other)
+ All sighted participants included visually impaired participants in their decision making. It is proven that the cards pointed this out clearly. For example: the guidelines saying: “Read out loud” and “Together choose one of the options”, helped for this. See figure 167 and 168.

![DESCRIBE
READ THE CARDS OUT LOUD](image)

Figure 167: Card saying: “read out loud”

![3. EVENTS](image)

1. Choose **one** event in the artwork together and answer the following questions: (Describe literally. Avoid own interpretations.)

Figure 168: Card saying: “Choose ... together.”

+ All participants complemented each other while the sighted participant was describing. Visually impaired people mostly tried to fill the gaps in their story or react to start a conversation.

An example for this is from test 3, after they finished the ‘describing’ cards. Participants were talking about ‘My parents’ by David Hockney:

**P5 (VIP):** “The man is not interested, he is enjoying his newspaper.”

**P6 (Sighted):** “Yes indeed.”
P5 (VIP): “That woman is watching the painter who is painting ... She is posing, but the man is reading in his journal and thinks: ‘I hope you will be ready soon’.”

P6 (Sighted): “Haha, indeed.. that’s exactly it. Yes that man is doing something completely different. They don’t really have anything together. You are right.”

Remarks for specific cards

Colour card:
+ The fact that the guidelines provided an option to describe colours or skip them in the ‘colours-card’, was received well during all tests. Not every visually impaired companion felt the need to talk about colours.

4. COLOURS

1. Do you you want to talk about the colours in the artwork?
   • Yes. Go to step 2.
   • No. Go to card 5.

Figure 169: ‘Colour’ card saying: “Do you want to talk about colours?”

- Some participants found it hard to link nature elements to colours. Since, this requires some form of creative thinking, they used the examples mostly. Figure 170 shows what suggestions are given on the colour card.

2. Together choose one object, figure or person from the artwork and describe what colors this object, figure or person has. (Connect colours with natural elements for clarification, such as: lemon yellow, egg yolk, or grass green.)

Figure 170: Suggestions on the ‘colour’ card, how to describe colours: “egg yolk, lemon yellow, grass green.”

Technique card
+ The suggestions to choose from in the card was relaxing and clear.
- It seemed like they got less creative here as well. Participants mentioned they liked the suggestion. But it seemed when people have something to choose from, they tend to think less themselves. See figure 171.

5. TECHNIQUE

1. What kind of artwork is it?
   Painting, Drawing, Photo, Print, Collage, ...

2. What material was used?
   Canvas, Paper, Glass, Fabric, Wood, ...

Figure 171: The ‘technique’ card providing options to answer the questions.

Figure 172 and 173: Sighted participants describing an artwork during user tests.
3. Drawing cards & Drawing pad

*Build-up of a tactile line drawings*

+ All drawings, from participants, were clearly and logically constructed. The instructions and examples were clear. Visually impaired participants started found that the paper and lines were very easy to trace.

*Figure 174 to 177: Well constructed tactile drawings of “Le Chien” painting by Miro, made by sighted participants: P4, P6 and P8.*

*Explaining the tactile drawing to companion*

+ Visually impaired participants found a verbal explanation with the tactile drawing helpful. Sighted participants were proud of what they drew and explained their drawings to their companion elaborately, they wanted to take their time to really deliver their creation.

+ All participants guided the visually impaired well by guiding their hand on the tactile lines and explaining what they had drawn.
An example for this comes from test 4, standing in front of ‘Le Chien’ by Miró:

**P8 (Sighted)** (after drawing Le chien by Miró): -guiding with her hand- “Here on the left side of the drawing.”

**P7 (VIP):** “Oh yes this is the dress you said? That black figure?”

**P8 (Sighted):** “Yes, that’s the shape of that dress that’s fully black.”

**P7 (VIP):** “ah beautiful”

**P8 (Sighted):** “Then you come to that animal or something.”

**P7 (VIP):** “Oh yes! You are good at drawing, hey!”

**P8 (Sighted):** “Ha! It also makes it clearer to me what I see .. By explaining it this way.”

Figure 178: Sighted participant guides the visually impaired participant through her tactile drawing. Guiding with her hand.
Tactile drawing brings clarification

+ All participant found that drawing brought clarification. Especially for abstract paintings.

+ Visually impaired participants liked the drawing a lot and thought it was very helpful in a quick and easy way. For ill-sighted participants drawing particularly helped to fill in gaps. They mentioned that after the description, they had an image in mind, but then a drawing made it even clearer. For totally blind participants drawings worked either as an aha-moment or sometimes a surprise, because they thought something slightly different. Either way a discussion or conversation started easily about what they both interpreted the artwork.

+ In most situations, drawing helped to get rid of any interpretations that the sighted companion laid on the visually impaired companion, during the image description. A figure or shape that was interpreted a certain way by the visually impaired companion, were mostly easily made clear while drawing.

An example of this, from test 2:

P4 (Sighted) -starts drawing and speaks aloud- : "Okay this is the frame. Here I am going to draw that "cat" "Can you feel its head and tail?"

-hands it over to the visually impaired companion and guides her hand -

P3 (VIP): "No, I feel a diamond. To me it is a diamond."

P4 (Sighted): "Oh, uhh.. the bottom right can be a tail and the two dots could be ears."
P3 (VIP): “I am coloured by your cat and dog. It doesn’t have to be a cat or dog.”

+ Sighted participants mentioned they learned new things while drawing as well, because they needed to take a closer look and carefully make choices what to draw and communicate the message.

**Doing it together**
+ Drawing was also used to, together build the image. Especially for people with remaining sight, they added to the drawings or drew parts themselves. An example for this comes from test 5, where the visually impaired participant (P9) drew what he thought the painting looked like. Then, the sighted companion filled in gaps on that same drawing.

P9 (VIP): “That doll is situated here somewhere. And here the sun we talked about. - VIP keeps drawing a few other shapes, while the sighted companion watches him draw - “I think this is about it.” - VIP touches his own drawing - “How cool is this! I think I have it now”

P10 (Sighted): “Yes? Shall I add some things that I see?”

P9 (VIP): “Did I do well?”

P10 (Sighted): “Yes you did well, but I see some things to add.” -sighted adds figures to the drawing- “Here feel this. And the three hairs on the dolls head.”

P9 (VIP): “Oh wauw this is funny. This is fun! I really get an idea of the composition! I really like it.”

After this they started to talk about the shapes further. The
drawing helped as a base for their conversation, and the story they build together. See the two figures below.

Figure 179: Visually impaired participant draws what he understood and could still see in the painting.

Figure 180: Sighted participant completes the drawing and explains, while she guides his hand touching the tactile drawing.

Most participants talked out loud while drawing. Which is confirmed to be very important.
Remark specific cards:
Own interpretation card:
- The name of the card: ‘Own interpretation’ was confusing. The options participants have are: drawing the composition (card 2), drawing shapes (card 3), and drawing whatever they want (card 4). So the card should be called. Something like: ‘Draw freely’

![Diagram showing options for drawing](image)

Figure 181: Drawing card guidelines with options for drawing. ‘Own interpretations’ was misunderstood.

Example card:
- The example cards (for drawing shapes and composition) should be referred to somewhere on the cards. Participants most of the time did not find the example cards until after they made the drawing. The second time however, they knew they were there.

4. Feeling cards & Material swatches
Guidelines / steps on the ‘feel’ cards
+ All participants found the guidelines for feeling clear.

Use of the material swatches
+ The visually impaired participant mostly choose to use the material swatches, they seemed attracted by touching
it. Material swatches worked inviting to use, participants intuitively started to touch and use them to discuss what was in the painting.

+ Material swatches were used for different purposes and different type of artworks. Participants used them for both abstract and figurative artworks. The material swatches were used to communicate about emotion as well as materials, colours and textures from the painting.

An example where they used the material swatches to express colour and emotion, comes from test 4 (talking about ‘My parents’ by David Hockney):

**P8 (Sighted):** “I’m trying to find a fabric that matches the image.”

**P7 (VIP):** “It can be either a warm or cold painting.”

**P8 (Sighted):** “Let’s see what I would pick. - she takes the velvet fabric - I think .. This one!”

**P7 (VIP):** “Oh kind of velvety.”

**P8 (Sighted):** “Yes, it would give me that feeling if you look at this painting. With very sweet colours and stuff.”

**P7 (VIP):** “Yes, beautiful. Soft.”

- Some sighted participants seemed influenced by the colour or pattern printed on the fabrics of the material swatches. This might influence their touch, because of what they see. During test 3, for example, the sighted participant chose a teddy-like fabric to connect to a dog from the painting. However, the blind participant chose a wool grey more textured fabric. However, this led to an
interesting conversation, why each chose a different fabric.

**Learning new things**
+ The feel cards worked well, both sighted and visually impaired participants got new insights. All participants gained new perspectives.

An example for this comes from test 5 (standing in front of ‘Self portrait’ by Henk Chabot):

**P9 (VIP):** “The artwork is about a century ago. Then I think the jacket is made of wool. So, I’m thinking about this one.” -He points out the grey wool woven fabric -.

**P10 (Sighted):** “Oh, I think this one.”

**P9 (VIP):** “Oh really?! Is he wearing a felt jacket?”

**P10 (Sighted):** “Yes I think it feels like this.”

**P9 (VIP):** “Do you see a weave, pattern?”

**P10 (Sighted):** “No”

**P9 (VIP):** “So it’s a smooth jacket”

**P10 (Sighted):** “Yes”

**P9 (VIP):** “Oh wait, this could be possible as well, this is velvet. Beautiful! That’s nice. Cool!”

**Doing it together**
+ Participants worked well together, while using the feel cards. They mentioned felt equally important, both only using their hands to feel. They complemented each others findings.
Figure 182: Participants both feeling the material swatches.

5. Mimicking cards
Guidelines/steps on the ‘mimic’ cards
+ The guidelines were clear to all participants.

Insightful for different purposes
+ Most participant found enacting a person from the painting insightful to feel emotional and/or body sensations.

An example of this comes from test 2, where the sighted companion places the visually impaired companion in position of the man in ‘My Parents’ by David Hockney:

**P4 (Sighted):** “The man sits like this”

- participant 4 grabs arms and legs of visually impaired companion and sets into position on a chair-

**P3 (VIP):** “Oh the man wants to run away, he’s not happy here.”

**P4 (Sighted):** “Haha yes it could be that indeed.”
Using hands to mimic an object was insightful for shapes and objects.

Figure 183: Sighted participant puts visually impaired participant in position of the man from the painting: ‘My parents’.

Figure 184: Participants mimicking shapes with their hands from two different paintings from Miro.

Mimicking in general

Most participants found using hands to mimic shapes more comfortable to do, than using their whole body and found it still insightful.

- Enacting an artwork was mentioned to be uncomfortable in some type of museums.
6. Question cards

Guidelines/steps on the question cards

+ Question card instructions were clear. The layout was found pleasant. Ill-sighted participants and also sighted participants (that would normally need reading glasses), could read the questionmark cards.

What would it feel like to be in this artwork?

Figure 185: True font size on a questionmark card.

Learn new things

+ All participants used the questions cards and started interesting conversations according to the questions. Some sighted companions also found new insights, because of the answers of the visually impaired companion to the questions.

An example from test 4 (with painting: ‘My parents’ by David Hockney):

P8 (Sighted) (with question card): “Which sound effects would you give this artwork?”.

P7 (VIP): “Bird Sounds”

P8 (Sighted): “Why?”

P7 (VIP): “Well the two people are sitting silently in the living room that you can even hear the birds singing outside.”

P8 (Sighted): “But I don’t see a window.”
P7 (VIP): “There could be one.”

P8 (Sighted): “Huh wow, I don’t see any shadows either. How funny.”

P7 (VIP): “haha maybe no bird sounds then, but intense silence.”

P8 (Sighted): “Yes or the sound of music with violins. Classic music.”

Fun
+ Most participants had fun in using the question cards. It made them laugh, think of personal and emotional perspectives and memories. Most used more than 4 per artwork.

Practical remark
- There were too many question cards. Because of the size and amount, they got heavy and a lot to carry around. Some suggested to make the cards smaller, double sided or to only use the app for this.

Figure 186: Visually impaired participant using the question cards.
7. App: Background information about the artwork
+ All participants that used the app to get background information (some duo’s did not use the app), liked to hear “the actual story” and reflect on their own findings.

An example for this comes from test 3, where both just listened to the background information of the painting ‘My parents by David Hockney:

**P6 (Sighted):** “Yes indeed what you said, when you enacted the man, the man is reading and waiting a bit restlessly.”

**P5 (VIP):** “Can you see that you have described it correctly! My compliments”.

**P6 (Sighted):**” Yes ha! Can you really imagine it?”

**P5 (VIP):** “Yes, I have a complete picture. for sure.”

+ The background information in the app was found a good addition to the toolkit.
  “You first look carefully at the artwork and then learn more, it complements each other” (P10).

8. The toolkit overall
+ The toolkit overall brought fun and laughter. Participants enjoyed using it. All participants enjoyed using the toolkit.

**Guidelines/steps on the cards**
+ All participants found the cards clear and well-structured. They thought the layout was clear and useful. The steps and minimalistic layout (easy to follow simple steps “babysteps”) made it easy for users to follow and understand. Tasks went fluently, since the cards guided them step by step.
- If cards are not followed strictly or read out loud the effect of the toolkit is less. It needs quite some dedication. For one participant (participant 8) this seemed quite a lot of effort.

**Learning new things**
+ All sighted participants learned new things from visually impaired companions. They mentioned they will always look at art differently now. They found the tools helpful to gain new insights. All participants found that each tool provided different kinds of insights and therefore that the toolkit is very diverse.

> “I really looked different at the artworks, because I needed to describe it clearly and wanted to communicate well what I saw. Also, because of her I saw new different things, because our point of view is so different.” (P2)

**Vivid memory of the artworks**
+ Participants mentioned the artworks would stay longer in their memories, because of the approach.

+ Participants like that you can take the tactile drawing with you as a memory.

**Learn while doing**
+ All participants liked the approach and order to use the toolkit. They mentioned it was a logical structured way to approach artworks. Some participant began to use the toolkit more intuitively and started to play around with it (after the first round). For example using material swatches while describing, or introducing drawing earlier when describing an image.

An example of this comes from test 5. The visually impaired
companion asked to show the fabric of the dress of the girl in the photograph (of Erwin Olaf):

P10 (Sighted): “She is wearing a brown dress with short sleeves.”

P9 (VIP): “A dress old-fashioned way? .. Or?”

P10 (Sighted): “Yes. uh.. I think it is old fashioned.”

P9 (VIP): “Or a little summer dress?”

P10 (Sighted): “Well, no. It is a thick-fabric dress.”

P9 (VIP): “Is it a reformed dress? Does it have puffed sleeves? ”

P10 (Sighted): “No”

P9 (VIP): “Okay I want to know what material it is... Show me which.” - VIP grabs the material swatches-

P10 (Sighted): “I think this one”

P9 (VIP): “Oh okay okay! A little bit of a fussy ordinary dress.”

+ All participants said it would take quite some time to use the toolkit. But not in a negative way. But that you need to put some effort in there to get the best out of it.

“‘The more you do it, you get to know the cards better and you know what to do with them. You can go through them faster and know which ones you can use when.” (P5)

“I need this toolkit! You can see, once I deviated from the
steps I fell into an old pattern. I think this toolkit is of great value and teaches you to be objective.” (participant 6)

**Doing it together (Communication)**

+ All participants thought communication went well. They saw it as a new way to communicate and bring value to a conversation between a visually impaired and sighted person.

+ All participants liked the way of working together. “Really nice to do it together. Especially to bring my younger daughter of 17 with me. It forces her to look differently and more critical to art as well. Fantastic!” (Participant 9)

**The toolkit for other purposes and contexts**

+ “Great potential also for a different context”. (P3)

+ “I really liked it. Also nice for two sighted people, like for me and my grandchild.” (P7)

+ “This is also nice for tours! For visually impaired and sighted tours in museums.” (P1)

+ “Would be great for kindergarten, schools and young children museum tours as well.” (P4)

**Practical remarks on the toolkit layout**

- Some participants found the rings with the cards unhandy, they mixed up the order of the cards and found it hard to find the right one straight away.

- Some participants thought the toolkit had too many (too big) components to carry around. They suggested to use less keycords or to provide the toolkit in different sizes and forms as well. Like: small cards, double sided cards, or
use app for some components. They suggested to make different versions.

- The covercards are not that easy to read for all ill-sighted. Participant 2 suggested to give it even more contrast.

**Overall positive comment:**

+ “You have to continue this project after graduation. I would definitely buy this. Something like this does not exist. It is a good start to being independent, but also to create awareness and empathy for visually impaired people.” (P3)
9. Evaluation

9.1 Conclusion

Overall, the 5 duos expressed their enthusiasm for the final concept design. Visually impaired and sighted users expect that the toolkit will have a huge impact on their museum visit.

They were all actively engaged, enjoyed using the toolkit and found it very insightful. They were proud of their own findings and satisfied about the level of information they were provided with via the app.

They enjoyed analysing the artwork, by seeking answers and discovering things themselves, before being provided with background information. They mentioned that exploring in such a way helps to keep a longer lasting memory of the artwork and provides a deeper understanding of it too.

The small, easy to follow steps and minimalistic layout made it easy for users to follow and understand. The guidelines gave clear instructions; all testers were confident what steps to take next. At the same time they said it would take quite some time to use the toolkit, you need to put some effort in there to get the best out of it. They mentioned that the toolkit could work at any museum and for any artwork, but abstract works of art take a bit more effort and practice to describe without any interpretations.

Interaction
Participants complemented and included each other well. The cards stimulated teamwork. The sighted and visually
impaired participants started conversations easily and both exchanged thoughts and perspectives. Participants stated that the toolkit helps to paint a more complete picture of the artwork together. All sighted participants learned new things from visually impaired companions and vice versa: both discovered new things due to each other’s different perspectives and both learned new techniques on how to communicate on an equal level. Participants said they felt equal to their companion because of the divided tasks. They mentioned they will always look at art differently now.

**The toolkit as a whole**
The toolkit consists of multiple components, for most participants much to carry around. Important was to read instruction carefully and follow the steps, because when they did not do that the effect of the toolkit was not optimal.

For all participants the guidelines and examples on the describing cards helped to communicate about visual information objectively. It does take practice to make right word choices and to not make any interpretations, especially for abstract artworks. But overall, using the describing cards, visually impaired people were able to build a clear image of the artwork in their mind without being influenced or dependent on the skills of their sighted companion. For sighted people describing the artwork helped to look from a different perspective, in a new way, discovering new thing.

Tactile drawing helped to communicate composition, build the image further after describing and helped to get rid of any interpretations that the sighted companion laid on the visually impaired participant.
The material swatches helped to: make the artwork come to life; discuss about textures and even communicate the emotional expressions and colours of the people, figures and objects in the painting.

The question cards started conversations easily about: their associations with for example music; their connecting emotions; memories; and personal perspectives.

Enacting helped to: experience physical sensations of the characters from the artwork; communicate shapes with hands; feel the emotions of the persons in the painting; and understand actions between objects, figures and persons.

The background information from the app helped to confirm or discuss own interpretations, reflect on own findings. Participant mentioned this was rewarding.

Overall, the order in which the toolkit cards and tools were used* (Describing > Drawing, Feeling, Questioning, Enacting > Listening to background information > Reflecting), helped the companions to richly explore and analyse artworks together. *Inspired by principles on how to analyse artworks (Panofsky’s layers, on how to understand art; the VTS method, on how to observe art; and the multisensory approaches, on how to explore art).

9.2 Recommendations and future perspective

Communicating the toolkit purpose to the audience
The purpose and value of the toolkit should be communicated with users, from the start. Users should know what they are able to do with the toolkit and what
affect it can have on their museum visit. Instructions and examples need to be pointed out clearly, in different forms, in order to use it appropriately. This could be done with the written manual, the audio instructions in the app and an interaction video on the website or social media page. In this way users know best what the toolkit includes and how it should work. Once they know what the toolkit consists of, they can perform and use the toolkit at its best. After they have done it a couple of times they will get to know the toolkit better and get even more out of it.

The toolkit lay out
The toolkit should be provided in different forms, in order for the users to choose what suits them best. The cards can be made more compact and smaller, for example by changing the layout slightly or printing them double-sided. Another option is to provide the toolkit with the question-cards in the app, which also helps to make the toolkit more convenient to carry around. Thirdly an option could be to make the description cards smaller, since they are for sighted people to be used, on the other hand, sighted people pointed out they did not need their reading glasses which is pleasant when viewing an artwork. Another option is to make the material swatches smaller; make the drawing pad even more compact; and/or use fewer key-cords.

Use of the toolkit long-term
The drawing pad (with the special drawing sheets) and the material swatches are physical parts of the toolkit that always will be needed. The critical questions as cards or on the app as well, since there are so many. However, long-term use can only tell if the guidelines will be needed as much after using it a couple of times. Long-term use should also tell how often users need to use the guidelines in
order to master it; and if each component is interesting to use every time.

Ideas and expansion options for the toolkit parts
The toolkit could be expanded in the future as well, such as adding new themed cards (besides drawing, feeling, questions or mimicking).
The drawing sheets could be sold separately, so users are able to buy new ones. Also, a different pen, with different thicknesses to draw different lines, could be added to be able to make more diverse line drawings.
The question cards could be replaced with others, or extended with new ones. In this way users can be challenged or inspired in new ways.
The material swatches could be made of the same colour so that colour of or print on the fabrics do not influence sighted users to truly distinguish them on the textures only.
Also, other material-swatches could be offered for different purposes, such as: expressing the emotions in the artwork or to separate abstract of figurative art.
Furthermore, tools to mimic shapes could be added, like kneadable objects or bendable wires.
The app could also be further developed and be expanded. It could be connected to an online community to share artwork descriptions, questions and/or drawings with each other.

The toolkit for other purposes and contexts
The toolkit might also be interesting to teach (sighted) children, on how to look at and analyse artworks critically with the use of multiple senses. It can also work for museum tour guides, helping them to guide visually impaired people. Thirdly, sighted museum visitors can use it as well: make them analyse artworks together with other visitors and teach them new techniques to look at art
differently. The toolkit possibly works for groups of 3 to 4 people as well. Furthermore, the toolkit can also be used in a different context and for other visual objects, besides 2D artworks, think of: painted ceilings in churches; statues on squares or in parks; and architecture.

**Future development**
The toolkit prototype needs to be further developed, it should first be tested in the context (at Chabot museum), then it also should be tested long term and with more people of the target audience. Changes mentioned above could be made and tested again to eventually be able to design a final product.
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Appendices

Appendix 1: Interview questions Chabot museum

Jisca Bijlsma 23 oktober
Director at Chabot Museum

**Het Chabot museum (Toen, Nu, Toekomst)**
- Wanneer en waarom is het Chabot museum ontstaan?
- In welke ‘categorie’ valt het Chabot museum?
- Wat betekent het Chabot museum voor Rotterdam en andersom?
- Welke relaties heeft het Chabot museum met andere musea?
- Wat is kenmerkend aan de vaste collectie van Chabot?
- Welke werken hangen of staan er permanent in het Chabot museum?
- Sinds wanneer is deze vaste collectie bij het Chabot museum?
- Welk(e) werk(en) typeert Chabot? Waarom?
• Welk(e) werk(en) is/zijn het bekendste/beroemdste? Waarom? onderdeel van een collectie/verhaal?

• Hoe waren/is Hillegersberg en de Rotte met het Chabot museum verbonden?

• Hoe belangrijk is de relatie tussen het Chabot museum en het landschap van Chabot nu en in de toekomst?

• Kunt u iets meer vertellen over het Chabot plein?

De bezoeker
• Wanneer is het Chabot museum geopend?

• Voor wie is het Chabot museum? (Jong/oud/valide/ mindervalide)

• Hoe lang duurt een gemiddeld bezoek aan het Chabot museum?

• Waar begint de ervaring van het museum? buiten? bij de entree? bij de kassa? in de eerste zaal?

• Wat kan de bezoeker ervaren in het museum (zijn er voor extra dingen te doen voor de bezoeker) behalve rondkijken? (Film, rondleiding, excursie, interactieve ervaring)

• Voor wie zijn deze ervaringen/ rondleidingen in het Chabot museum?

• Welke tentoonstelling of gebeurtenis was volgens u het meest succesvol? beste reviews? meeste bezoekers?

• In hoeverre is het Chabot museum verbonden met mensen? Online? Op straat?
De doelstelling: “Kunst (van het Chabot museum) toegankelijk maken voor mensen met een visuele beperking op een rijke en onafhankelijke manier.” We besloten eerder routing en fysieke toegankelijkheid niet te betrekken bij de doelstelling. Dus de volgende vragen gaan over de ervaring van de kunst van Chabot.

- Als we deze doelgroep de kunst van het Chabot museum op een rijke manier willen laten ervaren, welk verhaal willen we dan vertellen?

- De bekendste en meest typerende werken van Chabot?

- Een ander verhaal of “de Chabot ervaring” (zoals u vertelde over Hillegersberg, aan de Rotte)?

- 1 specifiek werk van Chabot?

- Anders?

- Waarom is het er tot nu toe niet van gekomen om de kunst van het Chabot museum toegankelijk te maken voor mensen met een visuele beperking? Waarom nu wel?

- Wanneer wist u dat u verandering wilde voor het Chabot museum wat betreft toegankelijkheid?

- Toegestaan?
  - Blindengeleidehonden?
  - Mobiele telefoons?
  - Cameras?
  - Ipads?
  - Tassen?
  - Jassen?
  - VR Bril?
Het ontwerp
Tijdens mijn oriëntatiefase ben ik aantal inzichten verder wat betreft de doelgroep. De doelgroep wilt graag het museum onafhankelijk bezoeken, dus niet afhankelijk zijn van een begeleide tour. Voor deze doelgroep zijn andere zintuigen van groot belang.

- Wenst het museum een ontwerp, product of service op een vaste locatie of op te bergen en mee rond te lopen voor de bezoeker?

- Als vast object mogelijk is? Waar is er dan ruimte voor een extra object om te plaatsen in het museum? Zo ja waar en maximale grootte?

- Het ontwerp zou multisensorisch kunnen zijn. Wat is toegestaan?
  - Geur samples?
  - Geluid? Met of zonder koptelefoon?

Mijn onderzoek
- Mag ik op een aantal dagen rondlopen en observeren?

- Mag ik bezoekers vragen stellen?

- Mag ik een paar keer langs komen om een kleine test uit te voeren? met medestudenten?

- Ik wil graag een generatieve sessie/creatieve sessie en test doen in het museum is dat mogelijk?

Inspiratie en Extra vragen
- Welke projecten werkt u momenteel aan die inspirerend kunnen zijn voor dit onderzoek?
• Welke andere initiatieven/musea/mensen waar u nu mee samenwerk, wenst u te betrekken bij het project?

• Heeft u in andere musea een soortgelijk product/project gezien wat u interesseerde of inspireerde?

• Ik ben meerdere vormen tegen gekomen van de naam van de schilder. Is het Hendrikus, Hendrik of Henk Chabot?

• Wat is uw favoriete werk van Chabot? Waarom?

**Interessante links/Documentaire/boek/artikel/Link?**

• Chabot Museum: https://www.chabotmuseum.nl/

• Wikipedia over Hendrik Chabot: https://nl.wikipedia.org/wiki/Hendrik_Chabot

• Documentaire: “Land van Chabot” https://www.youtube.com/watch?v=-3tf58ZcBZ8&t=29s

• Het gebouw: https://www.youtube.com/watch?v=Q5255_059_E

• Chabot Museum - Schilderijen, beelden, tekeningen - Een overzicht: https://www.youtube.com/watch?v=jRyMwlvgLsU


Appendix 3: References to Museums, Companies, Initiatives and Foundations for visually impaired people

Museums with special tours

• Stichting Nationaal Blindenmuseum, Den Haag: http://www.nationaalblindenmuseum.nl/

• Kunstmuseum (Gemeentemuseum), Den Haag: https://www.kunstmuseum.nl/nl/collectie/de-blinde-liereman


kunt een rondleiding volgen langs een aantal topstukken uit de permanente tentoonstelling van het museum.


- Stedelijk museum, Amsterdam: Het Stedelijk Museum is toegankelijk voor iedereen die nieuwsgierig is. Voor bezoekers met een beperking biedt het museum speciale voorzieningen en programma’s aan. https://www.stedelijk.nl/nl/bezoeken/toegankelijkheid


- Sonnenborgh, museum sterrenwacht. Speciaal voor blinden


• Dit verhaal wordt ondersteund door het kunnen voelen van diverse originele voorwerpen in een omgeving met sfeergeluiden. De rondleidingen worden in kleine groepen gehouden.” https://www.kubes.nl/agenda/rondleidingen-oorlogsmuseum-eyewitness

• Expositie VOEL! bij Stichting KunstWerkt in Schiedam, een expositie waarbij de werken van alle deelnemende kunstenaars mogen worden aangeraakt! https://mirjamboomert.nl/exposities/in/articletype/articleview/articleid/675/voel


• Depot wageningen. Rondleidingen voor blinden, slechtzienden
en/of rolstoelgebruikers. https://www.hetdepot.nl.nl/search/slechtzienden


- Rijksmuseum met een app. Ontdek zelf het mooiste van het Rijksmuseum met de unieke multimediatours. https://www.rijksmuseum.nl.nl/ontdek-het-rijksmuseum-met-de-app


Other special experiences/tours


- Hortus Oculus. “Hortus Oculus is een initiatief van Stichting Land Art Delft. Het idee om een belevingstuin te ontwikkelen voor mensen met een visuele beperking is ontstaan uit een gemeenschappelijke fascinatie van Paula Kouwenhoven (directeur LAD, WAD en beeldend kunstenaar) en Birgit de Bruin (gastcurator en ingenieur).”https://hortusoculus.nl/over_ons/


Kunst voor een visuele beperking


- I.M.Perfekt, Jan Anoniem exposeert (6 oktober 2019). www.jananoniemexposeert.nl


- Tangible copies of the world’s masterpieces - https://www.youtube.com/watch?v=MX2zB7hXtOk

Kunst Initiatieven voor of met visueel beperkte mensen

- Museum4all: Over toegankelijke musea http://www.museum4all.eu/

- Museum futures lab op faculteit Industrieel ontwerpen in Delft. Museum Futures lab explores how museum experience design
can lead to long-term engagement of audiences with museums or their collections. https://delftdesignlabs.org/museum-futures-lab/

- RAAK stimuleringsprijs: Nederlandse musea die nog geen specifiek programma hebben voor mensen met een visuele beperking dagen we uit mee te dingen naar de RAAK Stimuleringsprijs. Met deze prijs kan de winnende musea een specifiek programma ontwikkelen voor mensen met een visuele beperking. https://raakstimuleringsprijs.nl/prijs/


- Private eyes is een serie intieme portretten van mensen met een oogafwijking. Met dit project is Maartje Brockbernd afgestudeerd aan de Fotovakschool in Apeldoorn. https://pf.nl/dicht-op-huid/


- Simon Dogger - Tik-Tik van Abbe Museum: App voor navigatie en uitleg bij schilderij https://www.simondogger.nl/tiktok.html?fbclid=IwAR3AI0J4Z4Mq0BoNpLlzSWNPVKITsRx-Pulv-
5D, Amsterdam: 5D staat voor Toegankelijk Theater maken. Theater voor en door mensen met- en zonder beperking. http://wijzijn5d.nl/wijzijn5d/

Stichting kunst werkt. http://stichtingkunstwerkt.nl/


**Andere initiatieven**

- Blinden & Slechtdzienden op InfoNu.nl: http://miske.infoteur.nl/specials/blinden-en-slechtdzienden.html

- Oogaandoeningen op InfoNu.nl: http://miske.infoteur.nl/specials/oogaandoeningen.html

- Oogtweetjes & Oogtips op InfoNu.nl: http://miske.infoteur.nl/specials/oogtweetjes-en-oogtips.html


- Beeld & Geluid zoekt mensen met een visuele beperking! Ze willen samen onderzoeken hoe video’s beter te begrijpen. @beeldengeluid.nl.

• MOET JE HOREN. Audio-artikel met rondleiding door expositiecoördinator Adri Hopman. Interview Moet je horen: https://www.kubes.nl/exposities/impressies/audio

• Izi Travel. “om steden, musea en hun verhalen te verbinden met reizigers die de wereld op een nieuwe, innovatieve manier willen verkennen: via een wereldwijd, open en gratis platform.” https://izi.travel/nl

Organisaties voor mensen met een Visuele beperking

• Oogvereniging: De Oogvereniging is de patiënten- en belangenorganisatie voor alle mensen met een oogaandoening in Nederland. https://www.oogvereniging.nl

• Bartimeus: Wij zijn Bartiméus. Wij zijn er voor alle mensen in Nederland die slechtziend of blind zijn. https://www.bartimeus.nl/over-bartim%C3%A9us

• Oogfonds: Alles over oogziektes https://oogfonds.nl/oogziektes/cvi-cerebral-visual-impairment/

- Vrijwilligerswerk voorlezen: https://www.dedicon.nl/onsexperts/vrijwilligers

- Thinkable (2002 by Jaap Breider): “We are specialised in products and services to create tactile graphics. To understand our fascination for this we would like to involve you in the What, When, Why and How on tactile graphics.” https://thinkable.nl/about-thinkable/

Online
- Be My Eyes, App: Be My Eyes is a free app that connects blind and low-vision people with sighted volunteers and company representatives for visual assistance through a live video call. https://www.bemyeyes.com

- Door de Ogen van: Documentaire https://www.doordeogenvan.org/ Documentaire: https://www.doordeogenvan.org/documentaire/


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• Voorstekamer, verantwoordelijk voor een aantal luistermagazines voor blinden en slechtzienden. https://www.voorstekamer.nl/

• Scribit is een innovatief en uniek platform waarmee audiodescriptie kan worden toegevoegd aan online video’s. https://scribit.tv/ https://www.bartimeus.nl/cli%C3%ABnten/nieuws/kent-u-scribit-al

• Earcatch: Audiodescriptie voor film en tv. Earcatch vertelt wat je niet ziet! https://www.earcatch.nl/


• Hulpmiddelen. (Audio & communicatie; Dagelijks gebruik; Lezen & schrijven; loep; Loeplamp; loophulpmiddel; Mobiliteit; Overig; Revalidatie; Software; Taststokken; Uurwerken; voorleesapparaat; Vrije tijd) https://slechtdien.nl/hulpmiddelen/

• Daisyspeler (hulpmiddel). https://www.youtube.com/watch?v=ff252HWNwAY


• Envision: Envision is a smartphone app that enables users to
convert images into speech, making visually impaired individuals more independent. The app can, for example, describe scenes, people and read letters or street signs aloud.

**Technologie**

- NFC Chips https://www.iculture.nl/uitleg/nfc/


Appendix 4: List of Design take-aways of Literature research

Design take-aways:

- The design could be accessible for all women and men, of all ages with different types of visual impairment.
- The design could take the differences in vision between the different visual impairments into consideration for layout and design choices.
- The design could be able to be used at least partially or as a whole independently by a visually impaired user in a museum.
- The design could make an independent visit to a museum possible. By independent meaning separated from special guided tours or other fixed-agenda programs.
- The design could not be dependent on a guide of the museum in order to be used and understood by a visually impaired person.
- The design could make the artwork experience for visually impaired museum visitors independent of the knowledge or skills of other people, in order to explore artworks.
- The design could help visually impaired people be equal to their companion, friend or family member, during their museum visit.
- The design could be easy and convenient to use while navigating or when moving around in the museum.
- The design could approach the visually impaired user on an equal basis as the sighted user. The design could provide an equal part in use for the visually impaired user as for the sighted user.
- The design could make conversations about artworks possible between sighted and visually impaired museum visitors for social inclusion. The design could tap into vision differences of ill-sighted and legally blind users.
for them to use their remaining sight.
- The design could include auditory and tactile tasks/ experiences.
- The design could be allowed at a museum, so it could not include tools restricted from museums or could give alternatives for forbidden objects.
- The design could include other ways than or besides braille to provide information of an artwork. The design could be an inclusive design and provide opportunities in use for the whole target group (different people with different visual impairments).
- The design could create a way to involve visually impaired, interested in art, into the visual art world.
- The design could tap into the ‘three layers of Panofsky’ on how to understand art (Panofsky’s layers:
  1. Looking (observation: gather visual information, without judgement: VTS),
  2. Seeing (applying meaning to what is observed),
  3. Thinking (thinking about what is observed and interpretation).
- The design could be a solution to fit into different museum contexts to help visually impaired individuals experience the art.
- The design could be innovative and different from programs that already exist.
- The design could also provide a new experience for sighted museum visitors.
- The design could provide a tactile experience.
- The design could keep into consideration that not all artworks can be touched.
- The design could not be dependent on museum restrictions.
- The design could fit or be implemented for different exhibitions, museum spaces and buildings, in order to provide a freedom of choice on what artworks to explore.
Appendix 5: Dutch Design Week Exhibitions

Dutch Design week: www.ddw.nl.

Dare to Feel, Alicja Czop
Dare to feel by Alicja Czop, a Polish designer specializing in Product and Industrial Design.
Result: “Intimacy is strongly based on touch and smell. ‘Dare to Feel’ is a series of products which will create an intimate and safe to release emotions by using these key senses.”

Play with Stellæ!
Play with Stellæ! Stellæ is an inclusive and sensorial toy that wants to bring the night sky and the constellations to blind and visually impaired kids.
Result: “In most cases people with a visual impairment still have the skill of light perception, which means they can still see the high contrast of dark and light.” It is hard to trace lines with the fingers.

Ailes Noires, Anne-Jan Reijn and Bores de Beier
Ailes Noires by Anne-Jan Reijn and Bores de Beier. A scent experience. Ailes Noires is the scent of danger and the perfume in gas.
Result: Smell can provide information.

Contatto Experience, Giulia Soldati
https://www.ddw.nl/en/programme/1885/the-object-is-absent
Contatto Experience, by giulia Soldati, is a culinary approach that emphasises the sensorial experience of food preparation and consumption. Focus is on the hand
instead, extending taste to the realm of touch. Result: Food can help immerse during an exhibition, it makes people interact and starts conversations. However, it is not hygienic and it is very personal.

**Ambient comforter, Yulia Aster**

http://www.studentshow.com/gallery/78906665/The-Ambient-Comforter

Ambient comforter by Yulia Aster. The Ambient Comforter is a musical interaction blanket. Result: According to the users interaction with it, ambient harmonic sounds are produced to create a comfortable and serene atmosphere. This helps the user to overcome the daily level of stress and when it is used as a regular ritual, it can calm the mind from troubling thoughts, emotional tension or even anxiety.

**Homo sensorium space, Baltan Laboratories, Natlab, Broet**

https://www.ddw.nl/nl/programma/1617/homo-sensorium


**Artivive, Carina**

https://artivive.com/Artivive! by Carina is an extended art experience and way to explore artworks with the Artivive app – the visualisation tool. Artivive offers a new and innovative way for the audience to interact with the exhibits. Visitors have to use only their own smartphones or tablets in order to experience the layer of Augmented Reality. Artivive is the platform where artists build the future of analog and digital art.

“Our vision is to change how art is created and consumed and build the community around augmented reality art.”
Results: No additional hardware or maintenance costs; Target new visitors – extend target groups; Interactive guides; Statistics about interests; Active involvement of the visitor; Higher emotional experience; Start right away with only one artwork; Monthly scalable
<table>
<thead>
<tr>
<th>Physical Behaviour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Facial expressions, gaze, gestures, posture, body language, vocal utterances, indicators of emotional state)</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Interface Part / Location</th>
<th></th>
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<table>
<thead>
<tr>
<th>User Goal / Task</th>
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Appendix 7: Short Interview Questions

Short interview with visually impaired

- Wat is uw visuele beperking? En hoelang?
- Kunt u uw zicht beschrijven?
- Hoe beweegt u zich? Heeft u hulpmiddelen?
- Wat betekent kunst voor u? Gaat u naar het museum? Wat was beste en slechtste ervaring met een museumbezoek die u heeft gehad sinds uw beperking?
- Wat is de voornaamste aantrekkingskracht wat een museumbezoek zou moeten hebben?
- Wat zijn problemen die u tegenkomt in musea? Wat mist er nog voor u in onze musea?
- Bent u wel eens bij een ‘speciale’ rondleiding geweest? Zo ja, waar? Hoe zat de rondleiding in elkaar?
- Wat zou interessant zijn voor u specifieke beperking?
- Bent u zelf iets tegengekomen wat opviel (musea of andere culturele activiteiten)? Vernieuwend was? Een initiatief dat ik moet opzoeken? Interressantel links?
- Eigen ideeën delen?
Short interview with experts of companies for visually impaired people

• Wat doen jullie bij X allemaal?

• Waarvoor kan iemand met een visuele beperking bij jullie terecht?

• Wat is precies de doelgroep die jullie aantrekken met deze projecten? (Welke beperkingen komen jullie het meeste tegen wat is de grootste vraag voor X?)

• De doelgroep kan heel divers zijn qua niveau en beperking. Heeft u tips hoe ik daarmee om kan gaan voor mijn ontwerp?

• Hoe kan ik co-creation sessie doen? Welke materialen zijn er?

• Kunt u iets meer vertellen over lopende projecten waarvan u heeft gehoord? (ook omtrent musea)

• Hoe krijg je een kijkje in de belevingswereld van blinden/slechtzienden?

• Wat kan er beter in de culturele sector?

• Bent u zelf iets tegengekomen wat opviel (musea of andere culturele activiteiten)? Vernieuwend was? Een initiatief dat ik moet opzoeken?

• Andere contacten? Interessante links?

• Zouden we op een manier kunnen samenwerken?

• Zelf ideeën?
Short interview with experts of museums about programs for visually impaired people

- Wat doen jullie bij X allemaal?
- Welke verschillende tours hebben jullie begeleid en waar?
- Hoe/Met wie komen de bezoekers?
- Hoe zit volgens u een goede rondleiding in elkaar? In hoofdlijnen?
- Wat zou mogelijk moeten zijn in de toekomst bij het geven van een tour voor mensen met een visuele beperking? Welke tool (zou alles mogen zijn) zou welke handeling mogelijk moeten maken?
- Wat is de voornaamste aantrekkingskracht wat een museumbezoek zou moeten hebben voor mensen met een visuele beperking?
- Wat werkte echt totaal niet? En wat verrassend genoeg wel met jullie rondleidingen/tentoonstellingen?

Audio/verhaal vertellen
- Wat werkte echt totaal niet? En wat verrassend genoeg wel?
- Bent u zelf iets tegengekomen wat opviel (musea of andere culturele activiteiten)? Vernieuwend was ? Een initiatief dat ik moet opzoeken? Andere contacten? Interessante links?
- Zouden we op een manier kunnen samenwerken/kan ik langskomen/meelopen?
Appendix 8: Deep interview Questions with visually impaired people

Algemeen
• Gezin samenstelling/ thuis situatie?
• Wat is uw visuele beperking? En hoelang?
• Kunt u uw zicht beschrijven?
• Hoe is uw belevingswereld als u kijkt naar uw omgeving? Op wat voor manier?
• Hoe zou ik me het beste kunnen inbeelden wat u ziet?
• Hoe beweegt u zich? Heeft u hulpmiddelen?
• Kunt u braille lezen?

Kunst/Musea
• Wat betekent kunst voor u?
• Gaat u naar het museum? Ging u vaak naar het museum?
  • Hoe vaak?
  • met wie?
• Wanneer was u er voor het laatst?
• Welk museum gaat u vaak? of welke voor het laatst?
• Wat was beste en slechtste ervaring met een museumbezoek die u heeft gehad sinds uw beperking?
• Helpt audio? wanneer niet/wel?
• Wat wilt u graag uit een museumbezoek halen? (sociaal, zelfstandig, diepele rende kunstbeleving)

• Wat is de voornaamste aantrekkingskracht wat een museumbezoek zou moeten hebben?

• Wat mist er nog voor u in onze musea?

• Wat zou een droom bezoek zijn voor u? Hoe zou u zich dan voelen?

• Ideeën voor andere nuttige vragen? Wat betreft museum bezoek slechtzienden? Zintuigelijk gerelateerd/multi sensorisch?

• Heeft u zelf ideeën?

**Tour (expositie)**

• Bent u wel eens bij een dergelijke rondleiding geweest? Zo ja, waar?

• Hoe zat de rondleiding in elkaar?

• Welke onverwachte ontdekkingen heeft u gedaan?

• Wat werkte echt totaal niet? En wat verrassend genoeg wel?

• Wat zou interessant zijn voor u beperking?

**Eigen Ideeën delen**

• Een app? mogelijk? tablet/telefoon?

• Voelbaar toetsenbord om mee te spelen?
• Iets met verschillende interpretaties van verschillende mensen over het schilderij > omschrijving/emotie/geluid associaties?

• Liefst iets voelen/ruiken/proeven/horen?
Appendix 9: Deep interview Questions with experts from museums and of art and culture initiatives for visually impaired people

Deep interview Beelden aan Zee, Kubes

Tours
• Welke verschillende tours hebben jullie begeleid en waar?

• Welke tour vonden jullie het meest memorable om te geven?

• Welke tour(s) waren de meest enthousiaste reacties op? en waarom?

• Hoe zit een goede rondleiding in elkaar? In hoofdlijnen?

• Welke onverwachte ontdekkingen heeft u gedaan in uw loopbaan bij het geven van tours?

• Wat zou mogelijk moeten zijn in de toekomst bij het geven van een tour voor mensen met een visuele beperking? Welke tool (zou alles mogen zijn) zou welke handeling mogelijk moeten maken?

Museum bezoek voor VIPS (zonder tour afhankelijk)
• Wat speelt er momenteel op dit gebied?

• Wat is de voornaamste aantrekkingskracht wat een museumbezoek zou moeten hebben voor mensen met een visuele beperking?

• Wat mist er nog voor de doelgroep in onze musea om onafhankelijk naar het museum te gaan?
**Touch/ voelen**
Wat werkte echt totaal niet? En wat verrassend genoeg wel?

**Audio/verhaal vertellen**
- Wat werkte echt totaal niet? En wat verrassend genoeg wel?
- Andere Zintuigen?
- Andere aanbevelingen?

**Mijn ideeën/richtingen**
- Bespreken van wat ideeën van mij etc.
Deep interview Initiatives/organisations for Visually impaired people

- Hoe bent u bij X terecht gekomen? Waarom en hoe ben je begonnen om te werken met en voor blinden en slechtzienden?

- Wat doen jullie bij X allemaal? (intern wonen? lesgeven activiteiten?)

- Kunt u mij een rondleiding geven/kan ik langskomen?

Doelgroep
- Hoe krijg je een kijkje in de belevingswereld van blinden/slechtzienden? Hoe kom ik in contact met meer mensen om mijn ideeën te testen bijvoorbeeld?

- Welke beperkingen komen het meeste voor bij jullie bij X?

- De doelgroep kan heel divers zijn qua niveau en beperking. Heeft u tips hoe ik daarmee om kan gaan voor mijn ontwerp?

- Welke tools/objecten/onderwijsvormen/activiteiten hebben en doen jullie?

Musea en doelgroep
- Kunt u iets meer vertellen over de projecten omtrent creatieve sector? Wat willen mensen met een visuele beperking uit een museumbezoek halen volgens u?

Mijn ideeën/richtingen
- Bespreken van wat ideeën van mij etc.
- Schetsen laten zien idee uitleggen.
**Vragen omtrent ideeen**
- Hoe worden afbeeldingen bewschreven?
- Wat zijn technieken om te voelen?
- Welke lesmaterialen worden er gebruikt om kunst te bespreken?
- Hoe tekenenen mensen met een visuele beperking?

**Tips**
- Kent u verder interessante projecten voor mij? Of heeft u verder nog tips? Zijn er mensen die ik zou moeten contacten?
Appendix 10: Insight cards

Cluster theme A: Moving around as a VIP

A new experience is tiring
Constantly adapting to a new situation
DEDICON, OB.

Most VIPS don't want to, or are not able to carry a lot. "I always have hand too short with my dog, bad cane."
DEDICON, OBS, INT

Most VIPS only know what the spatial layout of an environment after walking a route.

Most VIPS with a dog move quicker than only with a cane, depending on kind of impairment
DEDICON, OBSERVATION - Joke

My hands are full, but I need them.

A tactile card is often inconvenient to carry.

DORINE, DEDICON, OB
Cluster theme B: Using sight when ill-sighted

For most VIPS change of light needs time to adjust.

Most impairments have difficulties with contrast.

Most impairments can see colours.

Most VIPS have problems with adjusting to light, whether it’s dark or bright.

Environment product.

Some VIPS need extra light/brightness to view an artwork, because of dark environments of museums.

Typography for text in the design should be considered well.

Good contrast.

Good font.

Good colours.

Hello.

Most impairments have difficulties with depth and distance.

For most VIPS contrast is very important for text & product.
Cluster theme C: Audio for VIPS in general

The audio should have no to little background/surrounding sounds/ noise. Because this is distracting.

Story TELLERS in the audio fragment should have a clear voice. Because it can be hard to follow when they don’t.

Audio fragments should be understandable clearly and to little direct or accents, clear voice, unless part of an act or when supporting a story.

For most VIPS too much sound is too overwhelming.

Background sounds should be well considered.

A story/audio fragment should be divided in chapters (like audio books) to easily go back and forth parts.

You should be able to pause audio.

Surrounding noise is distracting when listening to an audio fragment.

Most sounds at the same time is overwhelming.

Audio and volume of different fragment should be balanced and smoothly transforming.

A big sound & volume difference is disturbing and annoying.
Cluster theme D: Image description to VIPS

1 2 3

AN AUDIO FRAGMENT SHOULD BE TOLD SERIAL "LOGICAL"
VIPS, INT

TELL A STORY IN GENERAL FIRST BEFORE GETTING INTO DETAIL
HARTJES, M. 2017
BAZ, 2019, OBS, INT

EXPLAINING 2D OR SHADING OR COLOR TO A PERSON BORN BLIND IS HARD.
BAZ, ACM, INT.

THE LANDSCAPE PAINTING IS DARK-BROWN FROM TOP TO BOTTOM

FOR DESCRIBING AN IMAGE CONCRETE DESCRIPTIONS ARE NEEDED, LIKE COLOUR AND SIZE
HARTJES, M. 2017

CONNECT COLOURS TO SOMETHING CONCRETE
HARTJES, M. 2017
- GRASS GREEN
- SUNFLOWER YELLOW
- WARM RED

Cluster theme E: Touch experience for VIPS in general

FEELING DETAILS IS HARD, IT SHOULD BE DONE CONSIDERED
AUTO, MUSEUM

FABRIC WITH DIFFERENCE IN TEXTURE RAW/SMOOTH CAN HELP COMMUNICATE INFORMATION
SELF, VAN ABBE (03)

FEELING A MAP THERMOMAP MAP IS FIRST DONE WITH TWO HANDS FROM OUTSIDE TO THE CENTRE.
DEFILON OBS.

page 353
Cluster theme F: Touch tactile paper for VIPS

- Feeling lines is hard
- Lines on paper are difficult to trace and picture out by touch only.
- Orientation should be logical on a map. "It should not be random jumping back and forth."
- Thermoform cards/paper is expensive and costs time to adjust the design.

Cluster theme G: Braille

- Braille needs to be placed horizontally on a map/card.
- Most VIPS with little sight can read (slow) or some Braille. If text is used it should be clear and short.
- Not all VIPS can read Braille.
- Most can read a little Braille.

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Cluster theme H: VIP using phone

AN ACT/TASK GOES MUCH EASIER/FASTER THE SECOND TIME
DEDICON, OBS, INT

MOST VIPS WANT TO USE THEIR OWN PHONE. (PHONE AND ANDROID ARE DIFFERENT.)
DEDICON, OB & INT, VIPS

IF/WHEN A TABLET NEEDS TO BE USED VIPS WANT TO USE THEIR OWN TABLET/APP/IPHONE/DEVICE BECAUSE THEY KNOW HOW IT WORKS.

ALSO NO BIG HEAD PHONE, BECAUSE THEY STILL WANT THE ABILITY TO HEAR THEIR OWN COF SOUND

MOST VIPS ARE COMFORTABLE WITH HABITS OR THINGS THEY ARE USED TO.
DEDICON, INT VIP

BARCODE CAN BE USED FOR VIPs, THEY KNOW HOW TO TALK PICTURE
DEDICON, OB & JAN JAPA & INT, VIPS

MOST PEOPLE DO NOT KNOW WHERE NFC-CHIP SCANNERS ARE LOCATED IN THEIR PHONE
DEDICON, OBS

HI SIR!
DON’t SLEEP

SERIEP AND GOOGLE ASSISTANT ARE USED OFTEN
JAN JAPA, DEDICON

SCANNING (A) NFC-CHIP CAN BE DONE BY TOUCH
DEDICON, OBS.

SCANNING (A) NFC-CHIP DOES NOT WORK WITHOUT WIFI
JAN JAPA, DEDICON
Cluster theme I: Apps for VIPS

Design of an App should be Minimalistic in Layout and UI/UE.

An App should need few steps to control the Task/System.

Extra Confirmation Question to delete a file is wanted in an App.

App Design for VIPS should meet VIP Standard, EU Guide.

If the language settings of your phone are set different than the app language, the words are read out loud wrongly.

Using OverVoice and an App at the same time is mostly interfering with Sound.

A part of an App can be designed, the other part is standard (iOS or Android) design.
Cluster theme J: Multi sensory experience in general

**Use other senses as much as possible:** hearing, smell, feel, moving, touch

Hartjes, M. 2017

**Most VIPS think a multi sensory experience is more immersive than only using one sense.**

But it should be combined well & supporting

VIPS, INT.

**Only one sense is not enough for VIPS to provide a rich experience**

Dorine, INT. (S)

**Too much information at once can be too overwhelming, like feeling/moving the card; using a new app; making the NFC chips.**

Debilon, Obs, INT

**Using multiple senses for a rich experience is recommended.**

Bartimeus, Paul interview
Cluster theme K: Interactive sound/art for art

To create an atmosphere and mood of a printed soundart can be used. Feder
Interpretation cannot be used for this purpose.

Architecture

‘For me sound is a shamanic Murmur’

- Bernard Lavigne

Making sounds with ambiguous objects as an interactive tool is fun

Dow, Obs, 00

Interacting with a sound instrument is fun

Keyb, prototype

EXPLORING AN INTERACTIVE SOUNO, VOICE OR INSTRUMENT IS FUN TO DO. JANET & GEORGE.

Kubes, J&J, Int.

It is playful and starts interacting easily

Only pressing buttons without context or explanation is not enough. (The buttons gave different sound and audio).

Keyb, prototype
Cluster theme L: Audio alone used for art

In some cases audio only can be immersive and enough to create a rich art experience.

Kubes, J&J, INT.

Only for an audio recording I won’t go all the way to a museum.

Kubes, J&J, INT.

Rather send me that MP3 for at home to listen.

Kubes, J&J, INT.

The painting is bright’s day

Kubes, J&J, INT.

A full on experience is almost never rendered with audio only, description.

Kubes, J&J, INT.

Using audio during a tour can cause isolation for VIPs, when social interaction is wanted.

Kubes, J&J, INT.

Music, without further information or vision is not enough to understand an artwork.

Dorine, INT. (S)

Cluster theme M: Audio rec. fragments + art practical

If a headset is provided, the sound/volume should be well adjusted/installed.

DDW, OBS & DO

Start .... END

DDW, OBS & DO

When an audio fragment is presented it should be clear when it starts and when it ends.

DDW, OBS & DO

An audio fragment should be recorded with a quiet background according to some

Audio Books

INT, VIPS
Cluster theme N: Story telling about art
(image description)

A story should be told un hurried and organized to follow it properly.

A story told about the artist or artwork is preferably told in peace (serenity).

Audio/voice should tell quietly and accurately.

Once upon a time...

Audio should be rich and juicy in order to stand or work alone.

Then the men jumped over the... (Screamer)

Sound can make an art work experience immersive and rich.

Stories told with emotion is more immersive than a monotonous audio recording.

Audio insights

Story telling audio with a personal/emotional touch is more interesting/immersive than a monotonous voice.

Jeff, van Amel, DO

Vips, int.

Hartjes, M. 2017

Baz, OB.

Baz, annex & Harriet

Interview

Baz, OB.

People started laughing when was told that the artist was skinny like the black curves.

Keyboards, prototype int & obs

DHN insights

Low man voice taugh.

Int, Jessica VP, Eichener
SOUNDS SHOULD BE WELL THOUGHT THROUGH.

FITTING THE SCENE; ADDING VALUE; MATURE

HARTJES, M. 2017

SURROUNDING SOUNDS GIVE AN IMPRESSION FROM THE ENVIRONMENT. HOWEVER AVOID DISTURBING NOISES, EXPLAIN IN SILENCE/SILENCE.

VIPS, INT.

AN AUTOMATIC AUDIO FRAGMENT WHEN ENTERING A ROOM CAN TELL A STORY IN AN IMMERSIVE WAY.

KUBES, J.B., INT.

IT IS NICE TO BE ABLE TO MAKE A PREFERENCE TO WHAT VOICES TO LISTEN TO/WHAT PEOPLE.

ARTBUDDY, Prototype

STORYTELLING BY DIFFERENT PEOPLE IS DIVERSE AND FUN. IT GIVES A DIVERSE IMAGE OF THE ARTWORK.

ARTBUDDY, Prototype

"I SEE TWO GAYS."

"SEE A DARK FACE."

"IT REMOVES ME OF MINDES."

"AND THEN THE DOOR SINGS "PAA"."

"WELL, HOW IS THE FRAGMENT?"

"HOW IS THE SOUND?"

"I'M NOT SURE."
Cluster theme O: Social interaction between VIPS & non VIPS at museum

Most VIPS go to the museum with a friend (non-VIP).

Int. VIPs

The stories in the app were told by different people, but there was no possibility to react. (Maybe?) This is wanted, to be able to discuss and start a conversation.

Artbuddy, prototype

When the partner/companion was using stories across, they could experience things together. This sometimes led to a more guided touching experience and social interaction.

 Baz, OB

Exploring together by VIPs and non-VIP teaches both people more about the artwork.

Baz, Andrew & Harley, interview

For most VIPs, a museum visit should include a social aspect. Experiencing with others increases the chance of a rich experience.

VIPS, INT.

VIPs and non VIPs experience different things and can help and interact (with) each other.

Baz, A&B, INT.

Having a social aspect in the design/app was experienced nice, because it felt like you could experience the art with others and hear their point of view.

Artbuddy, prototype

Communication/human interaction is experienced positive and most of the time adds to the visit in a positive sense.

Kubes, J&J, INT.

Starting a discussion/communication/interaction between VIPs can be done by asking questions, let them tell what they feel, so that different items can experience and dive deeper.

Baz, OB
Cluster theme P: VIPS want to form their own interpretation

- Only interpretation from others is annoying. VIPS want to be independent and want to know themselves.
  
  Dorine, Int. (S)

- Most VIPS want access to what people with sight see. Not interpretations, they want a good tactile representation.
  
  Dorine, dedicon, Int. (S)

- When storytelling and interpretations are told by others, there should be some info of/about the person telling the story (age, picture/drawn, situation).
  
  Artbuddy, prototype

- Only interpretations of other about the artwork is not enough. The actual information dissemination is wanted still for own interpretation.
  
  Artbuddy, prototype

- Having an option, being able to choose between people to listen to gives a feeling of autonomy. It was experienced nice to have a choice what to hear and who.
  
  Artbuddy, prototype

- Interpretations of others can give a richer experience of the artwork.
  
  Artbuddy, prototype
Cluster theme Q: Touch VIP experience for art at museum

A 3D model of the artwork can provide information differently than words.

VIPS, INT.

Only a relief print is not enough.

KUBES, J&J, INT.

WHERE/WHEN POSSIBLE
LET PEOPLE TOUCH OBJECTS

HARTJES, M. 2017

A touch experience always needs explanation.

INT, VIPS, DESIGN

FEELING an object can be supporting and even enrich the experience of an artwork.

PREFERRED, AMBIGUOUS OBJECTS, NEW OBJECTS ARE DESIRED TO TOUCH

PS, INT.

The type of artwork influences the way of touching and experiencing. Niki de Saint Phalle was preferred over, KIAMS Gubbels.

BAZ, OB.

PREFERENCES

Niki was a good artist

Feeling objects in the same circle is clear.

BEELDEN AAN ZEE, OB.
It should be clear to be allowed to use two gloves rather than one. Because two hands to touch can help understand the artwork better.

**BA2, OB**

Use tactile objects, it opens conversation automatically and starts interaction.

**DORINE, INT. (S)**

Touching an artwork or 3D replica of an artwork enriches supports the artwork experience for VIPs.

**HARTJES, H. 2017**

Feeling the artwork is informative, fun and a suitable experience to explore the act.

**BA2, OB.**

Multiple different gloves are used to feel different aspects of a sculpture. Thin, fabric, latex...

**BA2, ADN, INT.**

Gloves make it more difficult to feel the material.

**BA2, OB.**

Relief used in a simple bottle, card can help understanding an artwork.

**BA2, ADN, INT.**

An artwork presented in different ways is very helpful for understanding for VIPs and non-VIPs.

**SELF, VINI, MOBI, 04.08**

Touching should be supported by a story explaining, this could be before, during or after, all different effects.

**BA2, OB.**
Cluster theme R: Taste experience for VIPS at museum

Cluster theme S: Smell experience for art
Cluster theme T: Mimicking art

FEELING A POSTURE OF A BODY MIMICING A PAINTING IS INFORMATIVE AND FUN

BAZ, ANNELE & MARUSS INTERVIEW
Cluster theme U: Target group to focus on

There are many VIPs variations, so no one solution fits all.

Design for multiple VIPs, not one particular group.

VIPs (group) diverse.
A lot in background, interest, experience, level.

Children VIPs are way different to design for than adults or elderly.

Average museum visitor is 60+, higher educated and with design for a different groups. Include more individuals.

Designing inclusive mean designing for all VIPs.

A lot of different impairments need a lot of different care, but the feeling could be the same.

So many differences between visual impairments. A focus visual impairment is needed for a good design.
Cluster theme V: Aertwork diversity

**Variety in artworks gives a diverse experience during a tour which fit more people.**

**The approach per artwork by the guide depends on it's piece of art; it needs: a long or short explanation, a story upfront, room for own interpretation.**

**Splitting up artworks to print 30 or in relief does not always work well.**

**All art is different, no one product can help understand all different works.**

**We are standing in front of a large sculpture.**

**A very large artwork is harder to understand and get around.**

**Abstract artworks can be (most of the time) harder to understand than figurative artwork.**

**Experiencing one theme by feeling can provide a deeper understanding.**

**Too many different artworks would be too much.**

**Explaining an artwork properly is time consuming.**

**Some will rather would experience a guide artwork better/flower to create a richer understanding than a lot in shorter times.**
Cluster theme W: Accessibility of artworks

1. **WANTED INFORMATION ABOUT THE ROOM BEFORE RECEIVING OTHER INFO OR EXPERIENCING DOING SOMETHINGS**
   - Auto, Muzieum

2. **THE ARTWORKS THAT CAN BE TOUCHED SHOULD BE EASY TO REACH AND GET ACCESS TO.**
   - BA2, OB

3. **BRAILLE SHOULD BE PLACED HORIZONTALLY ON A EASY ACCESSIBLE SURFACE, RATHER THAN VERTICALLY LOW ON A WALL.**
   - Dorine, Int., OB

4. **“TENTEONGESTELDE OBJEKTEN DIJENEN ZICH OP EEN WEGERTE TE BEVINDEN DIE DOOR IEDEREEN WAAKBAR IS NOREN KAN WORDEN.”**
   - Hartjes, M., 2017

5. **IT SHOULD BE CLEAR AND WELL COMMUNICATED WHAT ARTWORKS CAN BE TOUCHED AND WHICH CANNOT.**
   - Bat, OB

6. **LAYING DOWN AN ARTWORK CAN HELP TO SEE IT UP CLOSE OF ALL ANDER.**
   - Self, Van Abbé, 085

7. **ALSO DISCUSSES WITH MIRRORS.**

8. **MOST ViPS EXPERIENCE WHEN NAVIGATION IS SORTED OUT / WHEN INFO OF THE ROOM IS CLEAR ATENTION CAN GO TO THE ARTWORK.**
   - Vips, Int.

9. **FEELING/TACTILE STATIONS SHOULD BE PLACED CONSIDERED CAREFULLY.**
   - Dorine, Int. (5)

10. **MAKE THE TACTILE STATION EASY ACCESSIBLE.**

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-Berlinerischer Gauleit, 2019

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- This is not convenient for people with sight.

---

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Cluster theme X: Overall museum visit (accessibility)

Design a solution without unnecessary costs -> try to make it 'cheap'. Also then it stays accessible

Hartjes, M. 2017

A museum experience starts the moment you enter the museum and staff welcomes you

Dorine int Veido, Interview (Baan)

A building should be accessible first before any other aspect could be experienced

Hartjes, M. 2017

Most VIPS think that audio devices at museums currently are unhandy or an obstacle for the right experience

Interview, VIPS

Welcome! How can I help you?

VIPS, INT.

A warm welcome at a museum is desired for most VIPS

VIPS, INT.

Most VIPS think a crowded environment is overwhelming, distracting or tiring

VIPS, INT.

Nice that I can change

A prototype, Buzzo

Being able to install and explore the app at home would be nice. To some prepared

A prototype, Buzzo

Welcome! How can I help you?

BAZ, A & M, INT

Een goede verbinding en bereikbaarheid is handig voor VIPS (OV, parkeerplaatsen, voor-ryo homecykheid)

Hartjes, M. 2017
Cluster theme Y: Special tour guide at museum (- guidance)

Ah, sorry! Thomas comes with me, the other one is busy.

When splitting a group in half before entering the exhibition, this should be done clearly. Who goes with whom and where?

Baz, OB.

It's hard to keep a group together.

Baz, OB.

Using words as 'here' and 'there' is unclear. Rather use 'right', 'left', 'behind', 'in front'.

Baz, OB.

What is that?

Baz, OB.

In the left upper corner a triangle is painted.

Baz, OB.

A guided tour has some benefits; questions can be asked about the artworks.

Kubes, JMJ, Int.

Do not use words like: here and there. But: left, up, behind, aside, underneath.

Hartjes, M. 2017

My name is Jim. My name is Nunn.

Kubes, JMJ, Int.

Getting to know the group by a little introduction round is preferable. Just to know who are present and around you, when usually impaired.

Baz, OB.

A guided tour has some benefits; it can be done at separate opening hours and therefore be more quiet, not crowded.

Kubes, JMJ, Int.

A clear start and end wrap up is preferred. Some VIPs where not given a hand in the end and clearly communicated that it was over.

Baz, OB.

Some VIPs are afraid that an interactive experience takes too much time for one or two works.

Vips, Int.

Others like to dive deep into one work.
Cluster theme Z: Independent museum visit for VIPS

**VIPS, INT.**

Most VIPs want to be able to visit the museum independent.

**HARTJES, M. 2017**

Focus on an independent visit. Tours and guides are rising in progress. The independent visit for VIPS needs attention.
Appendix 11: List of Design take-aways from field research

Design take-aways:
• The design could provide a variety of options to explore or be adaptable to different users with different impairments.
• The design could bring visually impaired museum visitors together with a sighted museum visitors in an art experience.
• The design could be able to use in different degrees of independence. Being able to do it partially alone or with help, when wanted.
• The design could make visually impaired people feel independent.
• The design could have similar features of other user-products for visually impaired people. This could help to make parts of the design recognizable and therefore easier to understand or to interact with.
• The design could be easy to carry around, have as little amount of objects (parts) as possible.
• The design could contain easy to follow steps and as few steps as possible execute a task, in order to follow easily and be less tiring.
• The design could provide the opportunity for ill-sighted people to use remaining sight. The design could meet guidelines for colour, contrast, font sizes (could make it readable).
• The design could take light sensitivity, contrast and colours in consideration for different types of visual impairment.
• The design could consider the differences in knowledge and visual memory between people born blind, late blind, legally blind and ill-sighted.
• The design could include some sort of tactile representation or touch experience of the artwork, in
order to gather information through touch.

- The design could consider the level of tactile skill of people.
- The design could provide multiple options to give information, in addition to braille (for example: audio description, voice-over, big text font).
- The design could give additional explanation when providing tactile information.
- The design could provide verbal explanation to provide information about the artwork.
- The design could make it possible for visually impaired people to explore artworks together with their sighted companions to experience their visit as more fun and get more out of their visit.
- The design could start a form of social interaction, discussion or conversation about the artwork between users.
- The design could make users exchange their perspectives, think critically and enlighten views of the other in order to inform and broaden each others views.
- The design could provide an informative and interesting exploration for both blind, legally blind, ill-sighted and sighted users.
- The design could also be able to use between people with a different background, impairment or interest, and complete strangers could feel comfortable using the design together.
- The design could provide an equal experience to both sighted and visually impaired people.
- The design could leave room for own imagination and interpretation about the artwork for visually impaired users.
- The design could trigger multiple senses or provide opportunities to trigger different senses, in order to provide a rich experience and exploration of the artwork.
• The design could distinguish between type of artworks, like abstract and figurative.
• The design could provide a form of audio or verbal explanation without having to use headphones or be socially isolated of their companions.
• The design could communicate information and stories serial and in a pace as desired by the individual.
• The design could communicate image descriptions chronological and logical.
• The design could communicate in a clear language with direct instructions like ‘right’ and ‘left’ instead of ‘here’ and ‘there’.
• The design could use the right techniques to describe an artwork.
• The design could look for different ways to communicate and explain different layers of information.
• The design could be simple, avoiding use of unnecessary detail when providing a tactile experience.
• The tactile part of the design could be organized serial and logical. Think of a vertical title, an unclear legend, the placing and orientation of braille on the paper.
• The design could not make users execute and explore the obvious or approach them in a childish way, because of their impairment.
• The design could provide tactile surfaces in such a way that there is room and opportunity to touch it with two hands.
• The design could provide a verbal explanation while touching. Explanation while doing is positively experienced.
• The design could consider when to provide verbal explanation, before, after or during touching.
• The design could provide a feeling exercise of mimicking the artwork in order to sense and understand the artwork better.
• The design could not contain a smell or tasting experience, since it is mostly too personal, can be childish or obvious.
• The design could provide help and guidance to help users understand the artwork better.
• The design could provide guidelines and guidance on how to explore and learn new things together.
• The design could not be dependent on a group of people.
• The design could not be influenced by time or have a time limit or needed speed in order to use it.
• The design could provide guidance in different styles or provide a choice between different ways of guidance/assisting to explore the artwork.
• The design could not be dependent of any tour guide or museum employee.
• The design could be placed considerable and carefully in order to use properly by visually impaired museum visitors.
• The design could not limit in choice of what artwork the users can explore.
• The design could be more mobile to move around with and be able to use for different works of art, instead of a fixed and specifically modified station or installation.
• Users could be able to use their own device/phone/headphones when in need of using an app or listening to audio.
• The design could provide a playful and fun museum visit for sighted and visually impaired people: a joint social experience.
• The design could teach users something new about the artwork.
• The design could provide some background information of the artwork.
• The design could make it possible to explore different kind of artworks at different type of museums.
• The design could provide a choice of freedom and independence on how to explore and what artworks to explore.
• The design could be available at all times, independent of a schedule, agenda or tour guide/employee of the museum.
Appendix 12: Creative session plan with peers

Ice break by introducing personal favorite activity. Dive into 5 senses. Explore emotional and social values
• Brief session and Q&A with Problem owner
• Experience of Visually Impaired users
• Discussion and Clustering of insights
• Ideation
• C-box to validate ideas
• Final Concepts with 5W1H (What, Who,
• Where, When, Why, and How)
Appendix 13: Creative session plan with the target audience

The session lasted about 2.5 hours, with the following session plan:

• Introduction round & Ice breaker. Grabbing an object blind from a ‘BlackBox’ and introducing yourself according to that object. This was done to set the mood and to get to know each other a little bit better (Heijne & Meer, 2019, p.248).

• A brief introduction and explanation of the problem statement. The problem statement was as follows: “To design a tool that offers utensils to discover and experience works of art, together with a sighted friend in a rich way (by rich meaning: stimulating multiple senses)”, (Heijne & Meer, 2019, p.238).

• Flower association with a random word. The participants shared out loud, to start associative thinking as a group, the sighted people wrote along on post-its. (Results written on white post-its (X)) (Heijne & Meer, 2019, p.100).

• Brainstorming on post-its, where participants shared out loud and per duo the sighted person wrote on post-its (Heijne & Meer, 2019, p.44).

• Brainstorm on post-its about tools (Results written on light blue post-its (A))

• Brainstorm on post-its (with How to’s (H2’s) (Heijne & Meer, 2019, p.104)) about senses and art

• H2 explore art with audio (Results written on pink post-its (B))
• H2 explore art with touch (Results written on green post its (B))

• H2 explore art with other senses (Results written on yellow post its (B))

• Brainstorm on post its about activities doing together (Results written on dark blue post its (C))

• Ideation (combine all post its of each category pick one (X, A, B, C) to generate ideas in groups of 2).

• The group presents the ideas in elevator pitches (Heijne & Meer, 2019, p. 154).

• Voting best ideas

• Making concepts of the best ideas into posters in groups of 2 (in groups of two, develop the idea and make a poster) (Heijne & Meer, 2019, p. 192).

• The group presents concepts (Heijne & Meer, 2019, p. 195).
## Appendix 14: 60 Generated ideas & Harris profile

<table>
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<tr>
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<tbody>
<tr>
<td>Provides for all visually impaired people (blind, legally blind and ill-sighted visitors) women and men of all ages</td>
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<tr>
<td>Provides an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs.</td>
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<td>Provides a social interaction (conversation/dialogue) for visually impaired visitors together with their sighted companion</td>
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<td>Provides an equal experience to both sighted and visually impaired people when exploring the artwork.</td>
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<td>Provides room for own imagination and interpretation for visually impaired user.</td>
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<td>Provides a joint execution together with a sighted person.</td>
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<td>Provides a playful exploration/experience</td>
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<tr>
<td>Provides an informative and interesting exploration for all different impair and sighted people.</td>
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<tr>
<td>Provides a (rich) auditory together with tactile exploration experiences.</td>
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<td>Provides assistance and clear guidance to explore.</td>
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<td>Provides freedom of choice what artwork to explore (generic tool)</td>
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<tr>
<td>Feasible within museum context and within graduation project MarkGreenaway</td>
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<td>Idea 3: Cardset Box</td>
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<tr>
<td>A cardset with different shaped cards. Each card has a different purpose and should trigger different senses. User gets a box of cards at the entrance. Each cardset belongs to a painting and provides information. The cards are recognized by shape and color and each card communicates something else and teaches users something new about the painting. For example: round blue cards are: sound cards; white square cards are tactile drawing cards; Red triangular cards are: scented cards;</td>
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<th>Idea 4: Art Buddy</th>
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<tbody>
<tr>
<td>An application to scan a painting (2D artwork) and connects the user to a network of people to describe the artwork from their perspectives. They tell what they see, what they feel and/or what they think about when seeing the artwork. For this design the inspiration was the app “BeMyEyes”, where sighted people are connected to visually impaired people to help in daily life tasks.</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Idea 4b: Art music buddy</th>
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<tbody>
<tr>
<td>Alternative to art buddy: an application that allows the user to scan the painting and connects the painting to either a song or a sound. The sounds or music that the user hears come from volunteers/a network from the app. So you listen to interpretations of sounds from other people (with sight) that uploaded their ideas to the artwork. Two-end user.</td>
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<thead>
<tr>
<th>Idea 5: Painter’s story</th>
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</thead>
<tbody>
<tr>
<td>An app on a tablet of the museum that scans a painting (2D artwork). Then, allows you to choose to click on a part of the painting to get further information and background story of the painter. The painting in this case is displayed on a big screen of the tablet and can be used as an interactive touch screen.</td>
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<tr>
<td>CRITERIA DG (Delft Design Guide method, Requirements)</td>
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<tr>
<td>Provides for all visually impaired people (blind, legally blind and ill-sighted visitors) women and men of all ages</td>
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<tr>
<td>Provides an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs.</td>
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<tr>
<td>Provides a social interaction (conversation/dialogue) for visually impaired visitors together with their sighted companion</td>
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<tr>
<td>Idea 13: Interview the painting</td>
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<td>---------------------------------</td>
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<tr>
<td>An app that allows you to ask questions about the painting. Either to a network or information that is provided about that painting by the museum or artist.</td>
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<td>------------------------------------------------------</td>
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<td>Provides for all visually impaired people (blind, legally blind and ill-sighted visitors) women and men of all ages</td>
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<td>Provides a social interaction (conversation/dialogue) for visually impaired visitors together with their sighted companion</td>
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<tr>
<td>Provides a joint execution together with a sighted person.</td>
</tr>
<tr>
<td>Provides an informative and interesting exploration for all different impair and sighted people.</td>
</tr>
<tr>
<td>Provides assistance and clear guidance to explore.</td>
</tr>
<tr>
<td>Feasible within museum context and within</td>
</tr>
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</table>
| Idea 31: Capture it  
Users get a special camera/device that translates paintings into line drawings. Then it can print the linedrawing on raised line paper, to make a quick and fun way to capture the artworks and feel them.  
1. Take a picture of a painting of choice with the capture camera provided by the museum.  
2. Wait for the app to convert it into a line, high contrast drawing.  
3. Wait for the capture it camera to develop the picture on raised line paper. Wait for the paper to develop.  
4. Feel the linedrawing of the painting. | Idea 35: Memory NFC  
Users listen to audio tour on their phone and can add their experience to a memory (NFC) chip. In this way they can listen to the experiences of other visitors too. | Idea 36: Building emotion blocks  
In front of the painting audio description is provided (headphone station). Also a table with clay shapes and other building blocks are layed down in front of the painting. People can make and build shapes of how the painting made them feel. In this way, visitors exchange their experience, their feeling and emotion about the painting with eachother. | Idea 37: Touch Gloves  
Users can put special gloves on, which are connected to stories of each painting. The gloves provide pressure and touch experiences of the products/aspects in the painting. High tech, futuristic idea. |
CRITERIA DG (Delft Design Guide method, Requirements)

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| Provides an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs. |
| Provides a social interaction (conversation/dialogue) for visually impaired visitors together with their sighted companion |
| Provides an equal experience to both sighted and visually impaired people when exploring the artwork. |
| Provides room for own imagination and interpretation for visually impaired user. |
| Provides a joint execution together with a sighted person. |
| Provides a playful exploration/experience |
| Provides an informative and interesting exploration for all different impair and sighted people. |
| Provides a (rich) auditory together with tactile exploration experiences. |
| Provides assistance and clear guidance to explore. |
| Provides freedom of choice what artwork to explore (generic tool) |
| Feasible within museum context and within |

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Idea 38: AI picture and google sketch
Sighted visitor draws on a tablet what they see and describe to the visually impaired companion what to draw. Then, with the tablet they can take a picture of their made painting. Wait for the app to calculate other drawings of previous visitors (AI) and to make a simple drawing of their painting. Then, a simplified drawing can be printed on swelling paper. Feel your souvenir, talk about it and keep it as a memory.

1. Describe
2. Draw
3. Take picture
4. Feel
5. Discuss
6. Memory

---

39. Tactile drawings from others
Visually impaired people walk through the museum together with their sighted companion, with tactile drawings of the artworks of previous visitors. Also, each artwork has scanning function for audio info (scan through app or something). Choose what artworks to walk across and ask and listen and touch together. Also, at the end of the visit, visitors can make their own tactile drawings, to leave behind for the next.

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40. Tactile cards and critical questions
Together walk through the museum with tactile representations of the artworks provided by the museum and critical questions (VTS) on the back of the card/or audio questions (scan through app barcode). Choose what artworks to walk across and ask and speculate together by answering the questions. Also possible to get random critical questions through headphones. Click > Randomize > Listen > Answer > Repeat.

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<p>| CRITERIA DG (Delft Design Guide method, Requirements) | 45. Feel the impairment. Understand the limitations of the other. This design responds to the emotion of the other. Seeing people take on the role of visually impaired and thus experience art. Through which the visually impaired must help the sighted companion to discover the art. Turn roles. | 46. Domotica. Room sensor that registers that you walk into space and starts playing an audio clip. An audio description about an art object. After the description you can touch the tangible work of art, with different sensors on the tangible object that releases scents, which is also a certain part of the art object, so that you get even more into the experience. | 47. Feel the culture (not a product idea, more of an exhibition idea) A quiz in an exhibition, guessing what culture it is. Quiz between the limited and sighted. Limited feels about a piece of cloth in a blind box or listens to a fragment and has to describe it. Then the sighted must guess what it is about. What culture in this case. Experience tool, you play it together. the advantage is that a game arises because other senses are used. |
| Provides for all visually impaired people (blind, legally blind and ill-sighted visitors) women and men of all ages | | | |
| Provides an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs. | | | |
| Provides a social interaction (conversation/dialogue) for visually impaired visitors together with their sighted companion | | | |
| Provides an equal experience to both sighted and visually impaired people when exploring the artwork. | | | |
| Provides room for own imagination and interpretation for visually impaired user. | | | |
| Provides a joint execution together with a sighted person. | | | |
| Provides a playful exploration/experience | | | |
| Provides an informative and interesting exploration for all different impairs and sighted people. | | | |
| Provides a (rich) auditory together with tactile exploration experiences. | | | |
| Provides assistance and clear guidance to explore. | | | |
| Provides freedom of choice what artwork to explore (generic tool) | | | |
| Feasible within museum context and within | | | |</p>
<table>
<thead>
<tr>
<th>48. Scan</th>
<th>49. Drive line (not a product idea, more of an exhibition idea)</th>
<th>50. Emotion painting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan of a QR code leads you to a page, you can choose certain routes. <em>E.g.</em> emotion, food-dishes, music. And a tool or a product, displayed in an experience room, with which you experience what the painting represents. <em>E.g.</em> smell and music from the 19th century and tasting a dish from that time. Time capsule, for all senses.</td>
<td>Audio tour, track with tactile cars. From horse wagons to self-driving cars. You can grab candy in the trolley. That way you can experience the history of the means of transport. And audio. Multiple sensory experience. Presents that you unwrap.</td>
<td>Duo consisting of sighted and visually impaired person go to museum together. Sighted person looks at the painting. Sighted person may only by means of singing, touching, explaining objects without words what kind of painting it is, to the visually impaired. Type of stage play. Game element provides new interpretations of art.</td>
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<tr>
<th>51. Feet Feel</th>
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<tbody>
<tr>
<td>The painting runs from the wall to a piece on the floor, through the museum. <em>E.g.</em> house depicted in the painting, you are on a street. No shoes on, walking around on your socks to feel good. Reproduction painting.</td>
<td></td>
</tr>
<tr>
<td>CRITERIA DG (Delft Design Guide, Requirements)</td>
<td>52. Recognize the fragrance  Based on special spices, you can find excrement of the paintings in front of paintings. The sighted can smell as well as the visually impaired. Game. Scavenger hunt. Look for and choose paintings together.</td>
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<td>-----------------------------------------------</td>
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<tr>
<td>Provides an equal experience to both sighted</td>
<td>Provides an equal experience to both sighted and visually impaired people when exploring the artwork.</td>
</tr>
<tr>
<td>Provides room for own imagination and</td>
<td>Provides room for own imagination and interpretation for visually impaired user.</td>
</tr>
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<td>Provides a joint execution together with a</td>
<td>Provides a joint execution together with a sighted person.</td>
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<td>Provides a playful exploration/experience</td>
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<td>Provides an informative and interesting exploration for all different impair and sighted people.</td>
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<td>Provides a (rich) auditory together with tactile exploration experiences.</td>
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<tr>
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<td>Provides assistance and clear guidance to explore.</td>
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<td>Provides freedom of choice what artwork to</td>
<td>Provides freedom of choice what artwork to explore (generic tool)</td>
</tr>
<tr>
<td>Feasible within museum context and within</td>
<td>Feasible within museum context and within graduation project (DarkGreen=easy, Green=ok, Red=could, DarkRed=hard)</td>
</tr>
<tr>
<td>S3. Different interpretation.</td>
<td>Scan QR code with phone using device or app. Free choice about route, which objects you want to see and discover. The route and visual guidance is done by the sighted. The advantage of being together. There is no text in the artwork itself, but only fragrance and music. This allows VIP to do location and timing, what could be behind this music and fragrance? The sighted does it from seeing the picture, even without descriptive text. Together, therefore, discuss what it could be, based on their own interpretations. The vip from sound and smell, the sighted from seeing. Eventually they press a button (choice) and they get the &quot;correct&quot; real information. Either get them right or start a new discussion. From So, QR code discussion Reply. The discussion, dialogue and comparing own interpretations are important aspects. Information that makes you think. How far do we get together. Also, suitable for small groups.</td>
</tr>
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54. Feel the impairment

Products/3D prints already made (from collaboration with a school or social institution or social network / community). Print out those 2D paintings in a miniature. The not limited is limited (blindfolded). In the space are the 3D prints for the 2D paintings. Blindfolded can by trying to describe the visually limited what he feels. The limited guide the blindfolded (seeing) through the exhibition. They help each other. Different way of looking. Empathy is high here. Move together.

> Social idea. Equalness high.

55. Kneading Art

Feeling the painting. Sighted person kneads/molds what he/she sees with clay in container. Visually impaired person feels. Also pass on for subsequent visitors. What impression does the painting make visually and emotionally? How can you convert it into clay. The intention is that you can also feel and knead it together. Sharing interpretations by touch. Making something that is tangible. Possibly take a tactile translation as a reminder. Do not copy or translate, but really portray it. Not exactly copying, but really translating emotion or interpretation.
Appendix 15: The 9 ideas with the PMI-method

*Elaborated Pluses, Minuses, Interesting results from the 9 chosen Ideas*

1. Cardset Box
P: Provides a playful multisensory experience, because the cards each provide a different interaction and different function.
P: Provides information in a fun playful way, because the cards look and feel attractive and inviting to interact with. 
P: Provides flexibility in use, since it provides cards in a box to carry around. This mobile instead of fixed design gives opportunity to move around freely. This way the design is more flexible than for example with tactile stations or installations.
M: Smells are too personal, steering. Smell should be left out.
M: Box could be inconvenient to carry around.
M: Much cards needed for all artworks, so visually impaired people would still be dependent on what artworks were selected by the museum to provide this box for.
I: The cardset is an inclusive design because the shaped cards are recognized by touch for blind people, and the primary colours of the cards can help for ill-sighted users too.
I: Provides multiple exploration possibilities in one set.
I: Provides choice to the user.

2. Mimic the painting
P: Mimicking and feeling each others posture and hands provides a socially interactive approach to get information about shapes and composition from the artwork.
P: For mimicking no tools are required, which provides independence and a freedom of choice between any artwork.
M: Users can feel uncomfortable or have a lack of confidence to mimic or enact the painting.
M: Without clear instructions how to mimic or enact the painting it can be hard to know what to do for an abstract work of art.
M: Mimic as the only option, would be too minimal.
I: Provides a way of collaboration between a sighted and visually impaired user to provide a deeper understanding of what is in the artwork.
I: Provides a fun and playful way to work together.

3. Mini tactile booklet
P: Provides simple touch experiences for all artworks, yet better than no touch experience at all. Even if it is a little line drawing, it can help understand audio tours better.
P: Provides a nice way of combining touch with audio on the same card: a drawing and a barcode to listen to.
M: The information that the tactile drawing wants to communicate can be too little to understand the information it wants to provide about the painting. The drawings should be considered well.
M: To provide tactile mini drawings for all artworks in a big museum can be impossible and therefore still a problem in freedom of choice and independence.
I: Tactile line drawings could be made upfront by visitors, artists, volunteers and in that sense is rather quickly applicable. So it is quite flexible for multiple artworks and collections.

4. Describe and draw
P: Provides an active participation of the sighted companion to describe and draw.
P: Provides an easy approach, not much is needed.
M: Visually impaired person is still dependent on the skill of their sighted companion, since there is no guidance provided on how to describe or draw.
M: The description or drawing of the sighted person can be too dominant and in control of the imagination and
interpretation of the visually impaired person. Visit is still out of balance, the visually impaired person is dependent on the interpretation of the sighted companion.
M: Drawing without any guidance can be a big step / threshold.
I: Provides a quick way to create a tactile representation of the artwork without being dependent on the museum.

5. Instruction toolkit
P: Provides clear instructions on how to explore together and have a balanced exploration.
P: Provides working together, teamwork.
P: Questions can help start dialogue and conversation about the artwork.
M: Drawing can be hard and too big of a step to do for some people, it should be a choice not a must.
M: Too many instructions can be boring.
M: Drawing for visually impaired people can be too hard or cost too much effort and energy.
I: Provides a way of learning how to explore art together.
I: Provides a freedom of choice in which artworks to approach.
I: Provides interesting information for both.

6. Instruction toolkit App
P: Haptography provides an innovative new interaction.
M: Haptography is high tech and the vibrations has its limitations. Not feasible.
M: A small screen can be too limited.
M: A screen provided by the museum is needed, therefore not independent.
I: A network online provides of many opportunities, volunteers that can provide images etc.

7. Tactile drawings from others
P: Provides social connection with strangers, by leaving something behind for the next visitor.
P: Nice way for a regular visitor to help visually impaired visitors.
M: First a lot of visitors need to make drawings in order for this to work. Not all paintings are then complete, so not independent and free in choice.
M: With enough volunteers it can be interesting, but for every other museum, also the ones with a big collection it is not that feasible.
I: Touching different tactile drawings of different people can be a reason to come back to the same exhibition and have a different experience.

8. Tactile cards and critical questions
P: Critical questions are interesting for both sighted and visually impaired people to inspire each other with their answers and their perspective and interpretations.
M: The cards are a selection of the museum, provided by them. Still not an independent choice or freedom.
I: Questions can be asked by the visually impaired, hearing questions through a headphone randomly gives them power in the specific task (makes them be in charge).

9. Different interpretation
P: Provides two different approaches for sighted and visually impaired to both experience on their own and then after share it with each other.
P: Provides stimulation of different senses.
M: Music can be steering in imagination and interpretation.
M: Smell is unwanted for most visually impaired people.
I: Discussion, speculation and exchanging interpretations provide a new way of getting information. The interesting thing is then for the duo to choose whether they want to hear the actual information about the artwork or if they are content with their own findings.
I: Interesting order in which users explore.
Appendix 16: First version of image description guidelines

Hier volgt een handleiding om een afbeelding te beschrijven.

Wees objectief. Blijf bij feiten.

Vermijd analytische interpretaties of emotionele reacties.

Geef voldoende informatie zodat de kijker een beeld kan bouwen en zelfstandig een oordeel kan vellen over het kunstwerk.

1. Algemeen overzicht

OPTIE 1

Er is …
Er zijn ..
Het schilderij laat zien ...

OPTIE 2

a. Gebruik 5 woorden om samen te vatten wat je ziet.
b. Wat is het meest prominente object op het schilderij?
c. Wat is de algemene stemming of sfeer van het schilderij?
d. Is het een duidelijk figuratief werk of abstract?
e. Is het contrastrijk?
f. Wat zijn de hoofdkleuren?

2. Oriëntatie van het kunstwerk
Wees logisch: gebruik een structuur zoals van links naar rechts of van boven naar beneden.

Kies startpunt op het schilderij. Vermijd woorden als "hier" en "daar": wees specifiek.

a. naast / in de buurt
b. voor = / = achter
c. op de voorgrond
d. op de achtergrond
e. in het bovenste gedeelte / bovenaan
f. in het onderste gedeelte / onderaan
g. aan de linkerkant / aan de linkerkant
h. aan de rechterkant / aan de rechterkant
i. in het centrale deel / in het midden

3. Relaties in het kunstwerk
Vertel hoe de personages en objecten zich tot elkaar verhouden.

4. Techniek en medium
Neem kleur, vorm, grootte en textuur van een object op. Wees beschrijvend: gebruik woorden die een duidelijke en levendige betekenis hebben.
Kleur kun je verbinden met natuurelementen, bv. citroengeel, grasgroen etc.

- Welke kleuren heeft het schilderij?
- Welke kleuren hebben de objecten?
- Welke texturen heeft het schilderij?
- Welke texturen hebben de objecten?

5. Details
Voeg details toe aan de belangrijkste delen van het schilderij. Niet elk detail is belangrijk.
Focus op bepaalde aspecten van het werk.
Appendix 17: List of Design take-aways from ideation

Design take-aways:

• The toolkit could consist of fun and playfully shaped cards, that look and feel attractive and are inviting to interact with. The toolkit could, in this way be more inclusive, design-wise. The different bold colours and simple shapes of the cards are recognizable by touch and remaining vision easily.

• The toolkit could provide a choice between tools and what way to explore and give a choice for its users between different exploration possibilities.

• The toolkit could give clear instruction about how users can mimic a painting, in order to give them more confidence.

• The toolkit could provide more exploration possibilities besides mimicking artworks to choose from, since not everyone is comfortable doing it right away.

• The toolkit could provides tactile drawings, only when they are independent of what the museum provides.

• The toolkit could be flexible for multiple solutions, by making visitors make tactile drawings themselves.

• The toolkit could provide an active participation for the sighted companion by making them draw or describe the painting.

• The toolkit could provide a clear guidance and explanation to the user on how to draw a painting.

• The toolkit could consist of a network of volunteers online to provide information.

• The toolkit could not provide too many instructions, or it could get boring.

• The toolkit could give a reason to come back to the same exhibition, but still give a different experience.

• The toolkit could make visually impaired people be in charge of parts of the toolkit and for other parts the
sighted person, to also create a balance in that way.

- The toolkit could first stimulate discussion, own speculation and exchanging own interpretations about the artwork and then provide the visitors with the actual background information.

- The toolkit could provide this order of exploration: (1.) Gathering visual information/observing (looking for the sighted and listening for the visually impaired companion), then (2.) Applying meaning to it by discussing and exchanging thoughts, and finally (3.) Interpret and reflect by choosing to get the ‘actual information’ provided by the museum. Connecting and comparing to “the right” answers. (Panofsky: 1. Looking (observation: gather visual information. VTS), 2. Seeing (applying meaning to what is observed), 3. Thinking (Thinking about what is observed. Interpretation)).

- The toolkit could give clear instructions and guidance to sighted companions on how to describe an image literally (without own interpretations and/or emotions), in order for the visually impaired person to follow and have room for their own imagination.

- The toolkit could provide an opportunity to discuss interpretations and imaginations, but only after visually impaired people got literal information about the image, such as a clear image description.

- The toolkit could ask questions (providing a choice) asking both the sighted and visually impaired user to be equally important. For example: “Decide together what detail needs to be described”, instead of: “describe an important detail.”

- The toolkit could provide questions that are easy to interpret and answer, like giving answer suggestions and writing short sentences. Example: What kind of artwork is it? Painting, Drawing, Photo, Print, Collage, … .
• The toolkit could provide clear instructions for drawing, including clear steps and examples.
• The toolkit could provide encouraging words to build confidence.
• The toolkit could provide a drawing pad that is easy to carry around (hang around the shoulder) and have free hands to use other parts of the toolkit as well.
• The toolkit could provide a drawing pad with a hard drawing surface and an integrated place for the tactile drawing sheets.
• The toolkit could encourage sighted users to explain and guide the visually impaired user with verbal explanation while touching the tactile drawing.
• The toolkit could include tactile drawing sheets A4 size.
• The toolkit could encourage to draw with one line, not too detailed, simple, bold and lines not too close to each other.
• The toolkit could make the visually impaired person in ‘charge’ of the touching materials part.
• The toolkit could include at least 15 material swatches of materials that differ in touch.
• The toolkit could include examples on how to use the material swatches.
• The toolkit could provide mimicking guide instructions and inspiration on how to mimic, using examples, like changing roles (putting the other or standing in the position of a person from the painting) or using hands to mimic objects.
• The toolkit could provide an alternative for the questions on the cards, by providing them on the app as well.
• The toolkit could provide examples of questions to ask each other, to get inspired in the way of thinking.
• The toolkit could provide colourful, simple, minimalist, high in contrast cards.
• The toolkit must not weight too much to carry around
their neck (cards + materials + rings + keycord).

- The toolkit could provide a keycords to carry the cards around neck and have free hands.
- The toolkit must not provide too many instructions per part, or it could get boring or intimidating.
Appendix 18: List of Design requirements (v2.0)

GENERAL
1. * The design must be accessible for all women and men, of all ages and with all different types of visual impairment (blind, legally blind and ill-sighted visitors) that want to explore art at a museum (inclusive design).
2. * The design must be feasible within the museum context and within the graduation project.
3. The design must be innovative, different from programs that already exist.
4. The design must be safe to use for visually impaired people.
5. The design must be allowed at a museum, so it must not include tools restricted from museums, or should give alternatives for forbidden objects.
6. The design must be easy to carry around, have as little amount of objects (parts) as possible.
7. The design should contain easy to follow steps and as few steps as possible execute a task, in order to follow easily and be less tiring.

INDEPENDENCE
8. The design must be able to be used at least partially or as a whole, independently by a visually impaired user in a museum.
9. * The design must make an independent visit to a museum possible. By independent meaning: separated from a guide of the museum, special guided tours or other fixed-agenda programs.
10. The design must not be dependent on the knowledge or skills of its users, in order to explore artworks.
11. The design must be understood and able to use independent from a guided tour or help from a museum employee.
12. The design must be available at all times, independent of a museum schedule and agenda.
13. * The design must provide a choice of freedom on what type and which artworks to explore (any 2D artwork).
14. The design must be able to fit into or be implemented in different exhibitions, museum spaces and buildings and smartly cover a way to tap into the differences between museums and their collections and knowledge.
15. The design must be mobile to move around with and be able to use for different works of art (instead of a fixed and specifically modified station or installation).
16. The design must provide clear guidance that fit different people (or be adaptable to the different user needs) to explore the artwork independently.
17. The design should not be influenced by time (no time limit) or speed in order to use it.

Tools
18. Users should be able to use their own device/phone/headphones when in need of using an app (or listening to audio).
19. The design could have similar features of other user products for visually impaired people. This could help to make parts of the design recognizable and therefore easier to understand or to interact with.

SOCIAL EXPERIENCE
Balanced and equal visit
20. * The design must provide an equally balanced experience to both sighted and visually impaired people when exploring the artwork, e.g. by providing opportunities, tasks and tools for both.
21. *The design must leave room for own imagination and interpretation about the artwork for visually impaired users.
22. The design must avoid executing and exploring the obvious.
23. The design must not approach visually impaired people in a childish way, because of their impairment.
24. * The design must provide guidelines, information and guidance on how to explore and learn new things together, during their museum visit.
25. * The design must provide an informative and interesting exploration for all different impairs and sighted.
26. The design should use the principles of Panofsky, based on the art experience of sighted people (to help create a similar experience for visually impaired visitors, to help make their exploration equal). The design should then tap into the ‘three layers of Panofsky’ on how to understand art: 1. Looking (observation: gather visual information, without judgement: VTS), 2. Seeing (applying meaning to what is observed), 3. Thinking (Thinking about what is observed. Interpretation).

Inclusion
27. * The design must provide a playful interaction between sighted and visually impaired users. (Allowing them to have fun together while learning.)
28. * The design must provide a joint execution for visually impaired and sighted people.
29. * The design must make social interaction, like dialogue and conversations about artworks possible between sighted and visually impaired museum visitors. (The design must ignite social interaction, discussion or conversation about the artwork between users, give room to ask questions to one and another, to include one another.)
30. The design must make users exchange their perspectives and critical thinking, in order to inform and broaden each other’s views.
31. The design should be able to be used by people with a different background, impurity or interest, (complete strangers should feel comfortable using the design together).

**RICH EXPLORATIONS**

**Learning new things**
32. The design must teach users something new about the artwork (e.g. providing some background information of the artwork).

**Multisensory aspect**
33. * The design must include auditory together with tactile experiences. (Eg. give additional explanation when providing tactile information).
34. The design should include different ways, besides braille, to provide and communicate information (e.g. verbal explanation (audio), text (vision)). This way the design is inclusive and provides opportunities in use for different people with different visual impairments.

**Vision**
35. The design must meet guidelines for colour, contrast, font sizes (readability) and take light sensitivity into consideration for different types of visual impairment.
36. The design should consider the differences in knowledge and visual memory between people born blind, late blind, legally blind and ill-sighted.

**Touch**
37. The design must include some sort of tactile representation or touch experience of the artwork, in order to gather information through touch.
38. The design must consider the level of tactile skill of people.
39. The design must be simple, avoiding use of
unnecessary detail when providing a tactile experience.
40. The tactile part of the design must be organized serial
and logical.
41. The design should provide tactile surfaces in such a
way that there is room and opportunity to touch it with
two hands.

Audio
42. The design must include a form of verbal explanation
to provide information (when using headphones
consider them carefully to avoid isolation).
43. The design must communicate information in a pace
as desired by the users.
44. The design must communicate image descriptions
serial, chronological and logical.
45. The design must communicate in a clear language
with direct instructions like ‘right’ and ‘left’ instead of
‘here’ and ‘there’.

Smell, taste
46. The design should not contain a smell or tasting
experience, since it is mostly too personal, can be
childish or obvious. It does not provide more or better
information than touch or sound.

The toolkit as a whole (order, flow, layout):
47. The toolkit must not include too many instructive
words per part, or it could get boring or intimidating. It
must be effective and straight forward.
48. The toolkit must not weigh much to carry around their
neck (cards + materials + rings + keycord).
49. The toolkit should give a reason to come back to the
same exhibition, but still give a different experience
(each time it could be used differently, in a different
order or in a different setting, therefore it is experienced
differently each time).
Layout toolkit cards:
50. The design must consist of fun and playfully shaped cards, that look and feel attractive and inviting.
51. The toolkit must provide simple and minimalistic to easily interpret the content on the cards.
52. The toolkit must provide a keycords to carry the cards around the neck and have free hands.

Part: Image description:
53. The toolkit must give clear instructions and guidance to sighted companions on how to describe an image literally and objectively (without own interpretations and/or emotions), in order for the visually impaired person to follow and have room for their own imagination.
54. The toolkit must provide questions that are easy to interpret and to answer, providing simple short questions or tasks, questions with answer suggestions or multiple choice. Example: What kind of artwork is it? Painting, Drawing, Photo, Print, Collage, … .

Part: Tactile drawing:
55. The toolkit must let visitors make tactile drawings themselves, to be flexible and independent.
56. The toolkit must provide a clear guidance and explanation to the user on how to draw the artwork to make drawing of shapes, composition or details easier.
57. The toolkit must provide guidelines and examples to the person who is drawing on how to use the drawing materials to make a ‘readable’ suitable drawing on the tactile paper.
58. The toolkit must provide drawing as an optional task, not a must.
59. The toolkit must encourage sighted users to explain and guide the visually impaired user with verbal explanation while touching the tactile drawing they
made.

60. The toolkit must encourage to draw with one line, not too detailed, simple and draw not too close to each other.

61. The toolkit must provide a drawing pad that is easy to carry around (hang around the shoulder or put inside a bag) and have free hands to use other parts of the toolkit as well.

62. The toolkit must provide a drawing pad with a hard drawing surface and an integrated place for the tactile drawing sheets and pen.

63. The toolkit should include tactile drawing paper not smaller than A4 size.

Part: Touching Materials:

64. The toolkit must include at least 15 material swatches of materials that differ in touch.

65. The toolkit must include examples on how to use the material swatches.

66. The toolkit should make the visually impaired person in ‘charge’ of the material swatches part (for example: giving each companion to wear specific keycords. Like, the image description part is for the sighted and the material swatches for the visually impaired).

Part: Mimicking / Enacting:

67. The toolkit must give clear instructions on how users can mimic a painting, in order to give them more confidence.

68. The toolkit must provide more exploration possibilities besides mimicking artworks to choose from, since not everyone is comfortable doing it right away.

69. The toolkit must provide inspiration on how to enact / mimic. The guidelines must give inspiring tasks like “Put your companion in position of a person”, “Use hands to mimic an object”.

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Part: Critical questioning:
70. The toolkit must provide example-questions to ask each other, to get inspired in that way of thinking.

Part: App (optional)
71. The toolkit should provide an alternative for the question-cards, by providing them on the app as well, to make a totally blind person be in charge of this part as well.
Equal experience (requirement number 20):
• The toolkit must ask questions (written on the cards) to both the sighted and visually impaired user to be equally important (providing a choice to both). For example: “Decide together what detail needs to be described”, instead of: “describe an important detail.”
• The toolkit must be inclusive in its design for both to be able to interact in an equal way. Cards that are inviting to interact with for both, either by touch or vision (an inclusive, design for vision and touch, with colour and shape).

Panofsky’s principles (requirement number 26):
• The toolkit must provide a specific order for the users to explore: (1.) Gathering visual information/observing (looking for the sighted and listening for the visually impaired companion), then (2.) Applying meaning to it by discussing and exchanging thoughts, and finally (3.) Interpret and reflect by choosing to get the ‘actual information’ provided by the museum. Connecting and comparing to “the right” answers (with the app).

Joint execution (requirement number 28):
• The toolkit must provide and stimulate active participation to include both. Example: The sighted companion with drawing or describing the artwork and the visually impaired with touching materials and asking questions.
• The toolkit must be read out loud by the sighted companion, to involve the visually impaired companion.
• The toolkit must make sighted and visually impaired users work together, provide task that stimulate teamwork, in order to achieve deeper understanding of the artwork.
## Appendix 19: Large size of the Design goal vs. Toolkit-table from paragraph 7.2

<table>
<thead>
<tr>
<th>For different visual impairments (type/gender/age)</th>
<th>Independent museum visit</th>
<th>Social interaction (together)</th>
<th>Equal experience (balance sighted and visually impaired)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides for different type of visual impairments, because ...</td>
<td>Provides an independent museum visit, because ...</td>
<td>The social interaction as a resulted effect of this part is ...</td>
<td>the visually impaired companion gives an objective description, which makes it possible for the visually impaired person to be on an equal level of perceiving information of the artwork (rather than getting an emotional and subjective explanation, where the sighted person is dominant). Also, both are asked questions to help balance out tasks and decision making. (examples are: “Wo you both like the painting and want to continue with this painting?” “What part of the artwork do you both want to describe?”)</td>
</tr>
<tr>
<td>the image description is free in its use, whether they take 2 minutes or an hour, depending on the needs of the users. Also, options and choices are provided, for example if they would like to describe colours or not, since for some visually impaired people colour is no added value.</td>
<td>image description can be used independent from museum agenda, programs, selections or employees. Sighted and visually impaired companions are in charge what artwork to describe and when.</td>
<td>dialogue through talking by the sighted companion, and listening by the visually impaired companion. Also conversations follow this, from questions from the visually impaired that the sighted person answers.</td>
<td></td>
</tr>
</tbody>
</table>

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<tr>
<th>Own imagination and interpretation</th>
<th>Joint execution (sighted and visually impaired)</th>
<th>Playful interaction</th>
<th>Informative and interesting for both (sighted and visually impaired)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides room for own imagination and interpretation for both, because ...</td>
<td>Provides a joint execution (for sighted and visually impaired), because ...</td>
<td>Provides a playful interaction, because ...</td>
<td>Provides interesting information to create a deeper understanding for both (sighted and visually impaired), because ...</td>
</tr>
<tr>
<td>the sighted person is able to look closely and describe the painting objectively and the visually impaired person is able to create an image and to build own imagination on this description.</td>
<td>the sighted companion needs to look closely and follow the guidelines, the visually impaired needs to listen closely and both get asked questions to answer.</td>
<td>image description guidelines are brought as a more interactive game-like way. And, between the users a social interaction is created were they are both challanged to work together to create the image according to the guidelines (like playing an educative game together).</td>
<td>“ the sighted companion looks differently, pays more attention and creates a better understanding by describing the artwork. “ the visually impaired person gets an objective clear explanation of the artwork to gather information to build the image and form own imagination.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Auditory together with tactile exploration (multi-sensory)</th>
<th>Guidance (assisting tool)</th>
<th>Choice of freedom (any type artwork)</th>
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</tr>
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<tbody>
<tr>
<td>This aspect is an auditory or a tactile exploration of the artwork, because ..</td>
<td>Provides guidance by ...</td>
<td>Provides a freedom in choice by ...</td>
<td>Is it feasible?</td>
</tr>
<tr>
<td>it provides verbal explanation about the artwork. This part provides both with a deeper understanding of what is in the artwork.</td>
<td>providing clear (step by step) instructions on how to describe an image.</td>
<td>providing a set of cards that is mobile to use and learn how to describe any type of artwork (providing image description guidelines).</td>
<td>yes</td>
</tr>
<tr>
<td>For different visual impairments (type/gender/age)</td>
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<td>The social interaction as a resulted effect of this part is ...</td>
<td>Provides an equally balanced experience, because ...</td>
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<tr>
<td>as like the image description, the toolkit provides guidelines for the sighted person. When the sighted person follows the steps on the guidelines it is accessible to any type of visual impairment, especially because there is enough room to ask questions to one another, if everything is made clear.</td>
<td>making tactile drawings can be done anywhere and any time, as long as they have the drawing materials (and the drawing guidelines).</td>
<td>verbal explanation by the sighted while the visually impaired touches the drawing. It starts conversation easily, asking eachother questions and making things clear. Drawing starts conversation about emotions and it provides opportunity to exchange each others' perspectives.</td>
<td>... the sighted person gets a closer more detailed look at the artwork while they draw, since they need to pay attention to what and how they draw. ... the visually impaired person gets to choose what the sighted companion draws and then gets to feel the drawing and a verbal explanation, and gets to ask questions about it.</td>
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<td>Provides a joint execution (for sighted and visually impaired), because ...</td>
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<td>Provides interesting information to create a deeper understanding for both (sighted and visually impaired), because ...</td>
</tr>
<tr>
<td>drawing is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level.</td>
<td>the sighted companion draws and explains, the visually impaired companion traces the drawing by touch and asks.</td>
<td>drawing helps people to interactive in a creative way. The users provides information by making, creating and touching. Interactive use of the tool in a playful way, by using hands. Also drawing can make the a person proud, which is found an aspect of a playful interaction.</td>
<td>... the sighted companion looks closer by drawing. For example to composition and details. He or she learns to look at the artwork in a different way, to really put the essence on paper and therefore gets a better understanding. ... the visually impaired person gets to choose what part he or she want to be translated into a line drawing. Then the tactile information about composition and shapes gives information and creates deeper understanding.</td>
</tr>
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<td>Is it feasible?</td>
</tr>
<tr>
<td>it provides a tactile representation of the artwork. This part helps to create understanding of composition, shapes and details.</td>
<td>providing clear (step by step) instructions and examples on how to draw a tactile drawing of an artwork.</td>
<td>providing a drawingpad (with silicone and tactile paperfilm) that can be used anywhere at any time, together with the guidelines to help create a tactile representation of any type of artwork. Not dependent on what the museum offers.</td>
<td>yes</td>
</tr>
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<tr>
<td>the material swatches are accessible by using hands.</td>
<td>speculating about materials can be done at any time as long as they have the material swatches.</td>
<td>speculation about materials and textures. Exchanging thoughts about what materials may appear in the artwork. Or maybe what emotions they provoke.</td>
<td>both are speculating about what they feel and how this can relate to the artwork. Different exercises are provided as inspiration. they both could close their eyes for example, exchanging thoughts about the materials.</td>
</tr>
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</tr>
<tr>
<td>touching is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level.</td>
<td>both touch the material swatches and discuss the materials and textures.</td>
<td>touching materials make the user feel stimulated and curious.</td>
<td>touching materials provides both sighted and visually impaired people a chance to get a deeper understanding of the sensation of materials and textures in the artwork.</td>
</tr>
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</tr>
<tr>
<td>it provides a tactile experience to relate to parts from the artwork. This part provides information on how objects, figures or people (clothes for example) might feel.</td>
<td>providing clear examples on how to use the material swatches to relate with the artwork.</td>
<td>providing material swatches, which can be used for every artwork and at any time, since they can be interpreted in many ways. Also, for each type of artwork they might have a different meaning.</td>
<td>yes</td>
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<td>Provides an equally balanced experience, because ...</td>
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<td>mimicking the artwork can also be done by any person, maybe some feel uncomfortable. Then, still they are able to touch postures or hand gestures of their companion.</td>
<td>mimicking can be done any time (with the guidelines), without any further help needed from the museum.</td>
<td>conversation about shapes, figures and postures, as well as body sensations and emotions.</td>
<td>both are asked to move, enact and form a shape, figure, object or posture. Either the sighted person stands in a position or puts the visually impaired person in a position, or the other way around.</td>
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</tr>
<tr>
<td>mimicking is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level.</td>
<td>both mimic and feel each others’ posture or put each other in position.</td>
<td>moving the body and working together to achieve a joint goal (deeper understanding) is an enjoyable way of ‘learning’.</td>
<td>mimicking shapes and postures with the body can provide individuals with emotional, empathic response. Standing in a certain way can help feeling a certain way. Also, touching someone standing in a certain position can help to create deeper understanding about shapes and motion.</td>
</tr>
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</tr>
<tr>
<td>asking questions is also for everyone.</td>
<td>asking each other questions from the toolkit can be done at any time, at any museum, independent.</td>
<td>exchanging thoughts, knowledge, memories, imagination and interpretations.</td>
<td>... the visually impaired person can use the app (pressing on a button which then provide a random question) or, when he or she still has remaining sight use the cards to read a question of choice. ... the sighted companion also can use the cards to ask a question of choice. Questions are about own imagination, interpretation and perspective so can be answered by both (because they both got information on what the artwork looks like after image description).</td>
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</tr>
<tr>
<td>questioning is an option after image description, so it comes after gathering visual information, to build further knowledge together on an equal level.</td>
<td>both are asked and answer questions together.</td>
<td>emotional responses and social interaction are used in an enjoyable way to gather information.</td>
<td>asking critical questions to one another provides insights about each others perspective to then build upon, change or question their own idea. In this way a richer understanding of the artwork can be reached.</td>
</tr>
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<td>it provides a verbal form of getting a deeper understanding of each others interpretations and thoughts. Critical questions start discussion and conversation.</td>
<td>providing clear stated example questions to know what kind of questions to ask eachother.</td>
<td>providing an option to ask eachother questions, which can be done with any type of artwork. As long as users are inspired and triggered by the questions they can use it anywhere.</td>
<td>yes</td>
</tr>
<tr>
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<td>The social interaction as a resulted effect of this part is ...</td>
<td>the tools and guidelines provide different tasks and questions for both sighted and visually impaired users. Also, because the toolkit provides a specific order of: 1. gathering information (image description) 2. getting a deeper understanding (drawing, touching, enacting, questioning), 3. getting answers (using the app to get some background information).</td>
</tr>
<tr>
<td>the toolkit provides many options that probably will fit different people (different age, gender, type of impairment).</td>
<td>the toolkit can be used independently from museum programs, guides or special installations. The toolkit provides a mobile set of tools to use any time, any where for any type of artwork or museum. It is a flexible solution applicable for many situations.</td>
<td>exchanging knowledge, thoughts, imagination, perspective and interpretations by talking, drawing, touching, feeling, listening, enacting and asking.</td>
<td></td>
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<td>Provides a joint execution (for sighted and visually impaired), because ...</td>
<td>Provides a playful interaction, because ...</td>
<td>the toolkit provides visually impaired and sighted people with tools to help create a deeper, richer and diverse understanding. Providing new information for both to explore the artwork in new ways.</td>
</tr>
<tr>
<td>by carefully following and executing the steps of the image description guidelines, the sighted visitor can transfer works of art in an objective manner to the visually impaired visitor. The visually impaired visitor can experience the artwork in an equivalent way, without interpretations of the sighted visitor. The aim is to then be able to speculate, fantasize, discuss and interpret the artwork together in an equal balanced way with all the other tools provided.</td>
<td>The tools and guidelines provide different tasks and questions for both sighted and visually impaired users.</td>
<td>the layout of the toolkit is playful and colourful. The shaped cards feel and look inviting to “play” around with. Also, the drawing kit and the material-swatches are inviting to play with. The toolkit provides a playful interaction, because it requires effort from the users and rewards them with enjoyable skill improvement on how to explore artwork together. The toolkit provides tools to “play” with that make the users feel stimulated, challenged, curious, proud.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Auditory together with tactile exploration (multi-sensory)</th>
<th>Guidance (assisting tool)</th>
<th>Choice of freedom (any type artwork)</th>
<th>Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>This aspect is an auditory or a tactile exploration of the artwork, because ..</td>
<td>Provides guidance by ...</td>
<td>Provides a freedom in choice by ...</td>
<td>Is it feasible?</td>
</tr>
<tr>
<td>the toolkit as a whole provides tactile and audio exploration options to create provide a rich exploration of the artwork.</td>
<td>providing clear manual to read beforehand and instructions throughout the toolkit (step by step), to know how to use the tools.</td>
<td>providing many options to make it possible to explore different types of artworks. After describing an image (step 1 of the toolkit), users have the choice to make a tactile drawing, ask eachother questions, mimic, touch materials-watches. For each artwork their should be a fitting exploration option, which makes the toolkit help users be free in their choice.</td>
<td>yes</td>
</tr>
</tbody>
</table>
Appendix 20: Consent form

*Used for the creative session and user test*

Dit toestemmingsformulier gaat over het afstudeerproject: “Kunst toegankelijk maken voor visueel beperkte museum bezoekers”, door Josephine de Vries.

**Verklaring deelnemer**

☐ Ik neem vrijwillig deel aan het onderzoek.

☐ Ik geef toestemming voor het maken van audio- en video-opnames tijdens het onderzoek. Deze opnames zullen alleen voor het onderzoeksproject gebruikt worden.

☐ Ik geef toestemming om de geluidsopnamen uit te schrijven (transcriptie).

☐ Ik geef toestemming om de [video-/ audio-] opnamen [te laten tonen/af te spelen] tijdens mijn afstudeerpresentatie.

Naam: .................................................................

Handtekening: ...........................................................

Datum: .................................................................
## Appendix 21: Pre-test Questionnaire

### Naam

<table>
<thead>
<tr>
<th>Geslacht</th>
<th>M / V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeftijd</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Visuele beperking</th>
<th>Nee</th>
<th>Ja, namelijk: slechtziend / blind / blind geboren</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soort visuele beperking:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laatste museum bezoek</th>
<th>Welk museum?</th>
<th>Met wie?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wat (tour of regulier bezoek)?</td>
<td></td>
</tr>
</tbody>
</table>

### Datum


## Appendix 22: Observation sheet user test

<table>
<thead>
<tr>
<th>Task</th>
<th>Issues</th>
<th>Special remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolkit dragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructies handleiding</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ronde 1:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beschrijven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ronde 2:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beschrijven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ronde 3:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beschrijven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
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<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tekenen / Voelen / Uitbeelden / Vragen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geleerd gaande weg?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gelijkwaardig ?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood ronde 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood ronde 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood ronde 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra comments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Appendix 23: Post-test Questionnaire

<table>
<thead>
<tr>
<th>Item</th>
<th>Helemaal mee oneens</th>
<th>oneens</th>
<th>neutraal</th>
<th>eens</th>
<th>Helemaal mee eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>De gebruikersinstructies waren eenvoudig te begrijpen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ik voelde me niet gelijkwaardig aan mijn compagnon.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>De toolkit assisterde mij bij het benaderen van de kunstwerken op een manier dat ik zonder tool niet zou kunnen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ik ben ontevreden over de level van kennis die ik heb verzameld over de kunstwerken.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ik ben tevreden over wat ik (inhoudelijk) heb geleerd (ben bijgebracht) over de kunstwerken.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>De toolkit bood te weinig mogelijkheden (tools) die bij mij paste.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>De toolkit heeft me nieuwe technieken en manieren bijgebracht om kunst te ontdekken/beleven.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>De toolkit gaf mij en mijn compagnon onvoldoende keuze vrijheid gedurende ons museumbezoek.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>De toolkit hielp me om samen te werken met mijn compagnon, alsof we een team waren die samen kunst ontdekt.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>De toolkit vergde te veel van mijn tijd, energie en aandacht om het goed te kunnen inzetten. (De betrokkenheid van de toolkit overheerste mijn museum ervaring).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ik zou deze toolkit aan een vriend aanbevelen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Er was te weinig ruimte om mijn eigen interpretaties en gedachten te vormen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Ik zou deze toolkit ook bij een ander museum willen gebruiken.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix 24: The toolkit in English

**Components**
- Manual
- Describing cards
- Drawing cards
- Feeling cards
- Question cards
- Mimic cards

**Audio instructions in the app:**

“Hi and welcome to the instructions of the ‘Eye can(t) see art’ toolkit. This toolkit can help you go to any museum together and experience art in an equal way.

By accurately following the steps on the cards and carefully performing them, you will be able to converse or discuss the artworks in an equivalent way.

It is important that you follow the steps precisely to get to know the toolkit. Especially the first few times.

The game always starts with the square green cards where the sighted visitor explains to the visually impaired visitor what he or she literally sees.

Be aware: Describing should be as factual as possible. An example of this is: “In the painting I see a man with a smile on his face” instead of “I see a happy man”. OR “In the photo I see 4 boys sitting on a bench, from left to right”, instead of: “in the photo, I see a bunch of young people doing nothing.” So avoid your own interpretations. Stick to facts.
Once the steps on the green cards have been completed, it’s time to speculate and fantasize about the artwork together. You can use the other cards for this: The blue rectangular cards for drawing, which allows you both to make a tactile drawing of the artwork; The yellow triangular cards for feeling, with material swatches of fabrics, that can help you make the artwork tangible; The red round cards for inspiration to ask critical and personal questions to each other; and the hexagonal pink cards to mimic and enact figures, objects or persons. The important thing here is to involve each other. Do it together.

When you have finished discovering an artwork, you can also use the app to get extra background information about the artwork. Scan the artwork and listen to the story of the artwork or artist.

Trust the process, as you learn along the way to get the most out of your museum visit. Have fun and enjoy your art experience with the toolkit!”
CANT SEE ART

A toolkit to help explore art together at museums. For sighted and visually impaired art lovers.

DESCRIBE THE ARTWORK

DRAW THE ARTWORK

FEEL THE ARTWORK

QUESTION THE ARTWORK

MIMIC THE ARTWORK

Download the app for more.
This toolkit serves as a tool for sighted and visually impaired museum visitors, to experience art in museums together.

By carefully following and executing the steps on the square green cards, the sighted visitor can objectively convey works of art to the visually impaired visitor.

The visually impaired visitor can experience the artwork in an equivalent way, without interpretations of the sighted visitor.

The aim is to then be able to speculate, fantasize, discuss and interpret the artwork together on an equal level.

Components:
5 x set of cards, each with a different theme.
A drawing pad, tactile paper and a pen.
MANUAL

Read the manual before you go to the museum and download the App “eye can(t) see art”.
INDEX

Goal 2
Components 2
How does it work? 3
Instructions to remember 4
GOAL

This toolkit serves as a tool for sighted and visually impaired museum visitors, to experience art in museums together.

By carefully following and executing the steps on the square green cards, the sighted visitor can objectively convey works of art to the visually impaired visitor.

The visually impaired visitor can experience the artwork in an equivalent way, without interpretations of the sighted visitor.

The aim is to then be able to speculate, fantasize, discuss and interpret the artwork together on an equal level.

COMPONENTS

5 x set of cards, each with a different theme. A drawing pad, tactile paper and a pen.
HOW DOES IT WORK?

**STEP 1:**
PICK AN ARTWORK. START WITH THE GREEN CARDS OF THE THEME “DESCRIBE”.

**STEP 2:**

**OPTION 1:** ENOUGH OF THIS ARTWORK? CHOOSE ANOTHER ARTWORK AND START OVER WITH THE DESCRIPTION CARDS.

**OPTION 2:** WANT TO DISCOVER MORE IN THIS ARTWORK? CHOOSE ANOTHER SET OF CARDS TO DIVE DEEPER.

**STEP 3: OPTIONAL**
SCAN THE ARTWORK WITH THE APP AND DISCOVER BACKGROUND INFORMATION FROM THE MUSEUM ON THE ARTWORK.
INSTRUCTIONS TO REMEMBER

The following instructions will help you to execute the toolkit properly.

By applying the following points properly, the effect of the toolkit is optimal.

• Always read the cards out loud.

• Do not deviate from the steps.

• Carefully follow the steps on the cards.

• Trust the process.

• Do it together.
DESCRIBE
READ THE CARDS OUT LOUD

These square green cards provide simple instructions for the sighted visitor to objectively describe the artwork to the visually impaired visitor.
START

1. Choose a work of art.

2. Read the following ground rules carefully to be able to describe objectively.
   
   • Look closely.
   • Stick to facts.
   • Describe without emotion.
   • Avoid own interpretations.

Go to card 1 to start describing.
1. FIRST IMPRESSION

1. I see a .. (painting, photograph, drawing, print).

2. The artwork is:
   - Landscape oriented
   - Portrait oriented
   - Other

3. In the artwork, I see ... (Describe in **one sentence** what is **literally** shown in the artwork. Stick to facts.)

4. The artwork is:
   - Figurative (I see recognizable figures)
   - Abstract (I see unrecognizable shapes)

5. Is the artwork rich in contrast? Yes / No

6. **Two** clearly present colours are ...

Does the artwork appeal to you both?
   - Yes. Go to card 2.
   - No. Start over with another work of art.
2. COMPOSITION

1. Choose a clear structure to describe the composition of the artwork.

Literally describe what you see. Avoid your own interpretations! Be specific, avoid words like “here” and “there”.

Examples:
- From the top down
- From left to right
- From front to back
- From the centre
- Clockwise

Go to card 3 to continue.
3. EVENTS

1. Choose one event in the artwork together and answer the following questions: (Describe literally. Avoid own interpretations.)

   a. What effect do the objects, figures and/or persons have on each other?

   b. What size do the objects, figures or persons have in relation to each other?

Tip: Repeat step 1 for other events in the artwork.

Go to card 4 to continue.
4. COLOURS

1. Do you you want to talk about the colours in the artwork?
   • Yes. Go to step 2.
   • No. Go to card 5.

2. Together choose one object, figure or person from the artwork and describe what colors this object, figure or person has. (Connect colours with natural elements for clarification, such as: lemon yellow, egg yolk, or grass green.)

   **Tip:** Repeat step 2 for other objects, figures or persons in the artwork.

   Ga naar kaart 5 om verder te gaan.
5. TECHNIQUE

1. What kind of artwork is it?
   Painting, Drawing, Photo, Print, Collage, ...

2. What material was used?
   Canvas, Paper, Glass, Fabric, Wood, ...

3. Which techniques have been used?
   Paint, Pencil, Chalk, Ink, Combination, ...

4. What textures does the artwork have?
   Rough, Smooth, Soft, Hard, Silky, ...

Go to card 6 to continue.
6. DETAILS

1. Together choose **one** detail of an object, figure or person from the artwork together to elaborate further. (Avoid emotions. Describe what you literally see.)

If necessary, move closer to the artwork and describe the detail.

**Tip:** Repeat step 1 for other details. Note that not all details are important.

Go to card 7 to continue.
7. CHOICE CARD
READ OUT LOUD

You have now finished describing.

Do you want to discover more in this artwork?

- Yes. Choose a different set of cards.

- No. Choose a new artwork and start at card 1 from describing.
These blue rectangular cards provide easy drawing instructions. Drawing can help you to translate the artwork into a tactile drawing.
START

READ OUT LOUD

1. Read the tips below carefully.
   - Use the whole sheet.
   - Draw firm with the pen on the sheet.
   - Draw in a few lines.
   - Keep the drawing simple.
   - Not every detail is important.
   - Think out loud while drawing.

Go to card 1 to start drawing.
1. DRAWING OPTIONS

READ OUT LOUD

1. Choose what you want to draw together. Choose one of the following options.

• Composition in the artwork.
  → Go to card 2.

• A chosen shape (object, figure or person) from the artwork.
  → Go to card 3.

• Own interpretations of the artwork.
  → Go to card 4.
2. COMPOSITION

**Instructions for the sighted visitor.**
Grab the drawing pad, a drawing sheet and a pen.

- Use the whole sheet.
- Draw firm with the pen on the sheet.
- Draw in a few lines.
- Think out loud.

1. Draw the frame of the artwork, as large as possible, on the sheet. For example: rectangle, square, round.

2. Determine the locations of the persons, objects and / or figures. Place them clearly in the frame as simplified line drawings.

3. Let the other person feel the tactile drawing and explain what he or she feels.

Go to card 5 to continue.
3. CHOSEN SHAPE

Instructions for the sighted visitor.
Grab the drawing pad, a drawing sheet and a pen.

- Use the whole sheet.
- Draw firm with the pen on the sheet.
- Draw in a few lines.
- Think out loud.

1. Determine together which figure, object or person you will draw.

2. Draw the figure, object or person with little or no perspective.

3. Let the other person feel the tactile drawing and explain what he or she feels.

Go to card 5 to continue.
4. OWN INTERPRETATION

READ OUT LOUD

**Tip:** take a seat somewhere.

Grab the drawing pad, a drawing sheet and a pen.

- Use the whole sheet.
- Draw firm with the pen on the sheet.
- Draw in a few lines.
- Think out loud.

1. Decide together who is going to draw. Decide what to draw. Could be anything related.

2. Let the other person feel or see your masterpiece. If necessary, ask each other questions.

Go to card 5 to continue.
5. CHOICE CARD

READ OUT LOUD

You have now finished drawing.

1. Do you want to discover more in this artwork?

   • Yes. Choose a different set of cards.

   • No. Choose a new artwork and start with card 1 from describing.
Attention! Not all details are important.
FEEL
READ OUT LOUD

These triangular yellow cards can help to make the artwork tangible.
1. Hold the material cards in the middle so you can both feel them.

2. Choose **one** of the following exercises:

- Speculate (Card 1)
- In mind (Card 2)
1. SPECULATE

1. Choose one object, figure or person from the artwork.

2. Both close your eyes and feel the materials cards. Discuss how you think the object, figure or person (for example, the clothes) would feel.

Go to card 3 to continue.
READ OUT LOUD

2. IN MIND

1. Choose **one** object, figure or person from the artwork.

2. Feel the material cards. Think **silently** how you think the object, figure or person (for example clothing) would feel. And compare.

Go to card 3 to continue.
3. CHOICE CARD

Do you want to discover more in this artwork?

- Yes. Choose a different set of cards.

- No. Choose a new artwork and start with card 1 from describing.
QUESTIONS

READ OUT LOUD

These round red cards help you to ask each other questions and exchange thoughts.
START
READ OUT LOUD

1. Decide together who will ask the questions. And choose an option:

• When you are unable to read these cards.  
  Go to the app and press on the “ask button”.

• When you are able to read these cards.  
  Go to card 1.
1. QUESTIONS
READ OUT LOUD

Use the round questionmark cards to ask each other questions.

Tip: Pick a card randomly, let the cards surprise you.

Go to card 2 when you are done with asking questions.
2. CHOICE CARD
READ OUT LOUD

Do you want to discover more in this artwork?

- Yes. Choose a different set of cards.

- No. Choose a new artwork and start with card 1 from describing.
Which area of the artwork is most important to you? And why?
Which part of the artwork do you like least? And why?
What does this artwork remind you of? Why?
Is there something you found strange about this artwork?
Which emotions does this artwork evoke in you?
Is there anything mysterious about this artwork in your opinion?
If this artwork had sound effects, what would they sound like?
What do you think is missing in this artwork?
If this artwork were music, what would it sound like?
If this artwork could dance, what song would it dance to?
If you could ask the artist a question, what would you ask him/her?
What do you think the artist is trying to say?
How do you think the artist was feeling when he created this artwork?
What title would you give this artwork?
What would it feel like to be in this artwork?
How do you personally relate to this artwork?
What do you want to remember about this artwork?
What do you want to forget about this artwork?
Who do you know that would really appreciate this artwork? Why would they like it?
What does this artwork teach us about the past?
If you could ask this artwork a question, what would you ask it?
If you could change this artwork, how would you change it? Why?
MIMIC THE ARTWORK

READ OUT LOUD

These multi-sided pink cards can help you to mimic the artwork.
START
READ OUT LOUD

1. Chose one of the following options:

- Put in position.  
  Go to card 1.

- Mimic.  
  Go to card 2.
1. **PUT IN POSITION**

READ OUT LOUD

1. Choose **one** object, figure or person from the artwork, to put the other in that position.

2. Discuss the effect together.

Go to card 3 to continue.
2. MIMIC
READ OUT LOUD

1. Choose one object, figure or person from the artwork to mimic.

2. Let the other person feel your position, posture or hands.

Tip: You can also only your hands to form shapes.

Go to card 3 to continue.
3. CHOICE CARD

Do you want to discover more in this artwork?

• Yes. Choose a different set of cards.

• No. Choose a new artwork and start with card 1 from describing.
Appendix 25: The toolkit in Dutch

Componenten
Handleiding
Beschrijven Kaarten
Tekenen Kaarten
Voelen Kaarten
Vragen Kaarten
Uitbeelden Kaarten

Audio instructies in de app:

Hoi en welkom bij de instructies van de Eye cant see art toolkit.
Deze toolkit kan jullie helpen om samen naar een willekeurig museum te gaan en kunst op een gelijkwaardige manier te ervaren.

Door de stappen op de kaarten goed te volgen en zorgvuldig uit te voeren, kunnen jullie op een gelijkwaardige manier tot een discussie of conversatie komen over de kunstwerken.

Het is belangrijk dat jullie de stappen nauwkeurig volgen om het spel een beetje te leren kennen.

Het spel begint altijd met de vierkante groene kaarten waarbij de ziende bezoeker aan de visueel beperkte bezoeker uitleg wat hij of zij letterlijk ziet.

Let op! Het gaat erom dat dit zo feitelijk mogelijk gebeurt. Een voorbeeld hiervan is: “In het schilderij zie ik een man met een glimlach op zijn gezicht” in plaats van “Ik zie een blije man”. OF “In de foto zie ik 4 jongens in een groepje bij elkaar op een bankje.” in plaats van “in de foto zie ik een paar hangjonger die niks doen.”
Vermijd dus eigen interpretaties. Blijf bij feiten.

Zodra de stappen op de groene kaarten volbracht zijn, is het tijd om samen te speculeren en te fantaseren over het kunstwerk. Hiervoor kan je de andere kaarten gebruiken: De blauwe rechthoekige kaarten voor tekenen, waarbij je een tactiele tekening kan maken van het kunstwerk; De gele driehoekige kaarten voor voelen, waarbij een materialen waaier met stoffen jullie kan helpen het kunstwerk tastbaar te maken; De rode ronde kaarten voor inspiratie om kritische vragen en emotionele vragen aan elkaar te stellen; en de zeshoekige roze kaarten om figuren, objecten of personen uit te beelden. Voor deze kaarten geld ook om de stappen zorgvuldig uit te voeren, maar hier zijn jullie iets vrijer in. Het belangrijkste hier is om elkaar te betrekken. Doe het samen.

Als jullie klaar zijn met het ontdekken van een kunstwerk, kunnen jullie ook nog de app gebruiken om extra achtergrond informatie te krijgen over het kunstwerk. Scan het kunstwerk en beluister het verhaal van het kunstobject of de kunstenaar.

Vertrouw het proces, zo leren jullie gaande weg om het meeste uit jullie museum bezoek te halen. Veel plezier en geniet van jullie kunstervaring met de toolkit!
Een educatief kaartenset om samen kunst te ontdekken in musea. Geschikt voor ziende en visueel beperkte kunstliefhebbers.

Download de app voor meer.
Deze toolkit dient als hulpmiddel voor ziende en visueel beperkte museum bezoekers, om samen kunst te ervaren in musea.

Door de stappen op de vierkante groene kaarten zorgvuldig te volgen en uit te voeren, kan de ziende bezoeker kunstwerken op een objectieve manier aan de visueel beperkte bezoeker overbrengen.

De visueel beperkte bezoeker kan hierdoor het kunstwerk op een gelijkwaardige manier, zonder interpretaties van de ziende bezoeker, beleven.

Het doel is om daarna samen te kunnen speculeren, fantaseren, discussiëren en interpreteren over het kunstwerk op een gelijkwaardige manier.

Inhoud:
5 x set kaarten, ieder van een ander thema.
Een tekenpad, tactiel papier en een pen.
www.eyecan(t)seeart.com
HANDLEIDING

Lees de handleiding door voor dat jullie naar het museum gaan en download de App “eye can(t) see art”.
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DOEL
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BESCHRIJVEN  TEKENEN  VOELEN  VRAGEN  UITBEELDEN
HOE WERKT HET?

STAP 1:
KIES EEN KUNSTWERK UIT. START MET DE GROENE KAARTEN VAN HET THEMA “BESCHRIJVEN”.

BESCHRIJVEN

STAP 2:

OPTIE 1: GENOEG VAN DIT KUNSTWERK? KIES EEN ANDER KUNSTWERK EN BEGIN OPNIEUW MET BESCHRIJVEN.

OPTIE 2: MEER WETEN OVER DIT KUNSTWERK? KIES EEN VAN DE ANDERE SET KAARTEN OM ER DIEPER OP IN TE GAAN.

TEKENEN  VOELEN  VRAGEN  UITBEELDEN

STAP 3: OPTIONEEL
SCAN HET KUNSTWERK MET DE APP. ONTDEK EXTRA ACHTERGROND INFORMATIE VAN HET MUSEUM OVER HET KUNSTWERK.
INSTRUCTIES OM TE ONTHOUDEN

De volgende instructies helpen jullie om de toolkit goed uit te voeren.

Door onderstaande punten goed toe te passen, is het effect van de toolkit optimaal.

• Lees de kaarten altijd hardop.

• Wijk niet af van de stappen.

• Voer de stappen op de kaarten zorgvuldig uit.

• Vertrouw het process.

• Doe het samen.
BESCHRIJVEN
LEES DE KAARTEN HARDOP

Deze vierkante groene kaarten geven eenvoudige instructies voor de ziende bezoeker om het kunstwerk objectief te beschrijven aan de visueel beperkte bezoeker.
1. Kies een kunstwerk uit.

2. Lees de onderstaande basis regels goed door om objectief te kunnen beschrijven.
   - Kijk goed.
   - Blijf bij feiten.
   - Beschrijf zonder emotie.
   - Vermijd eigen interpretaties.

Ga naar kaart 1 om te starten met beschrijven.
1. EERSTE IMPRESSIE

1. Ik zie een .. (schilderij, foto, tekening, prent).

2. Het kunstwerk is:
   • Liggend georiënteerd
   • Staand georiënteerd
   • Anders

3. In het kunstwerk zie ik ... (Beschrijf in één zin wat er letterlijk in het kunstwerk te zien is. Blijf bij feiten.)

4. Het kunstwerk is:
   • Figuratief (ik zie herkenbare figuren)
   • Abstract (ik zie onherkenbare vormen)

5. Is het kunstwerk contrastrijk? Ja/Neen

6. Twee duidelijk aanwezige kleuren zijn ...

Spreekt het kunstwerk jullie aan?
   • Ja. Ga naar kaart 2.
   • Nee. Begin opnieuw bij een ander kunstwerk.
2. COMPOSITIE

1. Kies een heldere structuur om de compositie van het kunstwerk te beschrijven.

Beschrijf letterlijk wat je ziet. Vermijd eigen interpretaties! Wees specifiek, vermijd woorden als “hier” en “daar”.

Voorbeelden:
- Van Boven naar Beneden
- Van Links naar Rechts
- Van Voor naar Achter
- Van midden uit
- Met de Klok mee

Ga naar kaart 3 om verder te gaan.
3. GEBEURTENISSEN

1. Kies samen één gebeurtenis/onderdeel in het kunstwerk en beantwoord de volgende vragen: (Beschrijf letterlijk. Vermijd eigen interpretaties.)

a. Welk effect hebben de objecten, figuren en/of personen op elkaar?

b. Welke grootte hebben de objecten, figuren of personen ten opzichten van elkaar?

Tip: Herhaal stap 1 voor andere gebeurtenissen in het kunstwerk.

Ga naar kaart 4 om verder te gaan.
4. KLEUREN

1. Willen jullie kleuren beschrijven?
   • Ja. Ga naar stap 2.
   • Nee. Ga naar kaart 5.

2. Kies één object, figuur of persoon uit het kunstwerk en beschrijf welke kleur dit object, figuur of persoon heeft. (Verbind kleuren met elementen uit de natuur voor verduidelijking, zoals: citroengeel, eigeel of grasgroen.)

   **Tip:** Herhaal stap 2 voor andere objecten, figuren of personen.

   Ga naar kaart 5 om verder te gaan.
5. TECHNIEK

1. Wat voor soort kunstwerk is het?
   Schilderij, Tekening, Foto, Prent, Collage, ...

2. Welk materiaal is gebruikt?
   Doek, Papier, Glas, Stof, Hout, ...

3. Welke technieken zijn gebruikt?
   Verf, Potlood, Krijt, Inkt, Combinatie, ...

4. Welke texturen heeft het kunstwerk?
   Grof, Glad, Zacht, Ruw, Hard, ...

Ga naar kaart 6 om verder te gaan.
6. DETAILS

1. Kies samen één detail van een object, figuur of persoon uit het kunstwerk om dieper op in te gaan. (Vermijd emoties. Beschrijf wat je letterlijk ziet.)

Ga eventueel dichterbij het kunstwerk staan en beschrijf het detail.

Tip: Herhaal stap 1 voor andere details. Let op niet alle details zijn belangrijk.

Ga naar kaart 7 om verder te gaan.
Jullie zijn nu klaar met beschrijven.

1. Willen jullie meer in dit kunstwerk ontdekken?
   - Nee. Kies een nieuw kunstwerk en begin bij kaart 1.
TEKENEN
LEES HARDOP

Deze blauwe rechthoekige kaarten geven eenvoudige instructies om te tekenen.

Het tekenen kan jullie helpen om:
• het kunstwerk te vertalen naar een tactiele tekening.

OF

• eigen interpretaties te communiceren.
START

LEES HARDOP

1. Lees de onderstaande tips goed door.
   • Gebruik het hele vel.
   • Teken krachtig met de pen op het vel.
   • Teken in enkele lijnen.

   • Houd de tekening simpel.
   • Niet elk detail is belangrijk.
   • Denk hardop tijdens het tekenen.

   Ga naar kaart 1 om te beginnen met tekenen.
1. TEKEN OPTIES

LEES HARDOP


- De compositie van het kunstwerk.  
  Ga naar kaart 2.

- Een gekozen vorm (object, figuur of persoon) uit het kunstwerk.
  Ga naar kaart 3.

- Een interpretatie van het kunstwerk.
  Ga naar kaart 4.
2. COMPOSITIE

Instructies voor de ziende bezoeker.
Pak de tekenpad, een tekenvel en een pen.
- Gebruik het hele vel.
- Teken krachtig met de pen op het vel.
- Teken in enkele lijnen.
- Denk hardop.


3. Laat de tactiele tekening voelen aan de ander en leg uit wat hij of zij voelt.

Ga naar kaart 5 om verder te gaan.
3. GEKOZEN VORM

Instructies voor de ziende bezoeker.
Pak de tekenpad, een tekenvel en een pen.
- Gebruik het hele vel.
- Teken krachtig met de pen op het vel.
- Teken in enkele lijnen.
- Laat lijnen sluiten.
- Denk hardop.

1. Bepaal samen welk figuur, object of persoon je gaat tekenen.

2. Teken het figuur, object of persoon met weinig of geen perspectief.

3. Laat de tactiele tekening voelen aan de ander en leg uit wat hij of zij voelt.

Ga naar kaart 5 om verder te gaan.
4. EIGEN INTERPRETATIE

LEES HARDOP

Tip: neem ergens plaats om te gaan zitten.

Pak de tekenpad, een tekenvel en een pen.
- Gebruik het hele vel.
- Teken krachtig met de pen op het vel.
- Teken in enkele lijnen.
- Denk hardop.


2. Laat de ander je meesterwerk voelen of zien. Stel elkaar eventueel vragen.

Ga naar kaart 5 om verder te gaan.
5. KEUZE KAART

LEES HARDOP

Jullie zijn nu klaar met tekenen.

1. Willen jullie meer in dit kunstwerk ontdekken?

   • Ja. Kies een andere set themakaarten.

   • Nee. Kies een nieuw kunstwerk en begin bij kaart 1.
VOORBEELD KAART

DETAILS TEKENEN

Let op! Niet alle details zijn belangrijk.
VOORBEELD KAART
COMPOSITIE & VORMEN TEKENEN
VOELEN

LEES HARDOP

Deze driehoekige gele kaarten kunnen jullie helpen om het kunstwerk tastbaar te maken.
LEES HARDOP

START

1. Houd de materialenkaarten in het midden, zodat jullie deze beiden kunnen voelen.

2. Kies één van de volgende opdrachtkaarten:
   - Speculeren (Kaart 1)
   - In gedachte (Kaart 2)
LEES HARDOP

1. **SPECULEREN**

1. Kies **één** object, figuur of persoon uit het kunstwerk.

2. Sluit beide jullie ogen, voel aan de materialen-kaarten en bespreek hoe het object, figuur of persoon (bijvoorbeeld de kleding) volgens jullie zou voelen.

Ga naar kaart 3 om verder te gaan.
2. IN GEDACHTE

1. Kies één object, figuur of persoon uit het kunstwerk.


○ Ga naar kaart 3 om verder te gaan.
3. KEUZE KAART

Willen jullie meer in dit kunstwerk ontdekken?

- Nee. Kies een nieuw kunstwerk en begin bij kaart 1.
VRAGEN
OVER KUNST

LEES HARDOP
Deze rode ronde kaarten helpen jullie om elkaar vragen te stellen en gedachten uit te wisselen.
START
LEES HARDOP

1. Bepaal samen wie de vragen gaat stellen. En kies een optie:

• Wanneer je niet in staat bent om deze kaarten te lezen.
  Ga naar de app en druk op de “vragen-knop”.

• Wanneer je wel in staat bent om deze kaarten te lezen.
  Ga naar kaart 1.
1. VRAGEN
LEES HARDOP

Gebruik de ronde vragenkaarten om omstebbeurt vragen te stellen.

Tip: Pak willekeurig een kaart, laat je verrassen door de vraag.

Ga naar kaart 2 als jullie klaar zijn.
2. KEUZE KAART

LEES HARDOP

Willen jullie meer in dit kunstwerk ontdekken?

• Ja. Kies een andere set themakaarten.

• Nee. Kies een nieuw kunstwerk en begin bij kaart 1.
Welk onderdeel van het kunstwerk spreekt je het meeste aan? En waarom?
Welk onderdeel van het kunstwerk spreekt je het minste aan? En waarom?
Welke herinnering roept het kunstwerk bij je op?
Is er iets dat jij vreemd vindt aan dit kunstwerk?
Welke emoties roept dit kunstwerk bij je op?
Is er iets mysterieus aan dit kunstwerk volgens jou?
Als dit kunstwerk geluidseffecten zou hebben, hoe zouden deze dan klinken?
Wat ontbreekt er volgens jou in dit kunstwerk?
Als dit kunstwerk muziek zou zijn, hoe zou het dan klinken?
Als dit kunstwerk kon dansen, op welk nummer zou het dan dansen?
Als je de kunstenaar een vraag kon stellen, wat zou je dan aan hem of haar vragen?
Wat denk je dat de kunstenaar probeert te zeggen?
Hoe denk je dat de kunstenaar zich voelde toen hij dit kunstwerk maakte?
Welke titel zou jij dit kunstwerk geven?
Hoe zou het voelen om in dit kunstwerk te staan?
Hoe verhoudt jij je persoonlijk tot dit kunstwerk?
Wat wil je onthouden van dit kunstwerk?
Wat zou je willen vergeten van dit kunstwerk?
Wie uit jouw omgeving zou dit kunstwerk waarderen? En waarom?
Wat leert dit kunstwerk ons over het verleden?
Als je dit kunstwerk een vraag zou kunnen stellen, wat zou je het dan stellen?
Is er iets wat je zou veranderen aan het kunstwerk?
KUNST
UITBEELDEN
LEES HARDOP

Deze roze zeshoekige kaarten helpen jullie om het kunstwerk uit te beelden.
START
LEES HARDOP

1. Kies **één** van de volgende opties.

- In positie zetten.
  Ga naar kaart 1.

- Uitbeelden.
  Ga naar kaart 2.
1. IN POSITIE ZETTEN
LEES HARDOP

1. Kies één object, figuur of persoon uit het kunstwerk, om de ander in die positie te zetten.

2. Overleg samen het effect.

Ga naar kaart 3 om verder te gaan.
2. ZELF UITBEELDEN

LEES HARDOP

1. Kies één object, figuur of persoon uit het kunstwerk, om deze uit te beelden.

2. Laat de ander je positie voelen.

Tip: Voor vormen kun je ook alleen je handen gebruiken.

Ga naar kaart 3 om verder te gaan.
3. KEUZE KAART

Willen jullie meer in dit kunstwerk ontdekken?

• Ja. Kies een andere set themakaarten.

• Nee. Kies een nieuw kunstwerk en begin bij kaart 1.