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0. Original project Brief

DESIGN
FOR our
future



IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according to the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name
initials given name
student number
street & no.
zipcode & city
country
phone
email

Your master programme (only select the options that apply to you):

IDE master(s): ☐ IPD ☒ Dfl ☐ SPD

2nd non-IDE master:

individual programme: (give date of approval)

honours programme: ☐ Honours Programme Master

specialisation / annotation: ☐ Medisign

☐ Tech. in Sustainable Design

☐ Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair Vermeeren, A.P.O.S. dept. / section: HICD
** mentor Elkhuisen, W. S. dept. / section: MD
2nd mentor
organisation:
city: country:
comments
(optional)
|
|
|

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..



! Second mentor only applies in case the assignment is hosted by an external organisation.



! Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Vermeeren, A.P.O.S. date 20 - 02 - 2018 signature _____**CHECK STUDY PROGRESS**

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC
 Of which, taking the conditional requirements into account, can be part of the exam programme _____ EC

List of electives obtained before the third semester without approval of the BoE

☒ YES all 1st year master courses passed

☐ NO missing 1st year master courses are:

name _____ date ____ - ____ - ____ signature _____

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks?
- Does the composition of the supervisory team comply with the regulations and fit the assignment?

Content: ☐ APPROVED ☐ NOT APPROVEDProcedure: ☐ APPROVED ☐ NOT APPROVED

comments

name _____ date ____ - ____ - ____ signature _____

A multi-sensory art experience for visually impaired museum visitors project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 13 - 02 - 2018

26 - 11 - 2018

end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

In December 2006, the United Nations agreed on the convention on the rights of persons with disabilities [1]. In 2016, this convention has become in force in the Netherlands as well. According to article 9, accessibility, this means that people with a handicap should be able to take part in all facets in life. This includes visiting museums as well. Since many museums cover visual arts like paintings and historical objects which can't be touched, they aren't accessible for visually impaired. 3D printed reproductions can offer a solution here. Currently, these reproductions are similar to the original in surface texture and color and allow for touching, which can provide for a whole new experience.

Some effort has been undertaken to use 3D prints in a museum context as is done in the Prado museum in Madrid. [2] The Louvre, New York's Metropolitan Museum of Art and London's national gallery have touch-friendly programs as well, even though without the use of 3D prints.

The graduation project is related to the PhD research project '3D Fine Art Reproduction', with the Design Engineering Department (IDE). Here, previous graduation projects, Smartframe [3] and Smartframe 2.0 [4], combined these 3D printed paintings with capacitive touch, guided illumination and sound to enrich the art experience of sighted visitors. This project is carried out in the MuseumFutures lab, which focuses on applying novel technologies for creating more relevant museum experiences. The project is done in partnership with the Rijksmuseum, as they undertake ongoing efforts to provide better access and experiences to blind and visually impaired visitors. Therefore, they have shown interest in exploring the possibilities of using 3D printed reproductions of paintings (and other objects) for this purpose, to enrich guided tours and/or exhibitions, but which preferably also add a new layer for their sighted visitors.

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introduction (continued): space for images



image / figure 1: A visitor touching a 3D replica of the Mona Lisa at the Prado, Madrid [2]



image / figure 2: Render of the SmartFrame [3]

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

One of the main goals of museums is providing access to artwork. When going through a museum, not every visitor can have the same experience. Especially having a visual impairment is a hurdle for certain museum visitors, since touching paintings and other objects is not allowed and the light levels are low to protect the artwork from degradation. This makes perceiving the art difficult for people with little eyesight as well. Furthermore, they are often depending on others, while independence is important for many visually impaired. Even though we can touch 3D printed reproductions, just touching a painting won't provide the visually impaired person with the full artwork experience. In short the problem is: How can a museum provide an interesting multi-sense experience to the visually impaired.

This project will focus on paintings. One of these will be used to make a functional prototype. At the end, an analysis will be done to transfer the knowledge towards historical objects as well.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

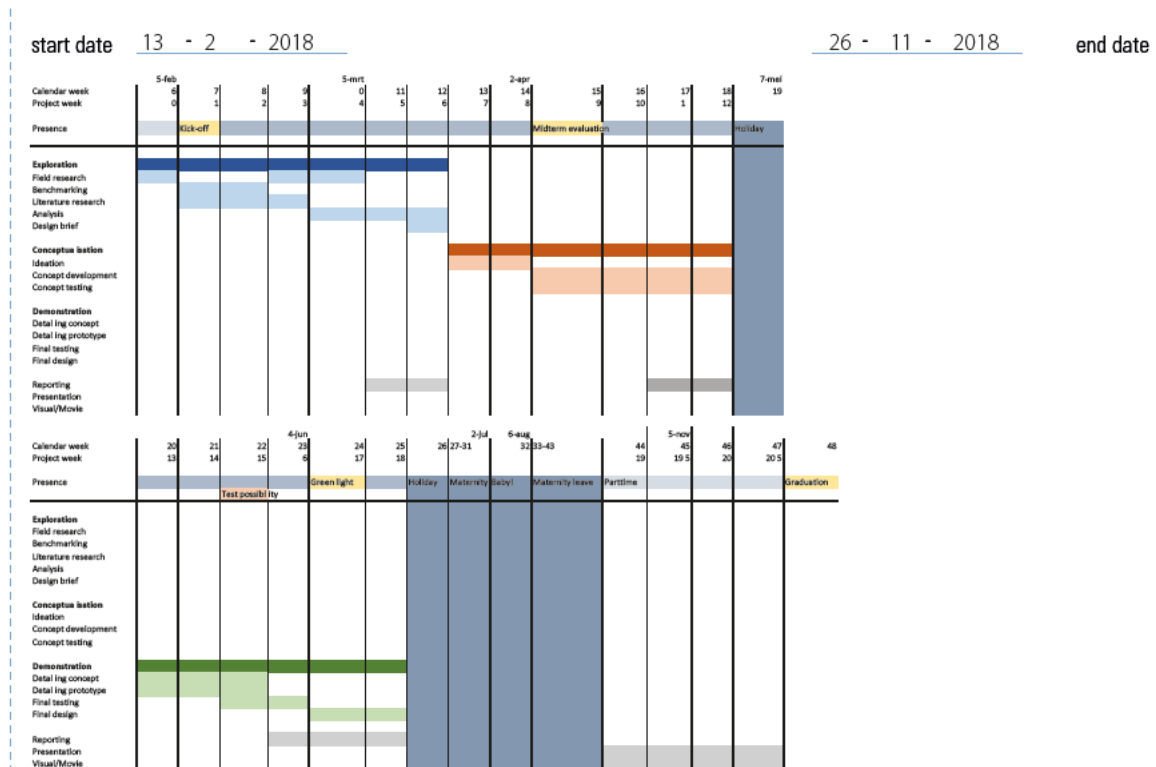
Design a product that enables museum visitors, with different levels of visual impairment, to experience visual art in an engaging, rich and independent way, making use of 3D printed replicas.

Deliverables:

An interactive, functional prototype, incorporating 3D prints
Visualizations of the final design (storyboard/video)
Insight cards for sharing knowledge connected to the project
Graduation Report

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.



I'm expecting a baby at August 9. Therefore I will take six weeks before and ten weeks after as maternity leave. Afterwards, I will be working parttime (two and a half day) for four weeks.

Exploration: The goal is to find out what visually impaired museum visitors can get out of the intended experience.

*Field and literature research, like interviews and observations, to explore

- how visually impaired experience the world, how this differs from ours and the differences within the group of visually impaired (like difference in being blind by birth or after and blind or ill-sighted).

- how visually non-impaired museum visitors experience art and what they are looking for.

*Explore - the current practices of museums to provide for the visually impaired and their insights.

- how the other senses are exploited.

- which technologies are available and interesting to incorporate.

- The commonalities and differences in museum experience regarding to historical artefacts and paintings.

Idea generation/concept design

Ideation on my own and/or in a group (creative session) using the insights discovered from the exploration phase.

Transforming these ideas into 1-3 concepts, while choosing either the artefact or the painting.

Creating low fi prototypes for the concepts to be tested in an early stage, to provide for an iterative design process.

Demonstration

Finalizing the concept with the feedback from the phase before.

Translating this concept into a working prototype and testing this prototype with the user.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

Why this project

The main reason for me to start this project is the relation to art combined with a, for me, unknown usergroup. Art has always been a great interest of mine and I believe that making this accessible for other user groups is both meaningful and even necessary. Moreover it is an upcoming area, so there is a public interest and still much to be gained.

Manage required knowledge effectively

Already I have many directions to do research upon. I want to learn how to prioritize in this and use my gained knowledge of the past year and a half on structuring and analyzing this information in an efficient way. I would like to do research through different channels, (like structured versus non-structured interviews, observations in a certain situation etc.) and compare these.

Justify choices

Since I spent the last two and a half years immersing myself into interaction design, the experience of the user has to be central within my project and end result. When doing my bachelor, I didn't have a lot of knowledge about methodologies and approaches, so I want to prove that I learned a more scientific way of running a project. For instance, I want to recruit a diverse set of users from my actual user group instead of people who are easily available, learn how to do expert interviews for I have mostly done user interviews, create a userflow through the museum (current and envisioned) and work visual, like drawing my problem etcetera. Also, when reporting I want to work visual from the beginning, like mindmapping the findings and establishing hierarchy to create a clear image for the reader and myself.

Challenging user

For me it is a challenge to work not primarily focussed on the visual sense, for this is the most common sense I used in my previous projects, but explore the other senses as well and incorporate them. I have worked with user groups I wasn't familiar with before, but in my designs the visual sense was always one that was mostly addressed. I have worked with sound before, but diving into touch is new for me.

Prototype

That the visual sense isn't my main focus will have to be clear within my final concept and prototype. It has been two years since I last built a technical prototype, so I will reboost skills like arduino and making a technical drawing. I've already worked with Ultimaker 3D printers during my internship, but also want to learn the basics of using the 3D printer that is used for the paintings and be able to modify the paintings myself (in case I want to increase/decrease relief).

Project management

I have done my bachelor in Eindhoven where every semester existed out of a project (first in a group and later individual) and some side courses. I used to have difficulties with choosing directions and asking for help. This was two years ago and in this graduation project I want to show that I've become more assertive and certain in planning and executing an individual project. I will make a planning every week and have an agenda ready for the meetings.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

A1. Expert interview questions

As the interviewees were all Dutch native speakers, the interviews were held in Dutch as well. Not all the questions were asked exactly like that, but the three topics were always present within the tours.

Vragen voor Experts met museum tours

(Van Leeuwen, Hartjes, van Uffelen, Greving, van Helbergen)

Achtergrond

Waarom en hoe ben je begonnen met het ontwerpen van een ervaring voor blinden en slechtzienden?

Hoe zijn de tours (/expositie) ontstaan?

Doelgroep

Hoe krijg je een kijkje in de belevingswereld van blinden/slechtzienden?

Hoe anders is die belevingswereld? Op wat voor manier?

Wat willen zij graag uit een museumbezoek halen? (sociaal, zelfstandig, verdiepende kunstbeleving)

Wat is precies de doelgroep/wie proberen jullie aan te trekken of komen erop af? (Komen mensen die normaal niet zo veel doen nu ook bijvoorbeeld?)

Tour (/expositie)

Hoe zit de rondleiding in elkaar?

Welke onverwachte ontdekkingen heb je gedaan?

Wat werkte echt totaal niet? En wat verrassend genoeg wel?

Heb je ook gekeken naar 3D geprinte schilderijen? Waarom wel/niet gekozen?

Een groep blinden/slechtzienden kan nog steeds heel divers zijn qua niveau, hoe zorg je ervoor dat het voor iedereen interessant is?

Voelen duurt langer dan kijken en kan door minder personen tegelijk gedaan worden, hoe los je dit op?

Other experts

(In't Veld, Voorn, Kal, Alette)

The common denominator of these experts was their experience with people with a visual impairment, so most of the questions were focussed on that. Besides, the questions were adjusted to their expertise: tactile drawings, rehabilitation, leisure and auditory transcriptions.

A2. Expert interview results

The interviews were held in Dutch and translated to English afterwards.

Willemijn van Helbergen 17/2/18

Museum van Loon, tours at the first Sunday evening of the month

The size of the group is maximum seven visually impaired

They want to be taken through the museum like every other visitor. The tour is on a separate day, because a lot of other people around doesn't work. People have to pass by, but for visually impaired it is difficult to notice them.

The test panel all think that there isn't a lot for visually impaired in museums yet.

They start off with coffee in a separate room. There they do around of who sees how much and who needs what kind of help (stairs). It's important to give reasons for these questions.

The tour is about the building, it's residents and paintings. It is basically a normal tour with other senses: hearing, touch, smell (garden). Taste didn't fit well. The story is the same as well, but in a different way. She starts with describing the current situation/surroundings.

When someone is born blind, 2D is difficult to imagine. Therefore, she uses fabrics, lemons, a chair, glass and other objects from the painting. The more authentic, the better (C&D objects). She asks: What do you have in your hands? Why do you think this is on the painting?

She also wants to remake the weapon, for it is now on small items which can't be felt. Furthermore, she lets them feel anything that can be felt, like stairs and ornaments on the wall. Last, it would be nice if the visitors could try on the coats etcetera in the old style.

Also only blind people use braille.

For the tour to remain interesting, she would like to change it every year. Then they can come another time for a new story and theme. For instance dining in the dining room would be awesome.

She does four artworks in one hour, because you don't move easily with a group and describing very literally takes a lot of time. Also, it is an intensive experience, so four highlights will do.

According to Cathelijne, a tour is an easy start. Willemijn: An audio tour closes off from the outside.

Also nice is to let the group take positions of the painting (van Abbe) or use a different artform.

Marleen Hartjes 20/2

Studio i and van Abbemuseum

Started a couple of years ago with the tours. She has tried and researched a lot, also with visually impaired who studied art history. Furthermore she went to many other museums in Europe.

She also spoke a lot with people from blind education.

Realize your target audience. Early blind people do not have a visual memory. They imagine special objects, so do not have a 2D image. For them, she takes objects out of the painting to feel in 3D. Not many people have been blind from birth or a young age, so most of the people do have a visual memory.

Many tools do not fit. For instance touch replicas have to be developed well.

They use swell paper

Leave a bit of space when a line touches another line. Don't make the filling graphical (for instance stripes). Dots close to each other is alright.

Often she uses multiple replicas, going from large to detailed. Less is more: For faces she only uses contours.

According to one on one painting reproductions: The paint structure is still there, which isn't really useful. Also it feels very plastic. Van Gogh museum printed integral stripes, which is fun for sighted people only.

The print company Epson stacks ink, that might work better.

What is nice about Prado is that certain parts are made tangible. This does have to be done well.

They do have a couple of 3D printed objects (small & finished) and a replica of the building.

There are many ways to convey an artwork. Touch is most important, but there are boundaries.

When approaching an original artwork, let them touch it themselves first, then describe.

When describing: go from the whole to the details. Also, work from the outside towards the inside

Talk about the

- format,
 - materials,
 - image
 - o Direct: let them feel velvet. Associative: big belly in a bag
 - Technique
 - Atmosphere
 - o Smell and taste
 - * Direct: flowers, lemons etc.
 - * Indirect: associative scents, for instance popcorn and candy floss for a fair
 - o Music
 - * Atmosphere, from that time, inspiration for the artist
 - o Poetry and literature
 - o Theatre and dance
 - * Performers who stand in a certain position, which people can feel. This evokes a lot of emotions and recognition
 - * Let the people take the position themselves. How does that feel?
- Every art piece needs a different approach. Often they use multiple tools.

Elvera van Leeuwen 21/2

Mikxs and works with Boijmans

Started with both deaf and blind, but specialized. Developed tours and took it to Boijmans.
The museum world is very small. Most people know each other.

Delve into the differences: Early or late blind, the latter do have visual memory.

The technique of Jofke is interesting, but complicated because you need to learn her technique.

For the tours, they do max. 4 people per group and four pilots. People think it's nice, but remain critical. For some of them, it is a revelation. They did not expect much.

Van Gogh museum has the same tour over and over, they want to do st. different every time.

The target group is very diverse. Some are enthusiastic about 3D prints, while for others they are too large and complicated.

Tactile drawings are often unknown by the audience. A schematic build-up is fine, but figures become too complicated.

It's about the total picture and attributes. Attributes are used for symbols (shoe, rabbit paw).

Objects need not to be too large, for then there is no beginning and endpoint anymore. This is particularly hard for a ball for instance, because it's round.

Other senses need to add something to the artwork. Not: "This is how cheese and sausage smells", cause they know. It has to add to the background ("Imagine how the artist sat there painting in the smell") or message.

Colors are subjective as well. For late blind people, they can add something.

They start in a separate room. The tours are on normal visiting hours: inclusion, between people.

It's also about training the guides and give them a new/different way of thinking.

They thought about separating blind people and people with low vision, but they help each other. Never just ask: What can you see? Always let them know why you are asking something like that.

They also thought about separating on knowledge level, but how are you going to measure? It's better not to separate.

They like to discuss and ask a lot of questions.

If they would be independent when going through the museum, how would they do this? How would they know where to go and what can be touched?

They do not use 3D prints, because the conservators are scared. Also money is a problem.

Karel Appels "The man with the donkey" would be perfect, because it is on wood and has a bucket.

Belgium has an integrated museum. Television program: "Blind naar de top"

Marjolein Kal 23/2

Museum4All

Her graduation was on inclusivity of people with a visual impairment. Next to her job she pursued this and co-created the website. The website gives museum information to visually impaired.

Ill-sighted people do not necessarily want to feel. They can focus on a small spot. Often they look better and longer (also depending with whom they are). Therefore, a couple of objects is enough.

It's also about the distance from a painting. Further distance isn't always possible.

People with low vision are often more independent.

Museums learn from each other, build on each other's expertise. There is a lot of knowledge, but it isn't bundled well.

Van Abbe is doing well, but has special days.

It's not only about the art itself, also the building needs adaptations. For better visibility, you need more light and more contrast (!).

Galleries are often more light, where historical museums are often dark and noisy.

Museu Nacional do Azulejo in Lisbon has relief tiles. These are build up from one, to four with only the outer elements, to a whole of 3 by 3. This way, the information is build up and the repetitive elements are shown, also interesting for people who can see. This is done the same for every room, which makes it easier to understand and to find.

Also London and Madrid are doing quite okay.

There hasn't been done much for visually impaired children.

People want to get out of museum visits exactly the same as we want to get out of it:

A day out, seeing something new, have an experience, share this with a friend.

Germa Greving 23/2

Pakhuis Ermelo (Heritage, nature, environment)

Ermelo is a caring village. The museum wanted to fit this. This does cost money, while it is a small target group, so it is really a choice. The museum wanted to be inclusive, so this is taken into account when building already. There aren't doorsteps etc. and the floor is flat.

Recently they created a new exhibition. They already do a lot with experience. For this they added for instance Braille (created by the Christelijke blinden bieb). To make the braille work, the texts had to be shortened dramatically.

Once a month they offer tours for visually impaired. The pilot was in autumn. It is a small museum, which makes these tours easier. The tours are on normal visiting hours, only on a time where it isn't that crowded. The group exists out of maximum ten people, with two guides from the group and two from the museum.

They both use reproductions and real objects from the C-collection.

They try to translate image into object. They have or describe clothes or attributes.

Also they provide lenses, so people can come close.

The reactions are positive, also by other people who think it's good that there is attention for these kinds of groups. People even come back during normal hours, because there is so much to discover.

What was notable for her is that when someone from the group reads Braille, they often read out loud. This isn't very handy. Also, not everyone can deal with the same text at the same time.

Therefore, she leaves the group free to go at certain moments.

Often, the story has to be adjusted to the group.

Harma van Uffelen 7/3/18

Educator Van Gogh museum, van Gogh op gevoel

Begonnen met replica's (relievo's) voor de verkoop. Wilden ook al langer iets met de doelgroep doen, bleek goede match. De essentie van Van Gogh is zijn expressieve verfstreek. Deze is goed voelbaar.

In samenwerking met de doelgroep is het programma ontwikkeld en er zijn verschillende pilotsessies gedaan. Er worden nu zo'n drie jaar rondleidingen gegeven. Elke maand op zaterdagochtend vroeg (relatief rustig) is er zo'n rondleiding. De groep bestaat uit maximaal twaalf mensen (6 met een visuele beperking en 6 begeleiding). De sessies zijn speciaal ontwikkeld om samen te beleven, maar er komen ook mensen alleen. Een groep kan ook zelf een rondleiding aanvragen.

Dit duurt twee uur: Het eerste uur bestaat uit een rondleiding op zaal. De rondleiders zijn speciaal getraind, in samenwerking met V&A in Engeland. Daarna een uur workshop. Hiervoor zijn vier schilderijen beschikbaar, ze doen er twee per persoon. Tijdens de workshop worden ze opgesplitst in twee groepen voor meer persoonlijke aandacht.

De rondleiding op zaal is erg belangrijk voor de deelnemers. Ze willen graag onderdeel zijn van de museumbezoekers. Andere bezoekers zijn erg begripvol en vinden het leuk. Logistiek op zaal is wel lastig, net als met de groep er doorheen lopen.

Het is belangrijk om de hele organisatie mee te nemen. Daarvoor worden trainingen georganiseerd. Zo raken ook de beveiligers etc. gewend aan mensen die dicht op de tekeningen staan en/of honden bij hebben.

De workshops geven vooral verdieping. Ze beginnen met koffie/thee en kunnen ervaringen uitwisselen. De geprinte schilderijen zijn gekozen op hun voelbare, dikke verfstreek. Hierdoor is de techniek goed over te brengen. De deelnemers voelen zelf of samen met hun begeleider aan het schilderij. Ze krijgen uitleg over waar ze voelen. De voorstelling is echter lastig over te brengen via de relievo's. Dat gebeurt onder andere door middel van reliëftekeningen, zijn brieven, uitleg, geur, muziek en 3D objecten. Dan krijg je naast alleen 'wat' ook meer 'waarom', waarmee je steeds een laagje dieper gaat.

Bij de uitleg beginnen ze vaak met de titel, dan wat je ziet en de sfeer (bijvoorbeeld warme kleuren, avondlicht etc.). Een schilderij beschrijven duurt lang. Geur is bijvoorbeeld nat gras bij 'Korenveld onder onweerslucht' of bloemengeur bij 'de Zonnebloemen'. Verder de geur van tabak, drank die hij vaak dronk of olieverf. Bij 'de Zonnebloemen' is een speciaal muziekstuk ontwikkeld. Verder is de vaas aanwezig van 'de Zonnebloemen', net als echte zonnebloemen om een beeld te krijgen van of zoveel bloemen wel mogelijk zijn in zo'n vaas en de verschillende structuren erop. Verder is er nog een maquette van 'de Slaapkamer', deze werkt

erg goed.

Voeltekeningen zijn snel ingewikkeld. Ze werken wel heel goed om de verschillende onderdelen en structuren te voelen. Verder zijn de voeltekeningen niet voor iedereen. Dat geldt eigenlijk voor alle onderdelen, vandaar dat ze veel keuze hebben. De workshops mogen nog wat gestroomlijnder.

Het leuke is dat de persoon en de begeleider sámen dezelfde ervaring hebben. Daar krijgen ze ook veel reacties over, dat het fijn is dat zij ook mee kunnen doen. De meeste interactie gebeurt daardoor tussen de persoon en begeleider. Er ontstaat vaak ook wel groepsdiscussie. Bij doven/slechthorenden is dat meer, zij zijn een hechte gemeenschap, ook omdat ze een aparte taal spreken. Er is veel verschil binnen de groep. Laatblinden zijn makkelijker mee te nemen in een verhaal, vanwege hun visuele geheugen. Vroeg blinden daarentegen hebben niets aan uitleg als 'warme kleuren'. Het is een hele kleine doelgroep, maar dat maakt het wel lastig voor hen. Slechtzienenden willen inderdaad graag van dichtbij kijken. Dat kan gelukkig bij de relievo's.

Workshop Dedicon tactile drawings – Dorine in't Veld 16/3/18

Product manager and tactile learning/reading

Dedicon works with grants. Therefore not everyone can get their work immediately.

They make about 50.000 drawings a year, 17.000 new ones. Mostly for schools and blind people library.

Tactile drawings are basically drawings that can be felt. They use two techniques:

- Swell paper in combination with carbon ink
- Thermoform (mould with vacuum forming)

The Swell paper is often used for children to help them forming concepts. It's hard to feel a difference between horizontal and vertical shading. Dots work better. It's also good to keep white in the drawing, especially where lines intersect.

Perspective is particularly difficult. One should make different views. For people blind from birth, this technique should be taught, because they have no idea of what a 2D image looks like. They only have an idea of 3D, so have to learn what a drawing is: a projection, outline.

When you are holding a 3D object, you feel multiple views at the same time.

Thermoform is used for floor plans among other things. These take time and explanation to understand. Otherwise it's hard to get any information of it. The mould is made through elevated printing by Océ.

Why use 2D drawings for visually impaired?

These drawings clarify the position in space. Also, some objects or ideas are too large/small/abstract or simply not available. Also scale models are more unclear than one might think. Not every part is reachable, they are expensive and can't always be bought. Last, when using more senses (multi modal), the information sticks more thoroughly.

Any tactile drawing needs explanation! It's a good idea to build up the drawing.

Tip for museums: When there is cheese on a painting, you don't necessarily let them smell this, unless it has a meaning behind it.

Talk with Dorine afterwards

People who are visually impaired from birth and have followed lessons in how to use raised line drawings is a small target group. The technique used to be out of favour for a while.

80% of the people who are blind still sees something. Also some people see more in the morning than in the evening etc. For people with some vision, the drawings can work supporting.

Visual memory fades.

Richa Gupta does research in India about raised graphics.

Andreas Reichiner (?) developed software for the height of folds in clothing.

What's could be improved at an existing tour:

They use ten masterpieces in their tour. This is the agenda of the museum. It would be better to use themes. Also, when using a raised line drawing, someone should know how to use this in the story. For instance the drawing for 'Heads full of clouds' from Dali was made to explain the proportions of three elements above each other in the painting. This was misused in the story.

There is too little reflection upon what is clear for people with a visual impairment.

It's nice to feel paint, it explains the technique, but it doesn't explain the image or composition. One needs many drawings to layer the detail.

A tactile drawing can be compared to when a sighted person wants to explain someone to another sighted person. Then one sometimes makes a sketch to clarify the story as well. This is exactly the case with raised line drawings. They are a sketch to support the story told, to show: this is how it works, this is what I mean. Therefore it is super important to think about why people go to museums and the function of the drawing in the story. What do I want to explain?

The scale model of the bedroom of Van Gogh could also be done with drawings (top, side, etc). Scale models are simplified, you can't reach everything.

It should support the story as well. Also talk about the real materials and what is simplified/left out in the representation.

Size is important. A4 is often the maximum. This is because feeling is done with the hands. It's about distance and proportions.

When making the representation too large, distinguishing this becomes more difficult.

Note for me: What makes this work recognizable, why is it from this particular painter/artist?

'Komt het zien', Alette, head of the foundation 16/3/18

This foundation makes going to a theatre inclusive for people with a visual impairment.

Before the performance, the participants can go on stage and feel the décor and costumes. Sometimes they can feel a floor plan or scale model of the stage.

During the show, there is an interpreter who explains what happens on stage. The participants sit within the audience while having headphones on for extra inclusion.

The interpreter explains body language, who is where, movement, emotions, tension etcetera.

When I was there myself, I thought it was difficult to understand what she meant with left and right (viewpoint). What I also missed was room for interpretation. 'They seem to like each other.' 'He is looking for breakfast.' The interpreter told her view on the story.

People are enthusiastic because they can go to the theatre again. Just sitting in the audience and knowing what is going on is already a large improvement for them.

Wendy Voorn 20/3/18

Visio, department of children education.

She has also studied Industrial Design Engineering and graduated on an outside game for ill sighted children. After working for a while in programming etc. she wanted to go back to the user.

She also knows Maarten Wijntjes.

They learn something new every day about how ill sighted children experience the world.

For children blind from birth, forming concepts is very important. They are working on a project about that right now. Concepts can be colour, a cloud, a rainbow, or closer: a lamppost etcetera.

Height is very difficult for them, they just have no idea.

This is also the case with buildings. For sighted people, a house is a square with a triangle and everyone knows what is meant.

With early blind people, one should walk around the house, feel the stones or in a flat take the elevator.

3D to 2D is very difficult, but 2D to 3D is just as difficult. When early blind people draw a house like explained in 2D, they can still have no clue of the 3D form.

They are now working on a trajectory about the experience of 2D and 3D.

Paintings

What makes people moved by a painting?

She saw a translation where dark was deeper and light was less deep. Does that work? Does it make them happy or experience the painting?

Should you look for the image and composition or look for the experience? This might imply that you have to deviate from the actual painting.

For my project it might be useful to create a general image (Blind people can be very specific in their preferences).

What is the goal of the outcome? Should it be a mass production method? Should it be every painting?

Do I want to convey the experience or technique or both?

Think about the interaction: How do they experience it?

Techniques:

Powder print, FLA (working more in the 3D space). The prints from Océ work in 2,5D

Audio: With sound it's going to be even more awesome.

Dick Orange, in association with Rijksmuseum audio tour: 3D audio.

Also worked with Bijmans. Look up Virtual Barber Shop (not too loud).

Fonotonics: Balls with 8 corners, sound depends on the speed.

CRDLT, sound depends on how and what is touched by the device.

The more she thinks about it, the more complicated it becomes.

She discourages to use scent and smell, for it's very personal and needs quite some maintenance.

About materials:

She can bring the 'tactiel profiel', which is a box with several shapes, materials and structures. They use it to test what someone enjoys. It also has relief sheets. Combination with clay might be difficult.

Some people are actually sensitive. They do or don't like something.

Clay is useful to create, but also to adapt or combine other objects/structures.

It might be good to print shapes or landscapes (sloping or harsh).

Experience and build!

A3. Observation notes in format

Tour 1: Boijmans van Beuningen

Behaviour General	
Group movement (Also in relation to touching)	Braille
<p>After the explanation, many people in the group likes to walk around free and check out the painting up close or have a personal conversation with the guide</p> <p>In front of the painting, the guide put chairs. This was well received, especially since the story was quite long</p>	<p>Yvonne knows Braille. She liked to have this when seeing the Sagrada scale model in Barcelona.</p>
Speed and attention	Viewing distances
<p>The guide talked quite fast. This was perceived as quite okay.</p> <p>All the group members expressed they would like to see more than two paintings</p> <p>Yvonne needs to focus on one thing at the time.</p>	<p>Theo would like to look up close and have large letters.</p> <p>Before going to the original, they got to see a replica of heads in the clouds. This was perceived well, for they could look very closely.</p>

Other	
<p>When sitting on the chairs, the walking sticks et. were put on the ground, so their hands were free.</p> <p>Both the participants and their guides liked the possibility to sit on chairs when listening.</p>	<p>Yvonne tells she liked the maquette of the Sagrada Familia. She would like to touch one of Boijmans as well.</p> <p>For Theo, it might be better to choose a painting with more color and contrast, for that is better visible.</p>

Visually impaired Differences	
General (Background diversity and Independence)	
<p>Yvonne likes to go from detail to detail (like reading a book), otherwise, when the whole is described first, the story often doesn't fit with the image anymore, for she places details in a different position.</p> <p>Since Theo can still see a little, he often goes to museums on his own. The other three had companion.</p>	<p>It really becomes Yvonne's image. Whether it is fully correct doesn't matter.</p> <p>For Yvonne is blind, in every room they stand still and her companion describes the new room they are in.</p>

People with low vision (Focus, Not feeling, Differences between)	
<p>Theo really likes the enlarged images. He studies them carefully.</p> <p>Elvera points him things at the enlarged images. She mostly takes care of him, for he is on his own.</p> <p>At the end, Lizet asks for the enlarged images as well. She would have liked to have them during the story as well.</p> <p>Theo often visits museums. Often twice as well, to see the images he likes most in more detail, for seeing just takes more time.</p> <p>Lizet also often goes with her husband to museums. Both like to be independent.</p>	<p>All the ill sighted like to look up close in the end. Yvonne, who is blind, was always the first to leave, for she had the image in her head after the talk.</p> <p>At Ball, Theo asks about the contrast in the man and woman. This is something he has trouble with normally, so it's especially notable for him. (I hadn't noticed myself, interesting)</p> <p>Theo doesn't want to go down the wooden stairs, for it isn't visible well at all.</p>

Early impaired (especially blind) (Worldview, Well adapted & confident)	
<p>Lisa asks the most questions.</p> <p>She doesn't like when she's being forced into something.</p>	<p>All of them, but especially Lisa, seem to have a good bond with their companion.</p> <p>She also does more of her own thing, like stopping to feel the stairs, and is often last in the group.</p>

Behaviour Social	
Within the group (Discussions and helping each other)	
<p>Yvonne wanted to give the object to another, but didn't know where to. Theo put a hand on her arm to notify her she can give it to him.</p> <p>When the guide wanted to hand Yvonne something, she handed it to Theo with the order to give it to her.</p> <p>They all think the group size is fine.</p>	<p>Elvera told that in a previous tour, a blind and ill sighted person had a very nice interaction where the ill sighted person explained a lot to the blind person.</p> <p>Yvonne likes that the group is diverse. She prefers inclusion and wants to prevent division.</p>
Within the group (Challenging)	
<p>When feeling the replicas of Ball, people were invited one after another. Therefore the others had to wait. This resulted into interaction with the sighted companion and exploring the line drawings.</p> <p>Theo, who is on his own, almost walks against the stairs.</p> <p>For Theo was the only one on is own, he felt a bit outside the group. The people with a partner were really together all the time.</p>	<p>Some people go immediately after the explanation, others want to check out the painting more.</p> <p>The guide also expressed her difficulties with keeping the group together. She is afraid someone will touch something and feels responsible for both the people and the art objects.</p> <p>The story of the guide was very one way. Elvera explains that interaction (initiated by the guide) is super important. That leads to new and other insights and different feedback.</p>

With sighted others	
<p>It's difficult if you can't see whether someone is visually impaired or not. (Own experience.)</p> <p>The participants have a lot of interaction with their partners. Elvera even told that once there was a partner that took over the role of the guide and immediately started explaining the painting.</p>	<p>It's challenging to hand someone an object from further away when this person can't see you handing it to him/her.</p>

Visually impaired Expectations	
When is a painting well conveyed	
<p>Lizet wants to know about the background and the meaning.</p> <p>She wants to discover whatever is there in the painting, so jokes, metaphors etc.</p> <p>For Theo, contrast works very well, he wants to see every detail.</p>	<p>Yvonne wants to be able to create her own image.</p>

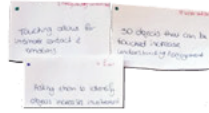
Of museum visit in general	
<p>For Theo it's important he can look up close.</p> <p>Theo also would like to see enlargements.</p> <p>All would have liked to see more paintings. Two was way too little for them.</p> <p>Yvonne would also like to know what the building looks like. This is affirmed by the rest of the group.</p> <p>It might be good to state the impairment when signing up for the tour, so also the paintings can be chosen accordingly.</p>	

Interaction with art Touch

General feelings and emotions

Touch conveys shape and size (especially visible when walking around the coat rack)

They would like to touch 3D art, like the Tower of Babel or the scale model of the museum. (Isn't possible now.)

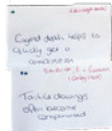


Specific related to paintings

The linedrawings of the outlines of the Ball seem difficult to feel for Yvonne. She often goes over them and her companion has to explain.

Yvonne tries to relate the two people to one another.

From all the attributes, only the palette and spatula seemed to add to the experience, for they were rather new for some.



Yvonne seems to have trouble with the line drawings, for the inside and outside of the Ball outlines aren't clear.

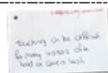
It seems easier to feel the life size painting than the raised line drawings.

Difficulties

Theo doesn't really need the attributes, for he can see quite well still.

When the attribute has reached the last person, he/she doesn't know where to leave it.

Because Yvonne, who is blind, has a visual memory, it isn't valuable for her to feel objects like spoons.



Interaction with art Connections

Specific to visual art & line drawings

The detailed line drawings of Ball seem to work better, for Yvonne can feel what her companion just described.

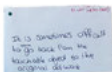
"Oh like I said: so here is the table and there is the glass I talked about."

Lizet would like to combine with an audio tour, so she can get a picture of the artwork and see more.



Relation to original artwork

Because Yvonne was able to feel the life-size outlines of the Ball paintings in the beginning, she has a better image.



Congruency of different stimuli

Since the attributes were passed along during the talk, they often didn't fit where the guide was in her story. This was annoying.

Most attributes were well known objects like spoons etcetera. This didn't add much to the story, especially for the ill sighted, for they could still see something.

Some attributes, like the palette and spatula were more unknown and thus more interesting.

The interpreter of Lisa even used it when interpreting for her.



Interaction with art Audio and other stimuli

Reaction to descriptions

People really need to focus on the sound, so during the talk, it wasn't possible for them to discuss, because then they would really miss part of their visual image.

When becoming blind, people learn to focus on audio. Lizet explains she first had to hear a story multiple times, but now she is trained in hearing and saving the information.

Theo wouldn't like an audio tour, for he needs his hearing to notice his surroundings.

All of them laugh at small jokes in the Peddler, like the underwear hanging out of the window.

References to well known objects/buildings work well: Guide: 'It looks like the Colosseum' Participants: 'Ohh the colosseum!'

Lisa liked the tempo and details. She would sometimes first like history and then what's on the painting.

Yvonne the other way around.



When do they not understand?

It was difficult for Yvonne to focus in a room full of other people walking by. It took her some time to get used to this.

When asked, she would still rather have this than a separate tour, because she wants to be included.

They don't understand when it goes too fast.

According to Lizet, a good build-up of the story is key.

Lisa would like building up step by step.

The well known objects were very distracting, especially for Yvonne who is blind, for they got her out of the story.

Lizet explains that it's difficult when a guide expands the story too much, for the main lead is lost.

For Lisa it's difficult when she doesn't know if something is part of the painting or background knowledge.

The attributes have to fit the moment of the story.

Reaction to other stimuli

Theo really likes the large images of the Peddler, for he can look really close and see every detail well.

Lizet also really likes the enlarged images and would have liked to have them on beforehand. This supports the story and the image easier.

What is nice about the enlargements is that details are cut out on a white background. This gives more contrast and focus.

Theo would like larger captions on separate cards.

Tour 2: Van Abbemuseum

Behaviour General

Group movement and attention



The group likes to walk freely through the space to experience it.

Mirjam tries to make sense of the room by asking questions about height and symmetry. She 'feels' the height.

Mirjam likes to feel what's where, so she has a sense of orientation.

They go back to the art work with the packages in small groups.

This first artwork is the only one where the group goes back to. The rest is explained in the other room.

For there were two guides, it was easier to go to the spot. No one was left behind.

Behaviour Social

Within the group (Discussions and helping each other)



By asking questions about the personal opinions of the group, discussion sometimes arose.

The participants reacted on what was told, but also on each others personal experiences. 'I like what you said about...'

The participants were also curious towards each other, how they saw colour etcetera.

When half of the participants were looking at the packages of Koonellis, the others discussed what could be in there by feeling it's weight and shape through the fabric.

Braille



Wim reads the braille underneath the relief of 'what kind of bird are you'.

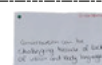
When talking about what they felt he says: 'It's something with birds'. Feeling this helped him make sense of the artwork.

Viewing distances



Since Wim can see contours, he stands from a distance of the artwork of a big crow, which is about four meters wide.

Within the group (Challenging)

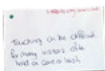


The discussions are being lead by the guides. They often have to ask questions to involve the group.

Most group members know each other. Wim is new. He needs to be addressed personally to be involved as well.

It's difficult to leave a blind person on his/her own when exploring a room, because not everything can be touched and he/she can get lost without the ability to ask for feedback.

Hands bound (In relation to walking sticks etc.)



When sitting, Annelies puts her stick down, but keeps holding the dog.

When walking, she holds only the dog as well and is guided by the room and the guide.

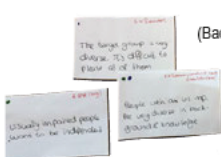
Wim's companion holds his cane whenever he wants to feel something with two hands.

Other

The artwork by Fontana has an optical illusion. You don't know whether it's cut or painted. This isn't possible to convey, for you immediately feel it's cut.

Visually impaired Differences

General (Background diversity and Independence)



For some, colours are very helpful. They immediately have an image. For others, they don't say a lot.

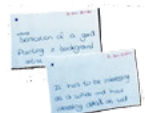
Blind people focus more on what they feel and hear, so therefore on the materials (what it's made of and what's inside, by stroking, lifting and ticking).

George is an artist himself, he has a philosophical background. Wim hasn't been in an museum for a long time and has little to no background knowledge.

George is therefore more critical and is really looking for the aesthetic experience, while Wim just thought it was interesting and he liked being in the present of art again.

Visually impaired Expectations/Experiences

When is a painting well conveyed



Mirjam is fascinated to hear about art and artists.

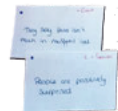
Mirjam thinks the attention of the painter should be transferred.

Wim just wants to see if he can enjoy art still/again.

George thinks that too much of analytical thinking prevents him from an aesthetic experience.

George wants to be overthrown by an artwork.

What makes the visit successful



The interaction seemed to be very enjoyable. The participants liked to share their opinion.

Most of this group and the guides knew each other already. They go more often. Therefore, it was also a social event. They liked to see each other again.

The companions of Wim went more often and wanted their friend to experience art as well. For them it also seemed enjoyable to share their love for art with their friend.

Many would like to know about the spaces and building as well. First exploring the room and then the artworks was stated as very nice by Annelies.

Early impaired (especially blind) (Worldview, Well adapted & confident)



People with low vision can see better, adapted & more confident.

Blind people from both sides, really different worldviews.

Interaction with art Touch

Tactile drawings

For George, a tactile drawing is 'a bit of guessing'. It looks like a face, but it doesn't.

George: 'Just a line drawing doesn't say much. It doesn't explain the atmosphere. You can't feel beauty.'

The participants feel with two hands and all fingers.

Because of the abstract lines, there is a lot of contrast. This makes it visible well for ill sighted also.

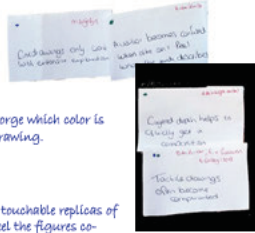
Therefore, Annelies, who can still see a little, doesn't really need to feel. Guide: 'Do you want to feel again?' Annelies: 'It's okay, I can still see it.'

The guide 'shows' George which color is where at the tactile drawing.

In Bologna, there are touchable replicas of a few cm deep. You feel the figures coming out of the painting. George enjoyed this very much. It gave life to the artworks.

Wim reads Braille with two hands and about four fingers.

The title explains. Wim: 'It's something with birds.' Mirjam: 'Ah birds, that's why the mouth is a triangle.'



Other tactile stimuli

George is enthusiastic about the little wooden scale model of the old building. 'Oh courtyards'.

The wooden scale model clarifies symmetry for Mirjam. She couldn't feel it when being in there. She 'felt' through the glass.

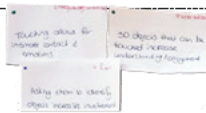
The other guide explains to Mirjam how she walked through the old building before by guiding her hand over the wooden scale model.

George about the artwork of Fontana: 'The cut, I feel it, it feels... painful.'

One of the guides accompanies Georges finger over the metal scale model: 'This is the facade, here are stones.'

Feeling the relief of the facade works good as well. Mirjam: 'This is the front right? I feel the turret. The taxi driver told me it looked like a church.'

By exploring parts of the artwork by Koutellis, first the package, then the shelf and its material, and explaining the placement, the participants form an image of the total artwork.



Interaction with art Audio

Reaction to descriptions

Association works well. About the installation of Koutellis: 'Above the upper shelf, there is a plume of smoke, just like with a fireplace.' Mirjam: 'Ahh.'

Making it personal is interactive. 'What would you put in the blanket?' Then she explains the meaning of the artwork.

The essence of the painting can be in its colors.

Wim: 'When I think about red, I see red. I try to keep that with me as well as I can.'

Explanation of the painting of Ernst about how it was painted (with metal objects behind the canvas) appeals to the imagination.

Stating the feeling that the colours provide work well also. 'A vibrant red.' 'The colors seem to come at you.'

When do they not understand?

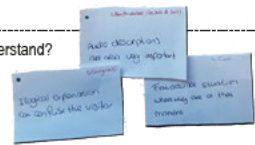
When not hearing well, the reverberation in a room can be difficult.

Only stating a color (red) does not say it all. Also stating the kind of colour ('vibrant red, like it's coming at you') was very helpful.

George: 'There are different kinds of red, what red is it?'

Some words are difficult and need explanation.

The poetry is sometimes too difficult to understand. The other guide explained it in easier words, which helped.



Interaction with art Other stimuli and connections

Other senses

'Twelve horses exhibition would be amazing, because you can also smell them and feel their warmth.'

Colours of paintings can be felt through fabrics as well. Mirjam has experience with Joffes method. She says she became emotional when feeling van Gogh's painting.

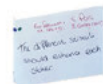
Poetry evokes a lot. They can make their own interpretation. It is also the way of explaining that they like.

George thinks that there are different associations with the fabrics. Also a fabric can have more associations depending on the context.

Congruency of different stimuli

'Twelve horses exhibition would be amazing, it would give a total experience of all senses.'

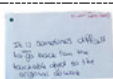
Mirjam thinks that the stories, reliefs and the colours system together provide the experience.



Relation to original artwork

First exploring the 3D parts and then going back to the original artwork worked quite well.

For the other artworks discussed, we didn't go back to them. This seemed odd to me.



A4. How to describe an image well

(parts of) The description of Coster (2009) about how to properly describe an image to people with low vision.

“Richtlijn 1: standaardinformatie

Begin altijd met de titel, kunstenaar, ontstaansdatum, media, grootte en plaatsing van het werk. Het is de bedoeling dezelfde informatie te bieden die ziende personen onmiddellijk verkrijgen.

Afmetingen geef je bij benadering (stappen, stok of met de handen).

Richtlijn 2: algemeen overzicht (onderwerp, vorm en kleur)

Een coherente beschrijving voorziet opeenvolgende visuele informatie, zodat blinde personen geleidelijk een overzicht krijgen van het volledige werk. Meestal wordt gestart met het onderwerp en komt vervolgens de compositie aan bod. Ter voorbereiding kun je als gids een eigen schets maken met de hoofdlijnen van het originele werk. Dit helpt bij het structureren van je beschrijving.

Daarna vul je aan met een algemene indruk van het werk. Vertel iets over de sfeer die het uitstraalt. Is het een helder werk, is het contrastrijk, welke zijn de hoofdkleuren? Kleur kun je verbinden met natuurelementen, bv. citroengeel, grasgroen etc.

Richtlijn 3: oriëntatie van het werk

Vertel hoe de personages en objecten zich ten opzichte van elkaar verhouden. Je kunt daarbij gebruikmaken van de cijfers op een klok als referentiepunt. Bijvoorbeeld: “De neus van het hoofdpersonage bevindt zich op drie uur.” ‘Links’ en ‘rechts’ kunnen voor problemen zorgen in een beschrijving.

Daarom kan het nuttig zijn om het lichaam van de toeschouwer als referentie te gebruiken. Bijvoorbeeld: “De rechterarm van de vrouw bevindt zich links van jou.” De positie van de bezoekers aannemen helpt hierbij.

Richtlijn 4: beschrijving van de techniek en het medium

Het kan interessant zijn de link uit te leggen tussen de aangewende techniek en het onderwerp van het werk.

Richtlijn 5: stijl

Stijlaspecten: penseelstreken, kleur, periode, kunststroming etc.

Richtlijn 6: woordkeuze

Duidelijke taal is cruciaal voor een goede beschrijving. Vermijd het gebruik van dubbelzinnig en figuurlijk taalgebruik. In plaats van 'flou' kun je bijvoorbeeld 'mistig' of 'nevelig' gebruiken. Verwijzen naar natuurelementen is een hulp. Tracht begrippen als perspectief (vogelperspectief, kikkerperspectief), voor- en achtergrond ook steeds te duiden. Vermijd woorden als 'hier' en 'daar': wees concreet.

Richtlijn 7: levendige details

Na de algemene informatie over het werk, kan de beschrijving specifiekere en levendiger worden. Specifieke details verdienen meer aandacht. Focus op bepaalde deelaspecten van het werk. Tracht bij die beschrijvingen objectieve maatstaven te gebruiken. Geef voldoende informatie, zodat de toeschouwer een beeld kan opbouwen en autonoom een oordeel kan vellen over het kunstwerk. Vermijd een 'overload' aan informatie (denk aan een routebeschrijving: als er te veel details vermeld worden, vergeet je de essentie).

Naar analogie met een ziend publiek is het de bedoeling mensen uit te nodigen tot een dialoog met het kunstwerk. Zorg ervoor dat wat je vertelt, vragen oproept bij je publiek.

Richtlijn 8: aandacht voor de plaatsing van het werk

Geef informatie over de plaatsing van het werk in de context van het museum. Beschrijf de zaal en de omringende werken. Bespreek de relatie van het besproken werk met andere werken in de ruimte.

Richtlijn 9: andere zintuigen

Leg indien mogelijk de link tussen bepaalde visuele indrukken en tactiele gewaarwordingen.

Richtlijn 10: verklaring van concepten die niet haptisch waarneembaar zijn

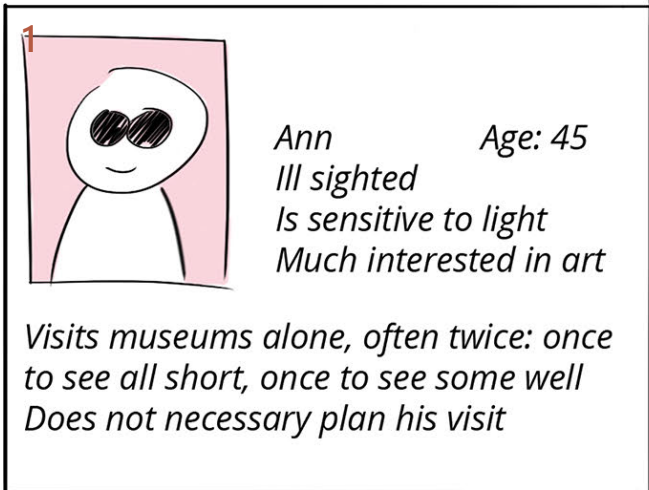
Concepten als schaduw en wolken zijn moeilijk te bevatten voor blindgeboren personen.

Probeer toch een beschrijving te geven indien dit belangrijk is. Je kunt aan de blinde personen vragen wat zij zich erbij voorstellen. Zo kun je schaduw verduidelijken door te verwijzen naar het gevoel van zonlicht op de huid. Waar je de zonnewarmte voelt, is het helder. Elders is er schaduw en zijn de kleuren doffer, donkerder. Wolken kun je vergelijken met watten.

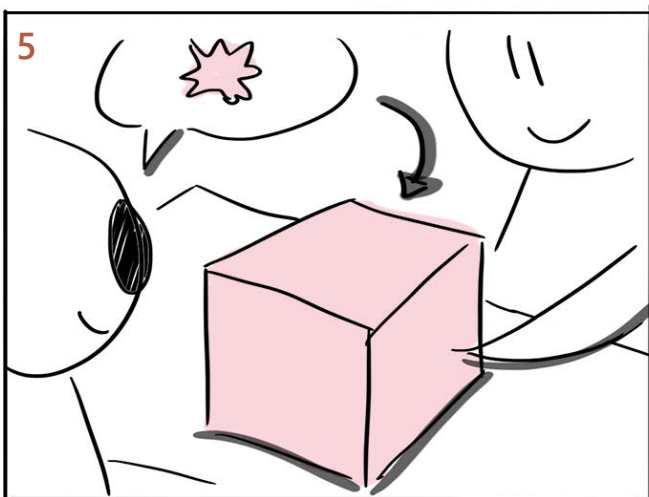
Richtlijn 11: informatie over de historische en sociale context

Het spreekt voor zich dat de historische context waarin het werk tot stand kwam, een belangrijk aspect is van het besproken kunstwerk."

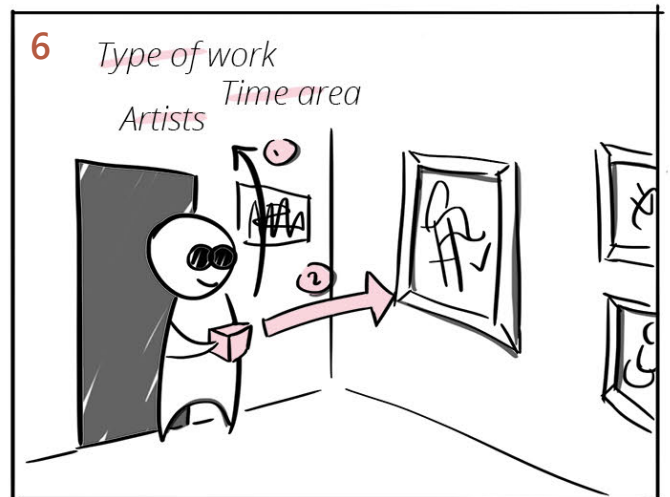
B5. Storyboard Personas



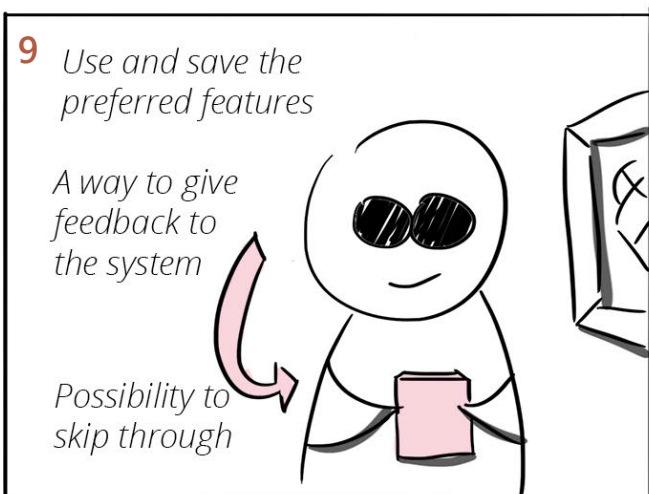
Enters the museum spontaneously



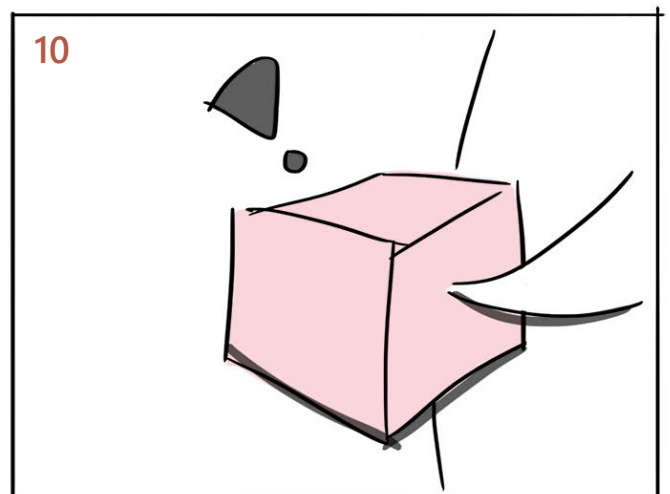
Personalizes Black Box to his impairment and interests



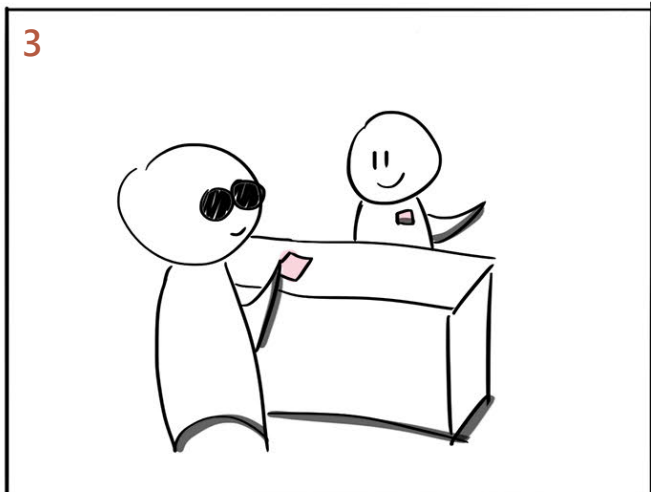
*Walks into the first room
Gets overview about the room and personal suggestion*



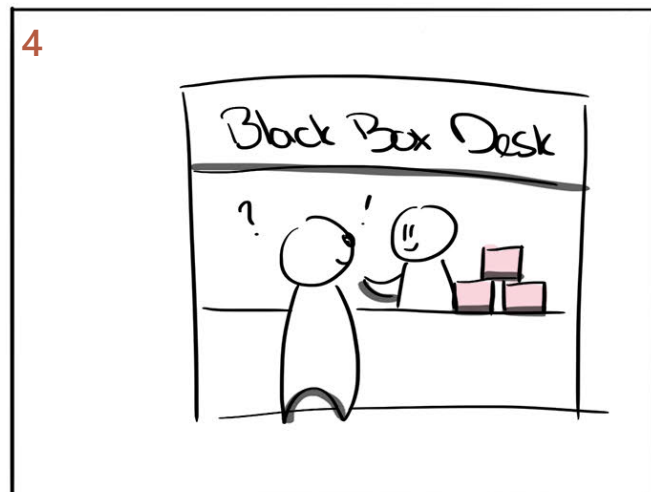
Decides shortly after he is not that interested in this painting, skips through and ends the interaction



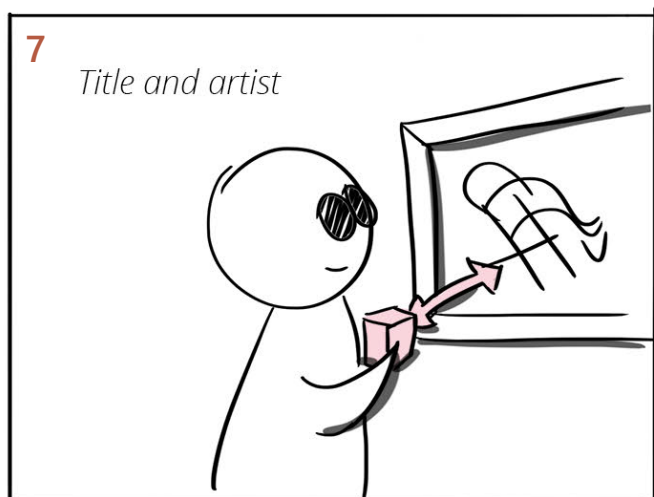
Black Box learns



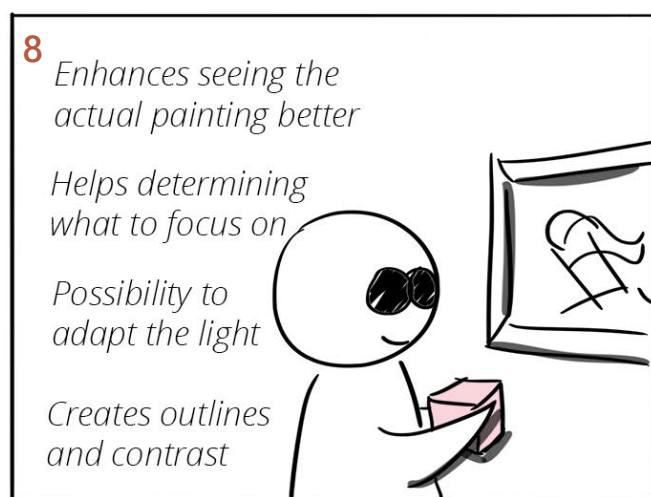
Buys a ticket, gets notified about the Black Box desk



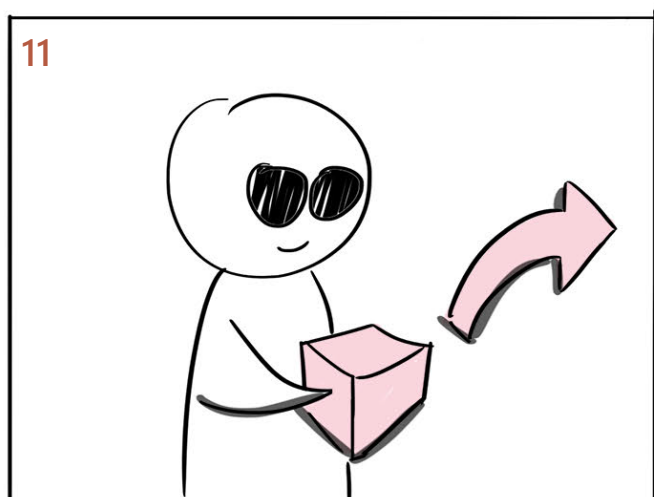
Goes to the Black Box and decides to take one with



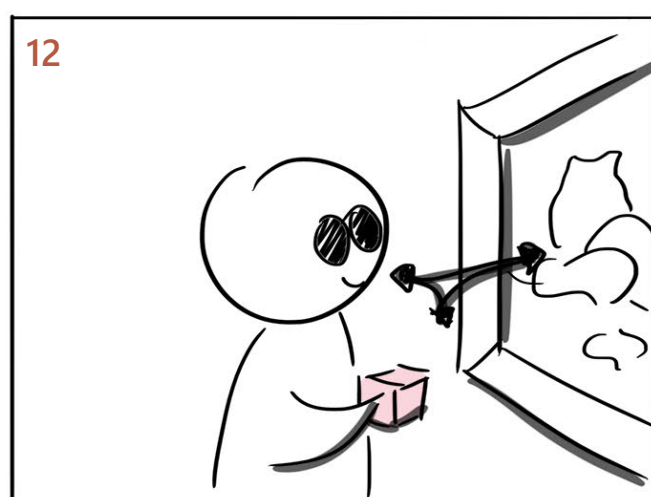
*Chooses the suggested painting
Black Box recognizes painting*



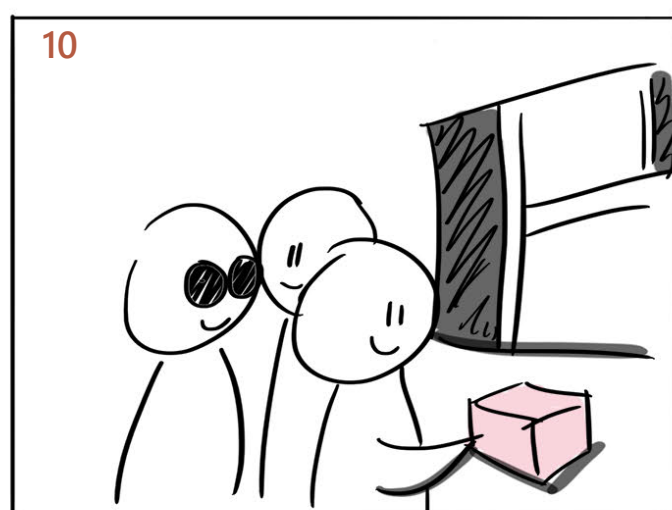
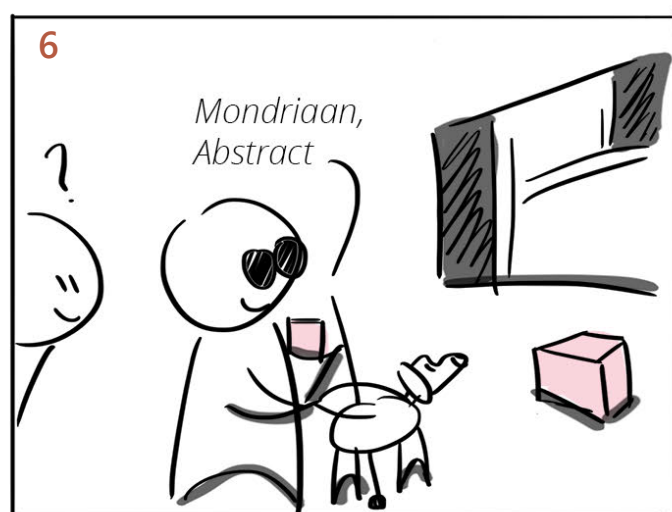
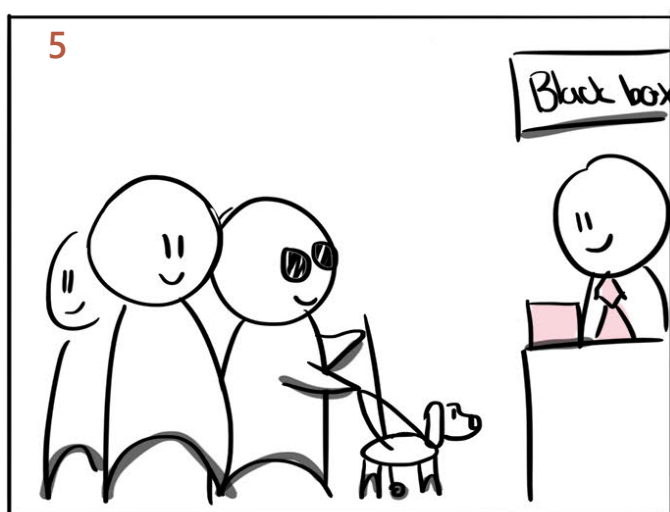
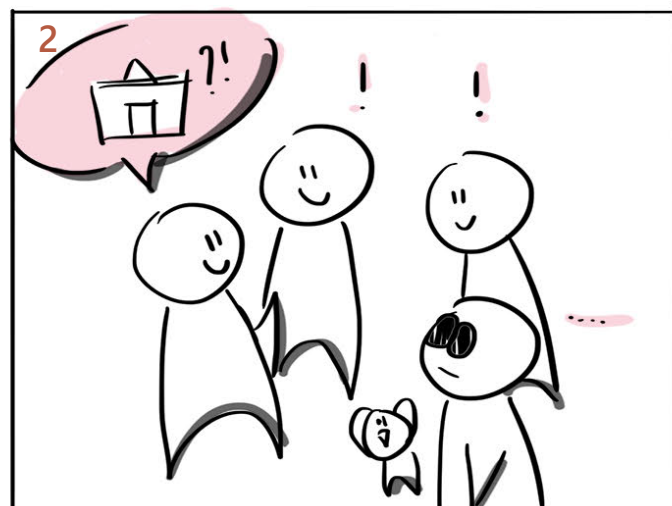
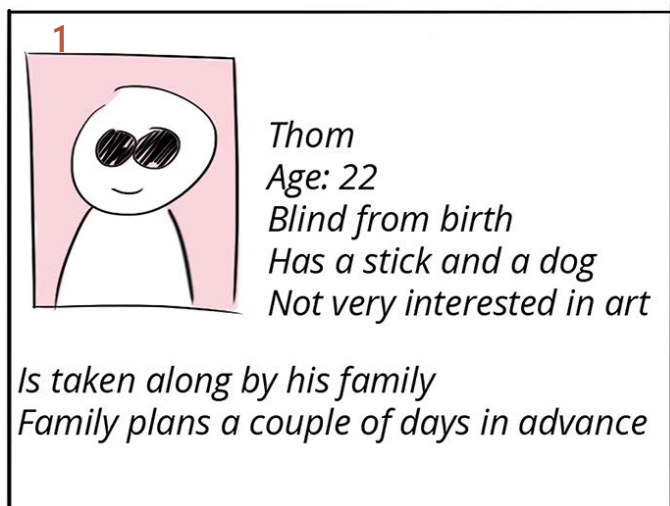
Interaction with Black Box

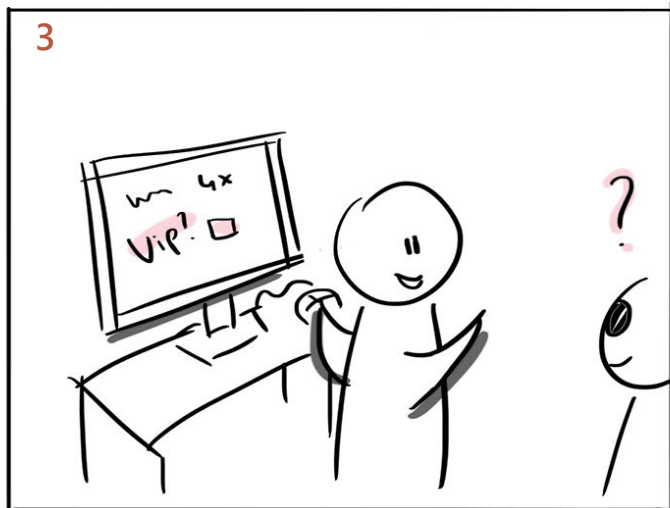


Suggests other painting

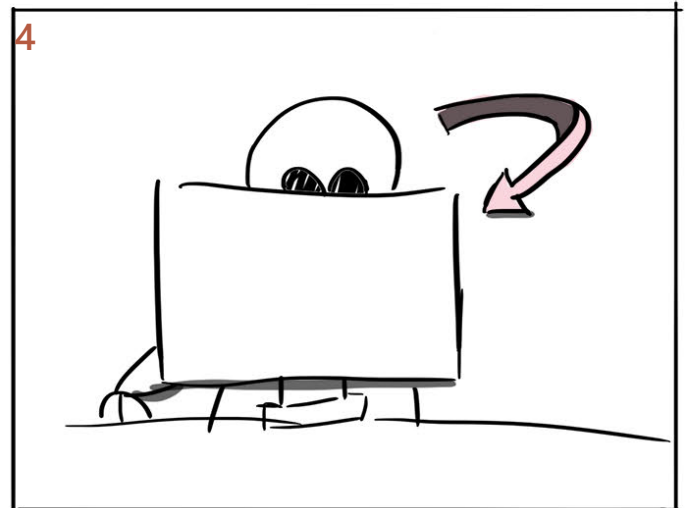


Deeper, more personal interaction

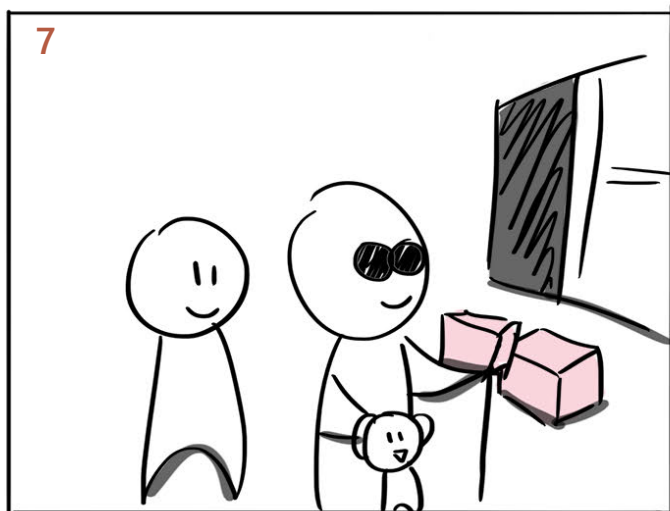




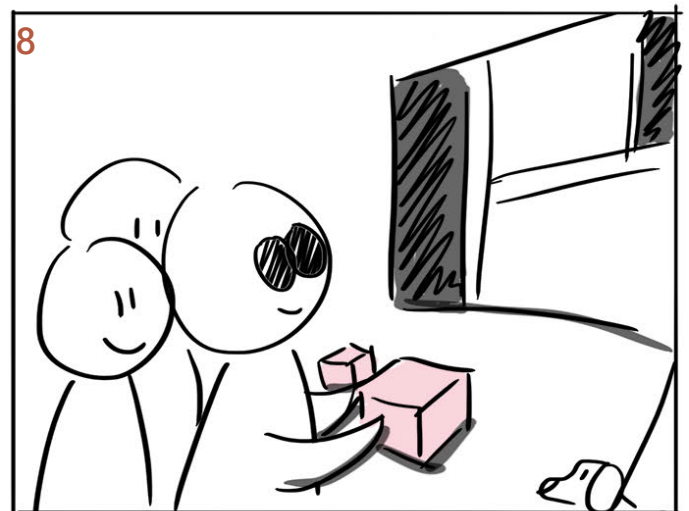
A couple of days before, they buy their tickets online
They check the VIP program



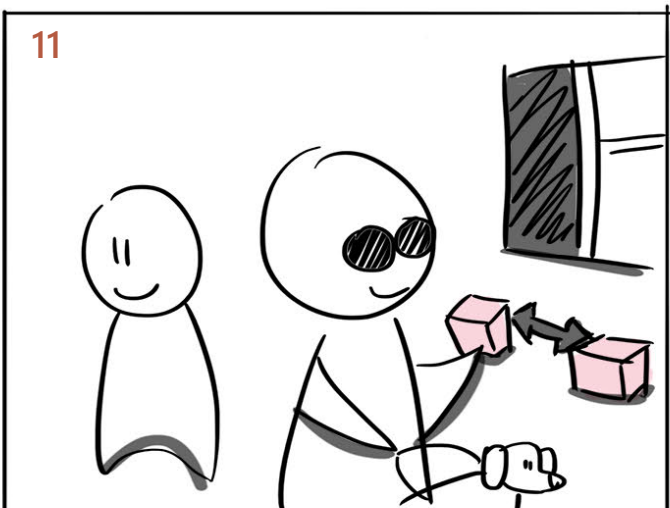
Thom can state personal preferences,
artwise and impairment wise



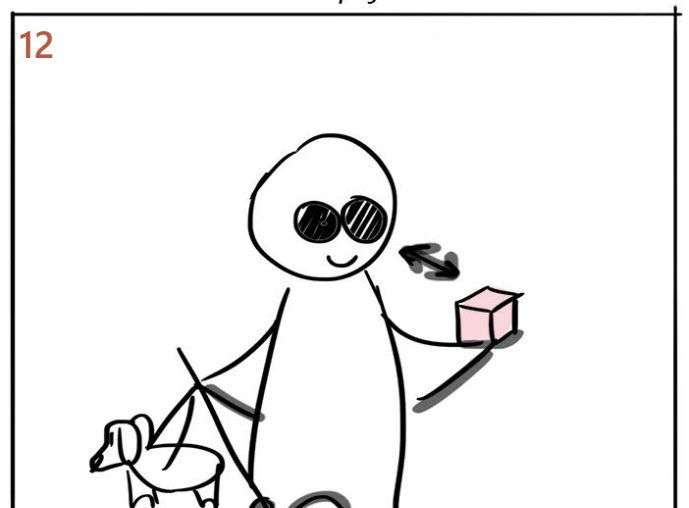
Thom decides it's interesting and
connects his personal Black Box to the
Black Box of the artwork



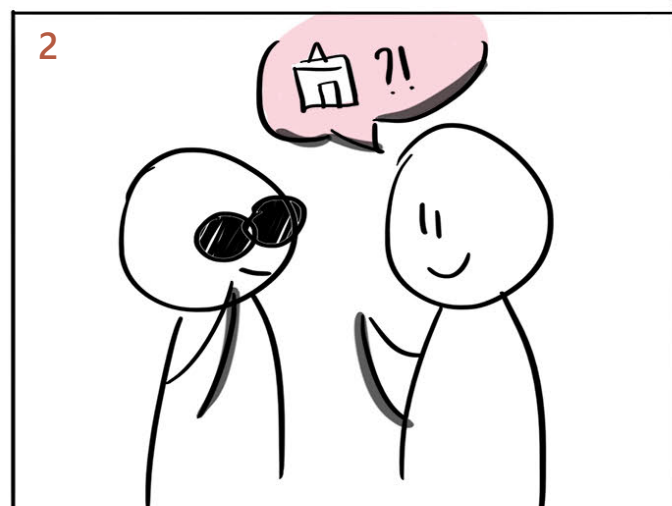
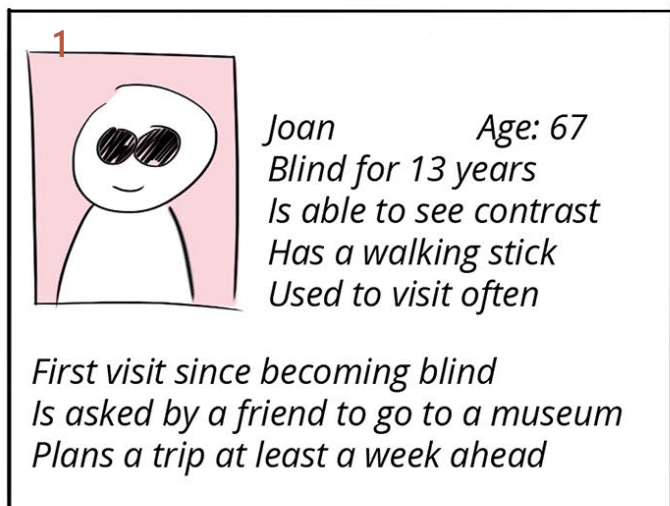
The Black Box of the artwork aligns with
his preferences and provides a suited
technique
There is room to empty his hands



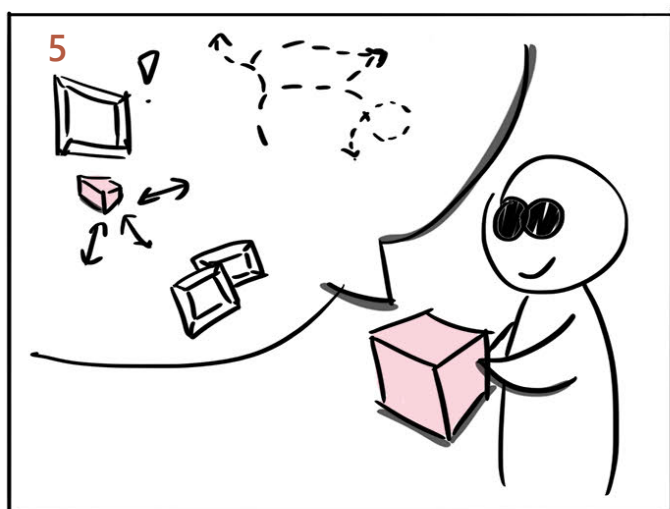
Thom has to disconnect his Black Box
from the artworks Black box in order to
go to a next one



He can tweak his preferences on his
personal Black Box in order to optimize
the interaction



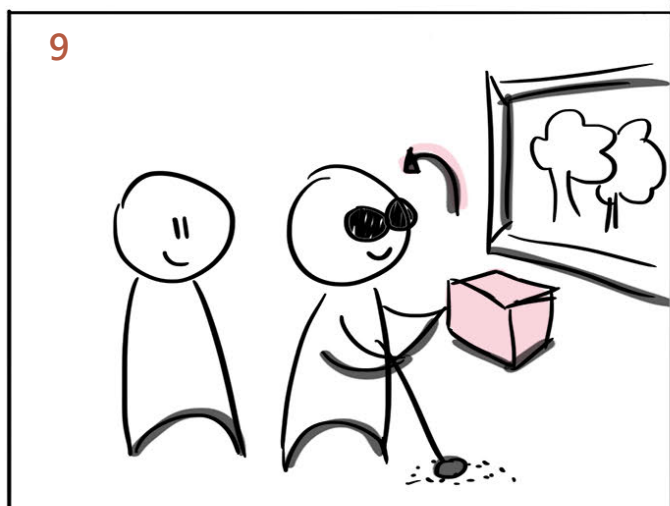
Joan gets asked by a friend to go to a museum
She hasn't been since becoming blind
and is doubting whether she will enjoy it



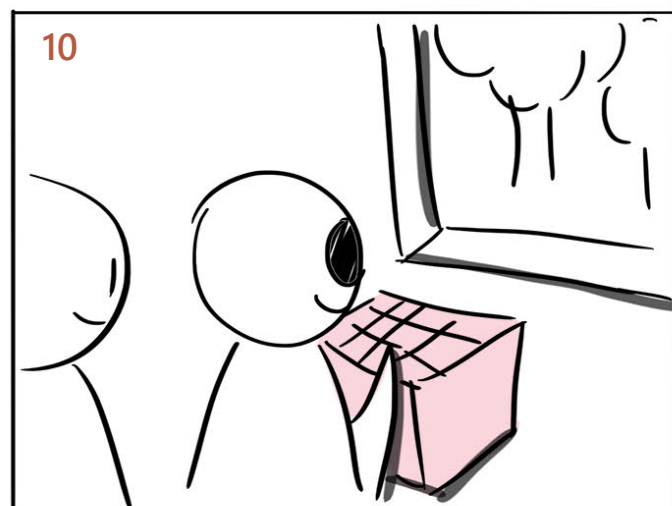
The Black Box explains the museum procedure
It can provide building&art information
It helps to feel secure, prepared and excited



When going to the museum, the preparatory Black Box is not needed to bring with



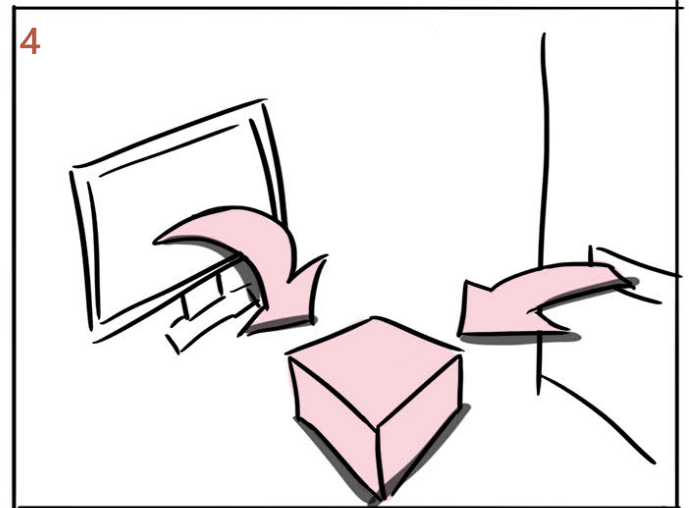
When she reaches the Black Box of an artwork, it provides basic information



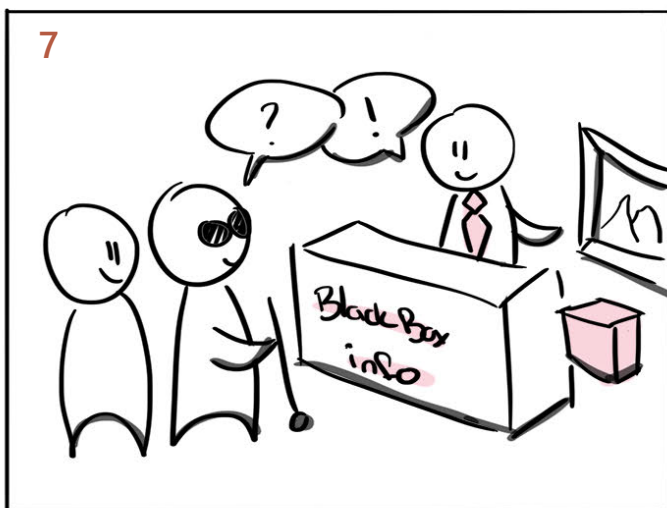
Joan decides she is interested and wants to know more,
so she finds her preferred technique



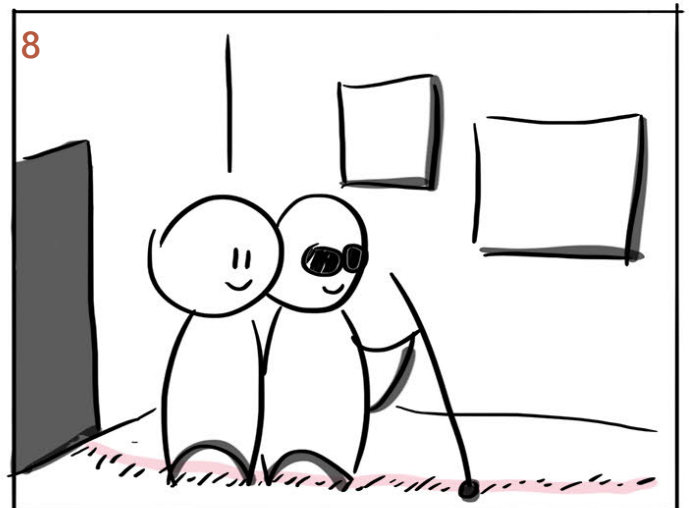
A week in advance, they buy tickets and order the free VIP prepare Black Box



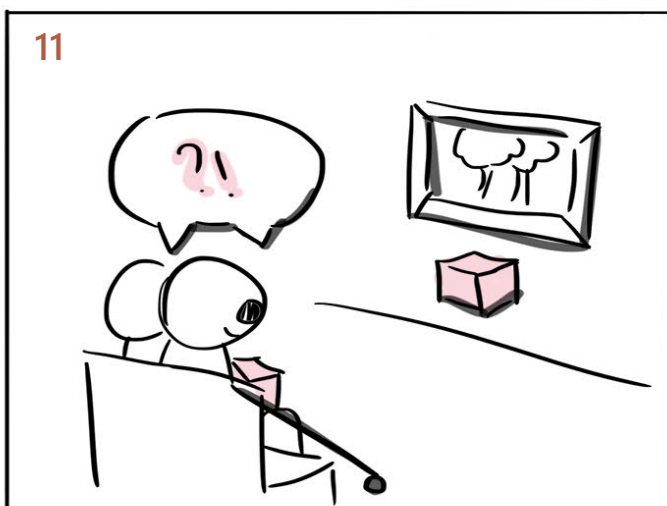
The Box gets sent home; Either online or physical



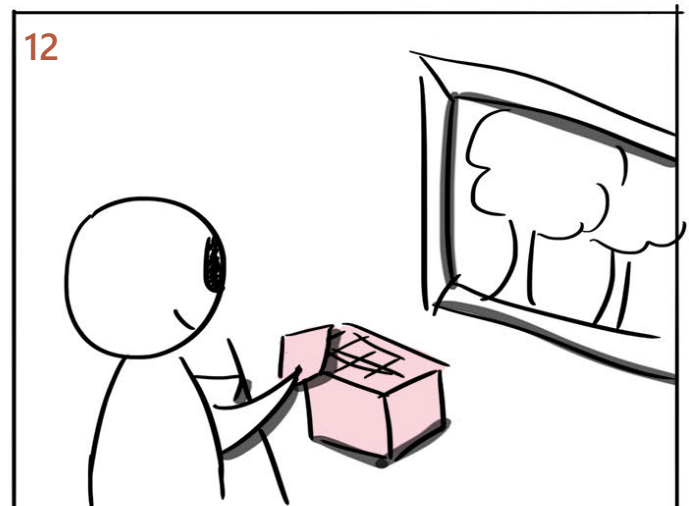
There is an explanation/practice point present to help finding and using the Black Boxes and further questions or for VIPs who aren't prepared



*Together they go through the museum, using the navigation system
Through the preparation, she knows where to go*



*She would like to sit down while exploring
Together, they can have a conversation*



*When done exploring, she puts back her technique and goes to another artwork
There, she can pick a technique again*

B6. Creative Session

Problem definition

The session started with an introduction of all the people who were in the room. This was very important since most persons in the resource group were not able to see who was in the room. To set the stage of the creative session an employee of the Rijksmuseum introduced 'Het melkmeisje' by Vermeer to the resource group. She explained the painting in a very visual way to provide the visually impaired and blind people of a good idea how the painting looks like. This was followed by the technique called progressive abstraction. This technique requires the resource group to ask questions starting with 'why ...' and continuously asking 'why' after each answer.

Some questions and answers

Why do you want to focus on the feeling of the painting?

Because paintings can provoke certain emotions. If you do not fully understand the painting then you might also not be able to be touched by it. And that's a beautiful feeling.

Why do we need to focus on 'Het melkmeisje'?

Because there is a lot of contrast, a good story and use of colours in the painting. And people who are visually impaired can see paintings better if there is a lot of contrasts.

Why focus on certain things, like contrasts, that blind people don't even see?

Since the design will eventually be for both blind and ill sighted visitors. For ill sighted visitors, contrast often increases the little sight they still have.

Already purged ideas

During this session people purged continuously the ideas that they talked about were:

- Consideration of what kind of colours are used. Very pale blue or very dark blue.
- It would be nice to also consider the products that are in the painting, like the can of milk.
- To do something with the frame of the painting.

At the end of this stage we agreed that the group would split up and both have a slightly different approach towards the problem statements.

Problem statements

1. How can you translate the feeling/ experience of a painting towards people who cannot (properly) see the painting, *when visiting an exposition individually?*
2. How can you translate the feeling/ experience of a painting towards people who cannot (properly) see the painting, *when visiting an exposition with a small group of visually impaired or blind people?*

Idea generation and selection

Group 1 worked on the first problem statement and the Group 2 on the second. The resource group was asked to just call out any idea they had. I asked the two employees of the Rijksmuseum to write all ideas on Post-Its and to read them out loud so now and then. A lot of tinkering objects were placed on the tables for inspiration and as means of communicating ideas.

After a lot of ideas were thought of we looked at how we could involve all our different senses in the experience of a painting. And also how to combine senses in the experience. This stage of the session ended with the division of groups of 3. They discussed together which ideas they liked the most for each of the senses.

Idea improvement

This stage started with four groups of 3 people. Each group had one sighted person and two visually impaired or blind persons. The groups continued working on their own problem statement, so two groups were working on the first problem statement and two on the second.

The assignment they got was to end up with one concept for experiencing 'Het melkmeisje' with all our senses. They could look at the ideas they liked in the previous stage, but also think of other ideas for the senses to improve their idea.

The end result were four concepts presented by either a textual explanation or a model with explanation.

Concepts

Concept 1

The concept is a auditory explanation of the painting. Not only focused on what you can see on the painting but also what you can't see. So what kind of noises do you hear? What do you see when you look out of the window? How does the wall behind the woman feel like? It is all about setting the scene in order to translate the experience the painting provokes.

Feedback from one of the other participants: auditory explanations are already often presented at museums, but it is important that they are usable for us too. If the auditory explanation has a touch screen I cannot use it.

Concept 2

3D reproduction of the painting. The frame of the painting lays on the ground, so you have to enter the painting. You can pick up the milk can and as soon as you pour the milk an auditory story starts being told. So you as a visitor play the role of the Melkmeisje and you also have to act like her by pouring the milk. Also for the different groups of being visually impaired to blind there should be different tactile drawings. These tactile drawings can explain the composition of the experience you just had while pouring the milk.

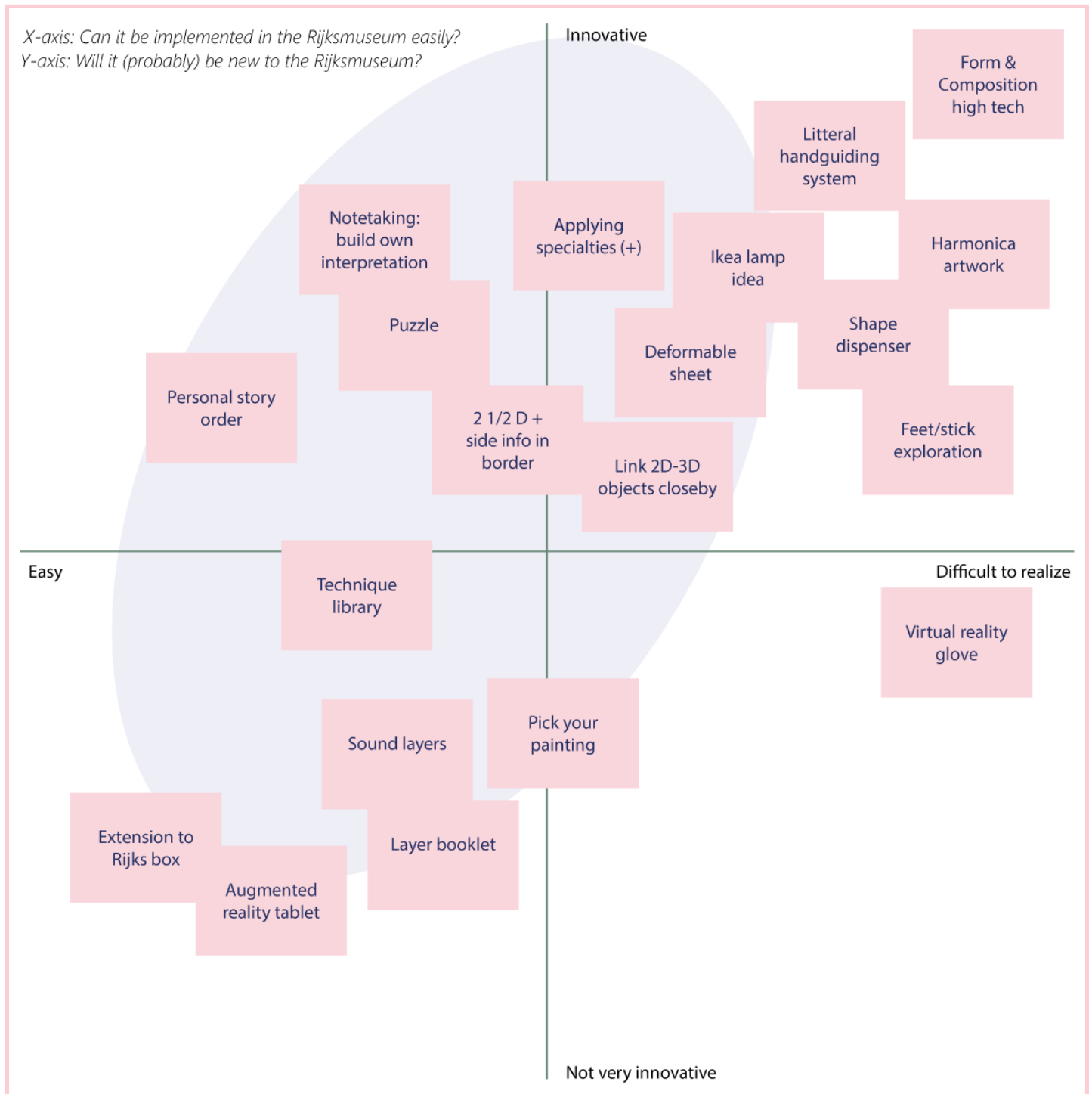
Concept 3

As the previous group this group also thought of a 3D reproduction of the room the Melkmeisje is in. While exploring this room you can find buttons that start auditory information about the part of the painting you are exploring. So if you are near the stove you can touch it and hear the story about it. Next to that, if you touch the girl she will tell you what she looks like. And near the window you could hear the noise of the streets. An important note they made is that every object should match the material's temperature. So the wall should be cold, the girl warm, and maybe the stove could be hot.

Concept 4

This concept is about the experience of the materials of the painting. It could have the shape of a book. The first page shows the whole painting, the next painting a tactile drawing, the next painting the materials of her dress, you could smell the bread or milk, etc. So you start exploring the whole painting and continue to explore every aspect of the painting. This 'book' could be placed next to the painting accompanied by a magnifying glass for the visually impaired.

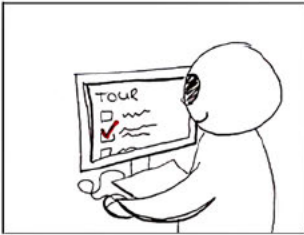
B7. C-Box



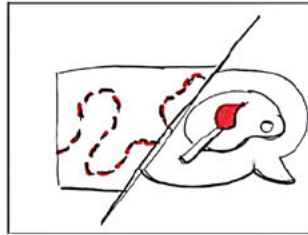
B8. Storyboard Concepts

A

At home

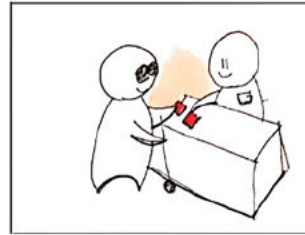


When buying the ticket, choose one of the available tours

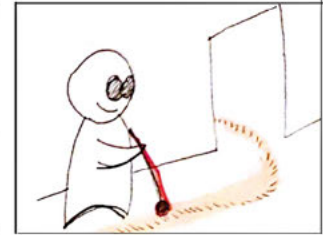


Get a virtual tour or relief map about the building and route
Receive background information about the tour

At the museum



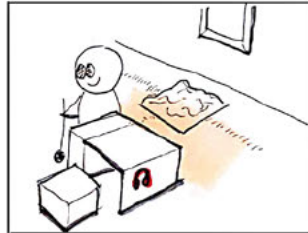
When going to the museum, receive a token that will unlock the exploration points



Follow the relief guiding you through the museum towards the exploration points



An attention spot will let you know you encountered an artwork: The spot reflects the size and expression of the art



When interested, go to the exploration point nearby



Sit down, scan your token to turn it on and put on the headphones



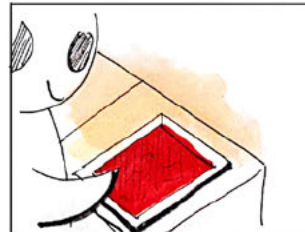
Start with the basic relief
The audio guide will tell you how to go



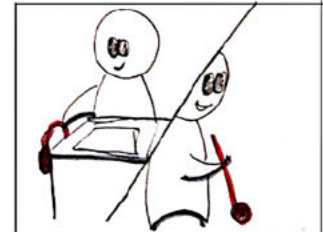
Touch the labels to feel the specialties
You will receive audio or tactile (braille) information



Choose one, take it and put it on the basic relief
It will click on with magnets



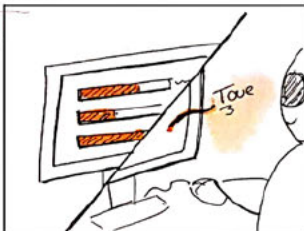
Listen to the audio guide who will tell you how to interpret the layer



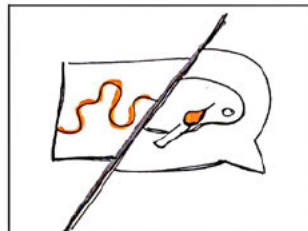
Put the layer back if you're done
Put back the headphones, take your token and follow the lines to resume your tour

B

At home



Enter information about your likes and dislikes
The system recommends a fitting tour



Get background information about the building
route and tour you are about to follow

At the museum



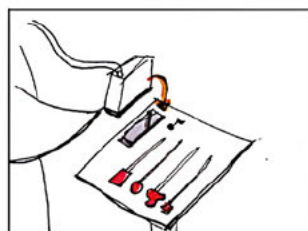
When going to the museum, receive your audio device and headphones and information on how to use it



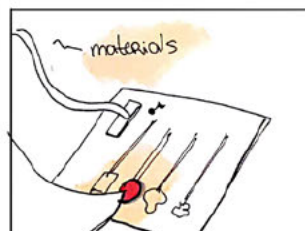
The device guides you and provides information of the building and the art present



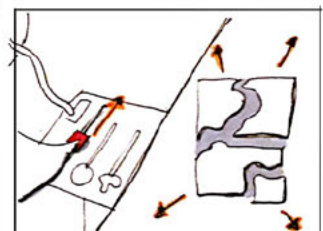
When approaching an artwork, it will tell you and provide basic information about the work



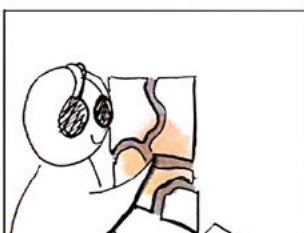
When interested, place the audio device in the board to connect



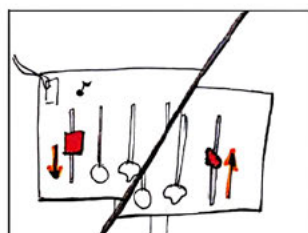
Touch the buttons to get information what it's about



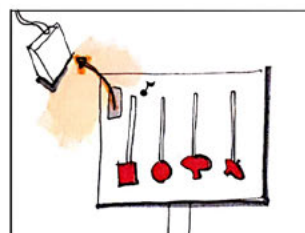
When sliding, upwards, the artwork will split accordingly: the further, the wider
It will provide tactile and visual edges



Explore the artwork with your hands and get audio feedback according to the mode you're in
Touch note to change mode



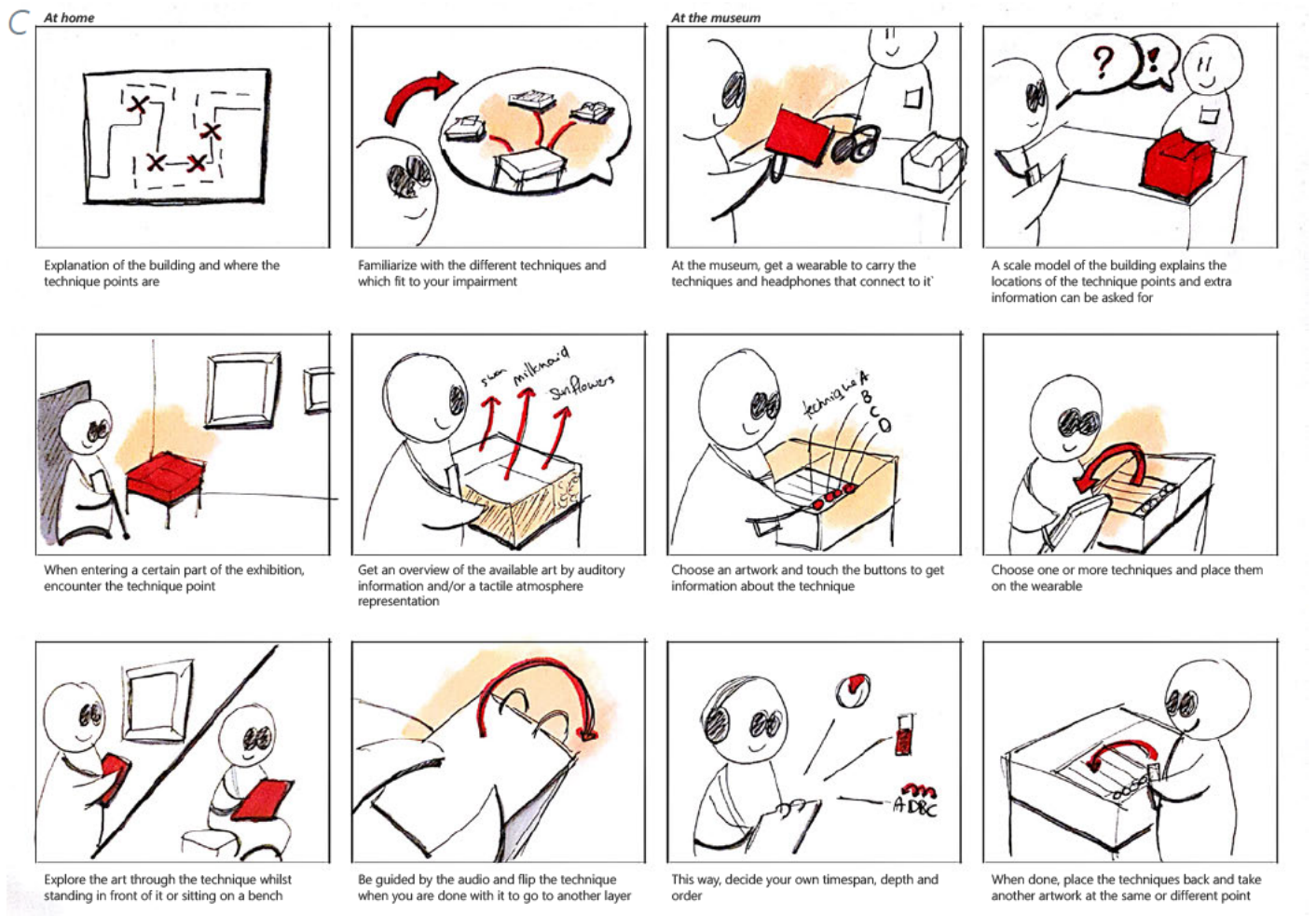
Turn the slider back to it's basic position, before sliding another button to get a different approach



When done, slide the button back and take out your audio device



Resume your tour



- A. Exploration table
- B. Splitting the art
- C. Take your technique

B9. Set-up Expert Feedback

What to send

Drawings of the ideas.

Storyboards on how they are used in context.

Sent explanation

Bedankt dat je mijn ideeën wilt evalueren!

Het zijn drie concepten, elk in een apart pdf bestand. Elke pdf bestaat uit twee pagina's: Uitleg van het concept en een storyboard hoe het concept in een museum gebruikt zou kunnen worden.

Het idee van mijn concepten is niet dat het er binnen een jaar zou moeten kunnen staan, maar meer een toekomstvisie, het ideale plaatje. Hierbij is het doel dat een blinde of slechtziende bezoeker zelfstandig het museum zou kunnen beleven, zonder begeleiding van een tour.

Let op, de concepten zijn nog niet volledig uitgewerkt, het gaat om het idee erachter, niet om de precieze uitwerking. Verder bestaan de storyboards uit verschillende fasen. De elementen hieruit kunnen in principe ook op andere concepten toegepast worden.

Ik wil je vragen om bij het bekijken van de concepten gelijk de eerste reactie op te schrijven en daarna eventueel naar de vragen te kijken.

Questions per concept

Wat is je eerste reactie? (Mocht je die nog niet opgeschreven hebben)

Wat valt je op aan het concept? Wat vind je sterke, zwakke en interessante punten? (format maken)

Welke elementen uit het storyboard zouden goed kunnen werken voor slechtziende/blinde bezoekers?

Welk concept zie je over vijf a tien jaar in een museum staan? Waarom die wel en de anderen niet?

B10. Design briefs & Sketches

Design brief 'Portable exploration table'

Online preparation

Accessible website

Clear description of how to use the boxes

Building navigation (audio tour, virtual tour, tactile map, scale model)

- Map of building in general
- Tour information
- Where to find the boxes

The possibility to choose/create a tour

Background information on the art and building

The visitor should be able to adjust the audio to their impairment and preferences (depth & perspective) before and during the tour

Audio guide

The audio device should be easy to handle by visually impaired

- Actual buttons
- Clear difference between buttons and clear which one does what
- Tactile or audio feedback when changing settings
- ..

The audio device should

- Guide one through the museum to the artwork with box (in tour)
- Recognize the artwork when walking by and tell if a box is available
- Be easily connected to the box
- Guide the visitor over the basic relief and other layers
- Recognize the layer that the visitor wants to explore
- Guide the visitor through the technique
- Preferably the information should be layered to adapt to the knowledge and interest of the visitor

Exploration case

The design should be portable (with regard to stick and dog)

The design should be easy to install

The design should be comfortable in use

- Explorable while seated
- Not hard or heavy

The pop-up system should be intuitive in use

The layers should be easy to use

- Clear where they are
- Clear which one has what topic
- Easy to apply and put back

Design brief 'Take your Technique'/'Inzoomer' extension

The design will probably consist out of different elements which have their own requirements. These elements all fit together as explained in the accompanying storyboard. Also several examples of how the technique could be carried out are drawn.

Preparation

The user can start at home or at the beginning of the museum visit, exploring the different techniques available. Also important here is to explain the way the techniques are presented.

Requirements

Clear description of

- the techniques, possible with examples
- where and how to find the boxes
- how to use the boxes

The possibility to choose/create a tour

Background information on the art and building

Building navigation information (audio tour, virtual tour, tactile map, scale model)

A box (in the broadest sense)

When encountering an artwork the visitor would like to explore, he/she can take their preferred technique(s) out of the box.

Requirements

The visitor should be able to

- know whether a box is available for the artwork
- find and recognize the box (possible recognition spots)
- know which techniques are available within the box (tactile or audio)
- easily find theirs and take them out

The techniques

The visitor can choose between several techniques, to take the one most suited for their interest and impairment.

Requirements

There should be techniques for both ill sighted and blind visitors

What should be conveyed:

- The image
 - o Forms
 - o Composition
- Story (what is happening and why)
- Appearance

- o Colour
- o Painting style(s) & materials
- o What makes it special (like light, perspective, optical illusion etc.)
- Background
- o Of the artist (time, technique etc.)
- o Of the work (in relation to other work of the artist or of that time)

A transportation device

The visitor can take the chosen techniques to a place where he/she would like to explore the art.

Requirements

The device should allow for sitting and standing exploration

The techniques should be easily assembled, held together and switched between

The visitor should not be bothered by the device with regard to stick and/or dog

An audio device

The tactile experience and audio should complement each other

Requirements

The audio device should be easy to handle by visually impaired

- Actual buttons
- Clear difference between buttons and clear which one does what
- Tactile or audio feedback when changing settings
- ..

The audio device should recognize

- the artwork when walking by and give feedback whether a box is available
- the available techniques (or the techniques should be the same in every box)
- the chosen technique when wanting to explore

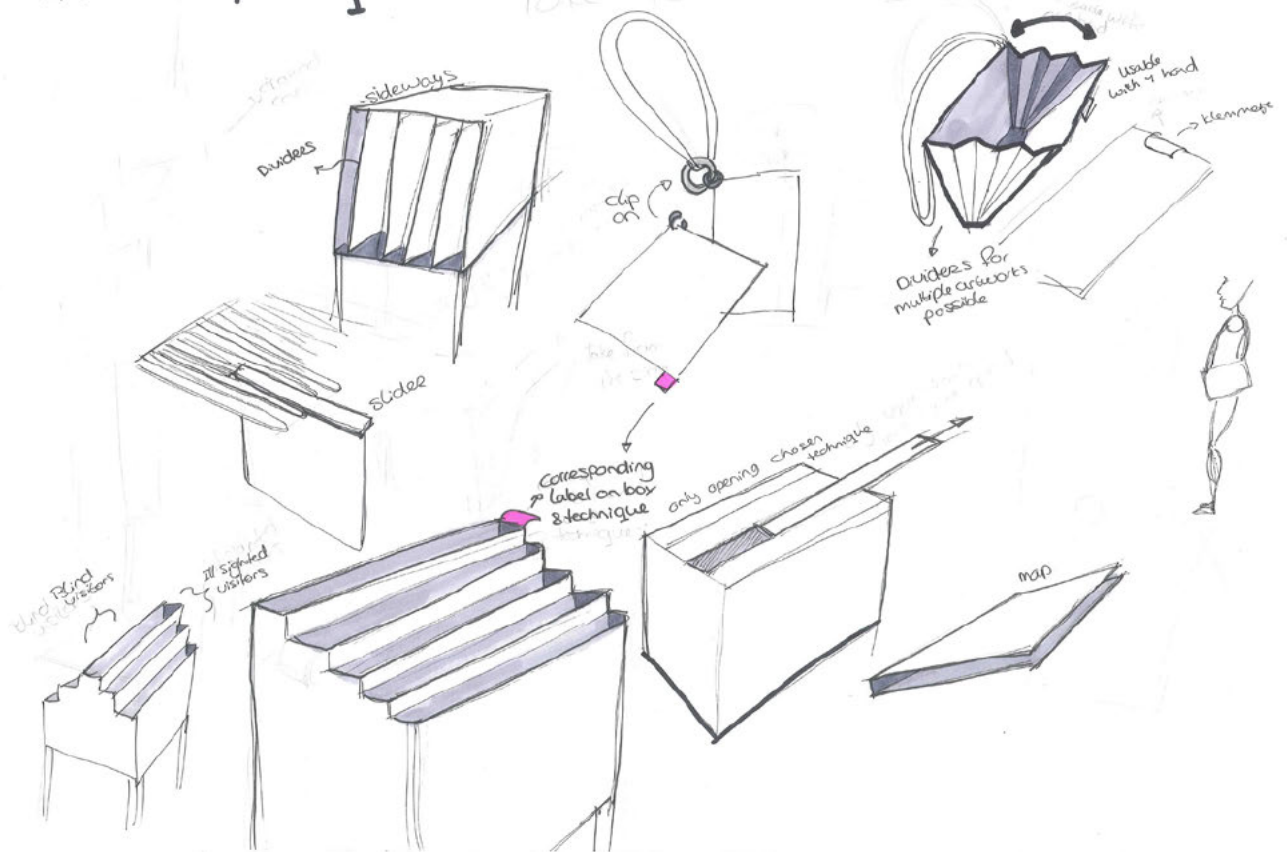
The device should guide the listener through the technique

Preferably the information should be layered to adapt to the knowledge and interest of the visitor

Possible techniques for

- Ill sighted visitors
- o Enlargements (text and image)
- o Cut outs
- o Enhanced contrast images
- Blind visitors
- o Relief drawings (line drawings or more detailed reliefs, build-up of composition)
- o 3D objects (only when they really add something)
- o Material relief
- Both
- o Replicated piece(s) of the actual artwork for painting style(s)
- o Related scent (scratch scent, tube etc.)

Take Your Technique



C11. Brainstorm presentation



The goal of my graduation project is to make visual art (paintings) accessible for visually impaired.



An often used method is raised line drawings, literally lines that you can feel as seen here. I found that they are difficult to follow and require a taught technique.

Form & Composition

When describing a painting, often first the forms and composition have to be made clear. The best working approach is a combination between tactile and auditive stimuli.



Reliefs, as shown through this painting in the art history museum in Vienna, are already easier, for they provide depth information. This can be simple, like on the middle image, but also provides space for more detailed and textural information, which is appreciated by the more experienced visitors.

C12. Prototypes in detail

Height prototype

This basis of the prototype is a layered relief of 'the Milkmaid'. This is created by tracing the image first and then assigning shades of gray to the different areas according to the presumed height of the work, as seen in image 2.1.

These layers are lasercut out of 2mm MDF and glued on top of each other, as seen in image 2.2.



Image 2.1: Height map of 'the Milkmaid'

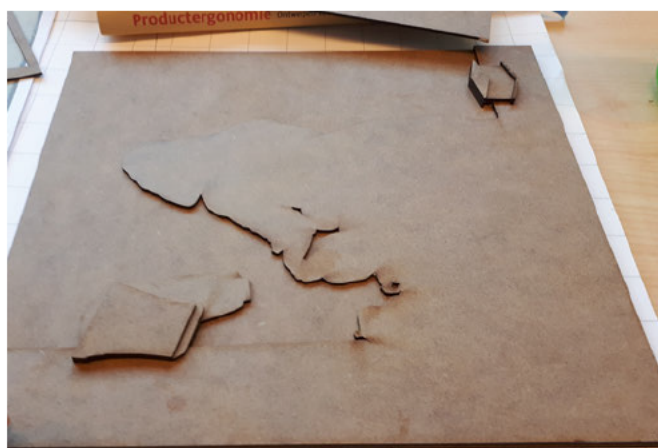


Image 2.2: Building the relief

In order to bring the pot to the front, the part was lasercutted separate several times with extra material on the bottom so it would fit into the pot of the relief as seen in image 2.3.

During the test, the different heights (image 2.4) of the pot are placed on the relief manually, in different order per participant.



Image 2.3: Front and back of the add ons of the pot, showing how they can be placed on top of each other.



Image 2.4: Different heights of the pot

Vibration prototype

The prototype is a cut out of the relief of the height prototype, the scale remains the same.

The pot and bowl are created apart from the outer parts in order to not transfer the vibration (image).

In each of the separate elements, a vibration motor is placed (image 2.6 and 2.7). The bottom is made of isolation material to absorb the remaining vibration (image 2.8).



Image 2.5: The back of the pot and bowl

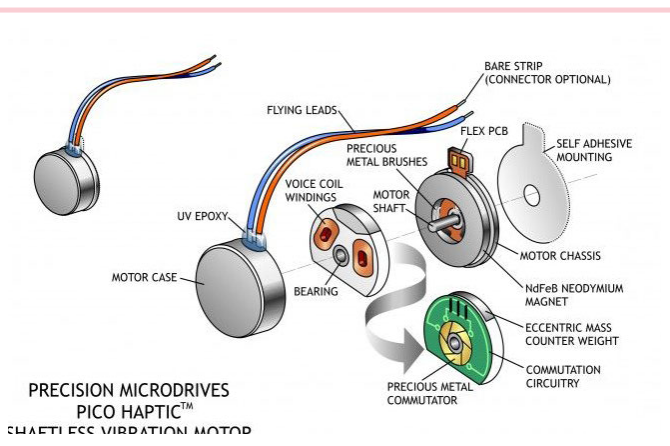


Image 2.6: Coin vibration motor

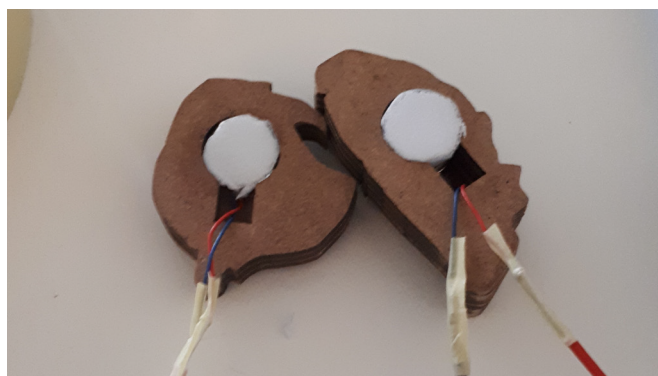


Image 2.7: Vibration motors placed, covered with isolation material

The vibration motors are driven by an arduino. The circuit and code can be seen in image 2.9 and 2.10.



Image 2.8: The outer part with isolation material

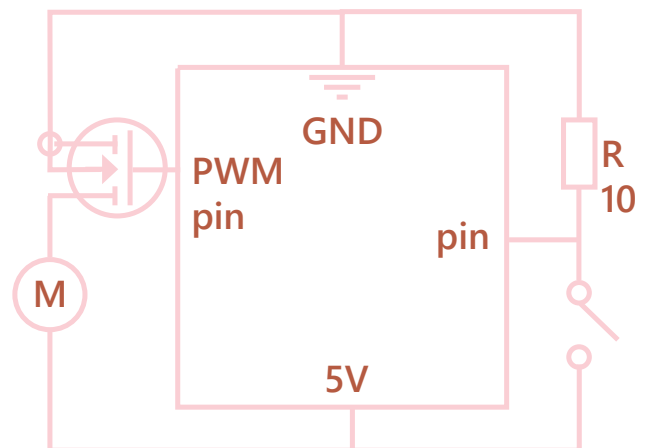


Image 2.9: Circuit for one motor & button

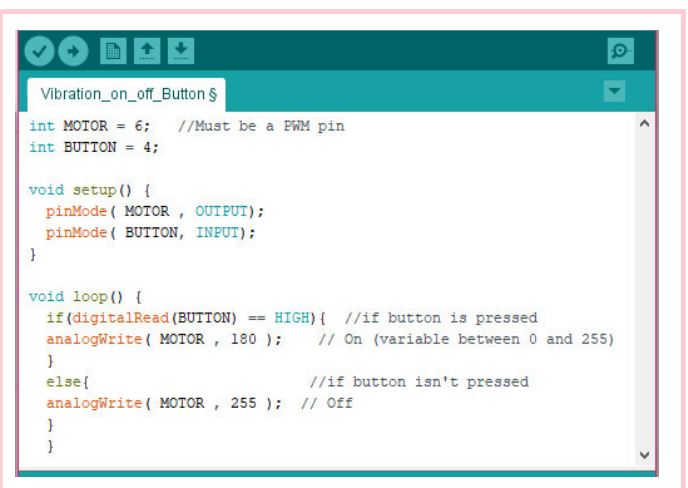


Image 2.10: Arduino code for one motor & button

Magnet prototype

This prototype exists out of a box with the cut out of the milkmaid integrated, to have the same wooden tactile experience. The prototype had to be flat, for the magnet to run over it smoothly. In order to move the magnet, another magnet was placed on the bottom of the box, as seen in image 2.11. It was the intention to use electro magnets (image 2.12), but these appeared to be too weak and unstable.

Some markers were placed on the bottom in order for me to feel where to guide the participant to during the test.

Since the prototype had to be flat, textures were applied in order to create differences between the surfaces. This was done through engraving certain areas and placing tape, paper, pieces of hard and soft rope and glue on top of the surface as seen in image 2.12.



Image 2.11: The inside of the box with a magnet on top and below



Image 2.13: The surface of the image with different textures.

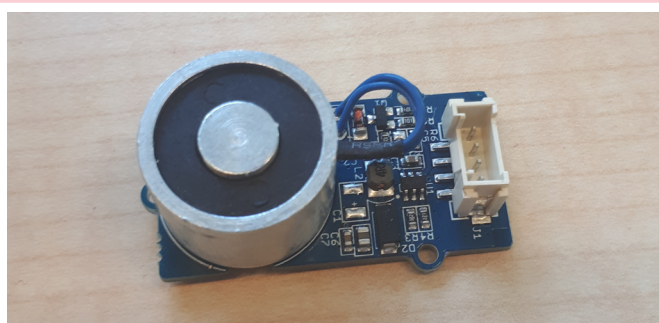


Image 2.12: The tried electromagnet

C13. Test story and questions

As all of the participants were Dutch, the test was done in Dutch as well.

Test uitleg

De test bestaat uit drie mini testjes over hetzelfde onderdeel, dus drie versies van hetzelfde concept. Ik begin nu met een inleidend verhaal.

Inleidend verhaal

Je bent twee jaar geleden onverwacht erg slechtiend geworden. Nu vind je het wel weer eens tijd om erop uit te gaan. Van een vriend hoorde je van het programma voor blinden en slechtienden in het Rijksmuseum en je besluit een bezoekje te brengen.

Je bent in het museum. Met behulp van je stok en een audio guide baan je je een weg door de eregalerij. Je krijgt informatie over de schilderijen waar je langsloopt. Dan kom je bij het Melkmeisje van Johannes Vermeer.

Heb je dit schilderij al eens eerder gezien? Kun je het beschrijven voor me?

De audio guide begint te praten:

"Dit is het melkmeisje van Johannes Vermeer. Het is een figuratief schilderij, geschilderd rond 1660 met olieverf op doek. Op het schilderij zie je de linker en achterwand van een kale ruimte, waarschijnlijk een keuken. In de linkerwand is bovenin een raam, linksonder staat een tafel. In het midden zie je een jonge vrouw. Ze schenkt melk vanuit een kan in een kom die op tafel staat. Het schilderij is erg beroemd door de alledaagse voorstelling, de compositie en het licht."

Je besluit dat je meer wilt weten en pakt het koffertje naast het schilderij. Je loopt naar een bankje en gaat zitten om het beeld verder te onderzoeken.

Test begint

**Test a*

De koffer bevat een reliëf van het schilderij. De audioknop om de gids te laten starten bevindt zich links.

"Voor je ligt het Melkmeisje van Johannes Vermeer. Wanneer je met twee handen over het schilderij beweegt, voel je de voorstelling. De meid staat in het midden, linksboven is het raam en linksonder bevindt zich de tafel. Een belangrijk onderdeel van het schilderij is de kan van waaruit melk geschonken wordt. Deze bevindt zich voor het meisje, boven de tafel. "

**Hoogte erop leggen. Als ie gevonden is verhaaltje over de pot*

"Je kijkt in de pot. Het straaltje melk dat eruit komt is het enige dat op het

schilderij lijkt te bewegen."

Wat vindt je ervan dat de pot nu verhoogd is? Maakt dit het makkelijker om de vorm te voelen?

**Andere hoogten proberen, zelfde vragen*

Test a is afgelopen, we gaan nu naar **test b**. Hiervoor is een detail uit het schilderij gehaald. De audio guide gaat verder.

"We gaan nog even terug naar de pot. Voel je de pot? De straal van de pot mondt uit in een schaal die op tafel staat. Deze bevindt zich achter een aantal broden en staat op de rand."

Wat vind je van trilling als feedback? Maakt het de vorm herkenbaar? Hoe vind je dit in vergelijking met de verhoging?

We gaan nu verder met **test c. Hiervoor krijg je een andere vorm van voelschilderij.*

Om deze vorm te onderzoeken heb je een extra elementje nodig, het is een magneetje, je moet hem zo vasthouden.

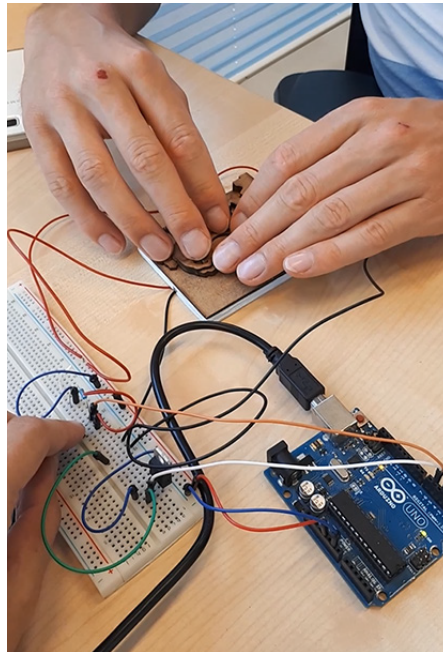
Wat vindt je van deze manier van begeleiding?

Welk van de drie manieren spreekt je het meest aan? Waarom?

Andere op of aanmerkingen?



*Image 2.9a:
Height prototype in use*



*Image 2.9b:
Vibration prototype in use*



*Image 2.9c:
Magnet prototype in use*

C14. Results interaction test

Here, the most important test results will be stated as proof of the main results and the conclusion.

General observations

When feeling the relief for the first time, the participants needed time to explore the artwork. It's a lot to process.

Participants start feeling very close to themselves. They often seemed uncomfortable reaching out.

Many participants mentioned the relation between the pot and the rest of the artwork, directly or indirectly.

'I prefer that the part is both highlighted and part of the context' **8**

'Where is the girl? How is she holding it?' **6**



Direct (3/8)



Indirect (3/8)

The lighter colour shows the amount of participants that stated or were observed for a particular statement. Blue charts are positive, green negative statements.

Note: For the statements, this indicates the participants that actually mentioned it. This doesn't necessarily mean that other participants mentioned the opposite.

Height

Most of the participants were able to find the object in the audio.

'Provides security and prevents guessing'

4

'Makes clear something is there' **7**



Able to localize object (6/8)

Elevation works to get a better understanding of shape and/or detail.

'Elevation makes the shape better recognizable' **4**

'The shape is easier to feel, because the edges of other objects aren't in the way' **8**

'I feel that you are looking into the pot' **3**

'Height allows to feel more detail' **7**



Shape (5/8)



Detail (4/8)

Vibration

Vibration works well for localizing and feedback

'It has extra value for finding the right spot' 1

'It tells you where your attention should go' 2

'It makes clear what to pay attention to' 7
'Instead of guessing, you know that you are at the right spot' 8



Localizing (7/8)



Feedback (3/8)

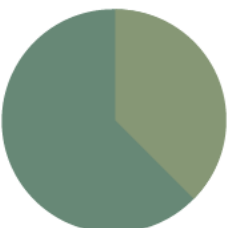
Feeling the shape of the object became difficult for some, helpful for others.

'It's distracting to feel the shape' 4

'Your fingers numb a bit' 8

'The vibrating parts are the object' 6

'It leaves out distraction' 7



Difficult (3/8)

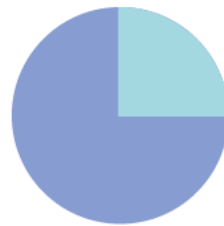


Helpful (2/8)

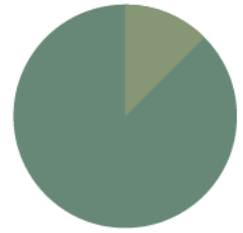
The sound was mentioned a couple of times, both positive and negative

'I like that the sound changes when you touch it, this gives feedback as well' 8

'The sound is very annoying. It's mechanical and it changes' 4



Positive (2/8)



Negative (1/8)

Height vs. Vibration

Half of the participants specifically mentioned vibration over height

'The artwork remains a whole' 2

'When more subtle, I think it's clearer than the elevation' 4

'I liked vibration the best. You go looking for it.' 6



Vibration better (4/8)

Magnet

The guidance by magnet was helpful for all participants, except one, due to focus and it being easy to follow

'It helps you to get your attention to the right spot' **2**

'Nice to know where you are' **6**

'You don't have to search anymore' **5**

'I could pay attention to the story, because I didn't have to think about the hand' **8**



Focus (3/8)

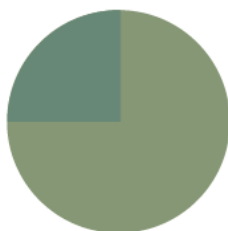


Easy to follow (3/8)

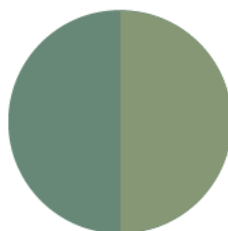
Most participants didn't start exploring the surface until being told to do so

Also half of the participants went back to the magnet quickly

'I have the feeling I'm missing something when I let go of the magnet' **2**



Not exploring (6/8)

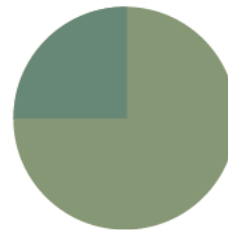


Quickly back (4/8)

Most of the participants thought the magnet was a barrier between them and the work

'I wanted to feel the shape with my finger, now the magnet was in the way' **5**

'Details are missing when feeling through the magnet' **8**



Barrier (6/8)

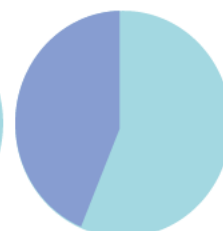
Preferences

Being guided by the magnet was chosen the least. Most participants preferred vibration. One participant who during the test mentioned vibration over height switched back to height at the end.

One participant was divided between magnet and vibration.



Height (3/8)



Vibration (4.5/8)



Magnet (0.5/8)

Relief

For most, the relief provided more information

'With the relief, it's easier to feel the pot and bowl' 1

'It gives a sense of front and back' 3

'I could explore by myself more when feeling the relief' 4



Relief more
informative (5/8)

Materials

The materials sometimes helped for identification of the objects (5/8)

'Maybe it's helpful with the skirt, because fabric represents clothing' 1

'It makes you more sure with what you are feeling' 2



Object identification
(5/8)

By some, the materials aren't understood or don't match expectations (4/8)

'I didn't think the skirt to be so woolly' 3

'I have no idea of what kind of materials the structures are supposed to suggest' 4



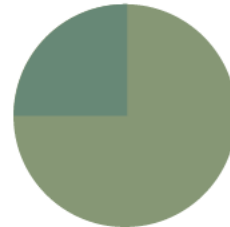
Materials
misunderstood (4/8)

Feeling the shape is difficult (6/8)

'It's not clear enough, there isn't enough difference between the materials' 1

'It's hard to establish form, hard to create an image' 2

'It's hard to feel where the textures stop' 4



Shape difficult (6/8)

Combination

Some would like to have a combination of form and texture

'I would like both of form and texture' 2

'I would like soft skin, so you can feel it's an organic shape' 5

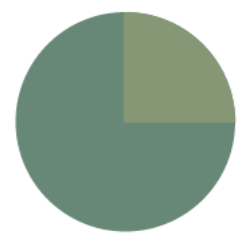
For others this wouldn't be helpful

'Both might be too much' 1

'A combination would be double' 4



Want combination
(3/8)



Don't want
combination (2/8)

C15. Memories of 'the Milkmaid'

Participant 1

A girl in a dress, with a white cap on her head and an apron.
There is a window. She's doing laundry? There is an old milk bottle.

Participant 2

There is blue somewhere.
The girl is standing on the left. She has a kid on her shoulder maybe?
Probably a pot with milk, for us on the right
She is staring neutral and dreamy ahead of her
There is a window on the left, on the right is a dark/domestic space. Maybe a cabinet or table

Participant 3

She wears something blue. She stands bent over in a field.
She has a white cap, a yellow/blue dress. There is a stark air
Maybe she's inside.. No she's on a field.
Of course she is wearing wooden shoes

Participant 4

A woman with a veil. Blue shades.
She holds a bottle of milk in her hand.
There is yellow and brown. The background is dark.
There is a window

Participant 5

(has seen it recently)
A woman in a yellow/blue dress
She holds a brown pot with white milk.
I don't know where she pours it in.
She stands left next to a window, which isn't visible.
There is a table with stuff on it

Participant 6 & 7

Both gave a pretty accurate description of the artwork

Participant 8

A woman with a skirt and a white apron
She has a cap and a pot with milk.
It's dark. She pours into something on the table.
She wears blue/yellow clothing

C16. Results test vibration prototypes

Results of the vibration isolation prototypes

Prototype 1

Works very well. Very silent. Starts to make noise when wood touches each other, might need a 'bumper'.

Make sure part has enough support material, otherwise it is very loose.

It is maybe the least stable model.

When the whole prototype is placed on a silicon underground, the prototype is less effective.

Prototype 2

Still the other parts vibrate along very firmly.

A ground of floor isolation material does seem to work: the other parts still vibrate, although less.

A lower level of vibration seems to work better.

Prototype 3

Also here, everything vibrates

A ground of floor isolation material seems to work, but less then with the previous prototype

Insights/conclusions

Prototype 3 is the least effective.

The parts have to be separated from each other for the best result.

The model needs flexible (silicone?) between the top and bottom part.

When this is at the vibrating part only, the vibrations are very effective in one place.

Also effective, but more stable is silicon bars that connect the parts to the bottom and to the solid base.

Gluing silicone is nearly impossible.

Also, all prototypes still vibrate to the side. It is essential to only touch the top layer

C17. Arduino code

```
#include <Event.h>
#include <Timer.h>

/*
https://github.com/JChristensen/Timer
1. Download https://github.com/JChristensen/Timer/archive/v2.1.zip
2/ (In the Arduino IDE) Sketch > Include Library > Add
.ZIP Library > select the downloaded file > Open
*/

Timer t;
long secCount;
int iState; /* 0 = Stopped, 1 = paused, 2 = run */
const int trilMotor1Pin = 9;
const int trilMotor2Pin = 6;
const int trilMotor3Pin = 5;
const int trilMotor4Pin = 3;

void setup() {
  Serial.begin(9600);
  int secEvent = t.every(1000, HandleSecEvent,
(void*) 0);
  secCount = 0;
  iState = 0;
  pinMode(trilMotor1Pin, OUTPUT);
  pinMode(trilMotor2Pin, OUTPUT);
  pinMode(trilMotor3Pin, OUTPUT);
  pinMode(trilMotor4Pin, OUTPUT);
}

void loop() {
  t.update();
  Serial.print(secCount);

  if (Serial.available() > 0) {
    int iCmdInput = Serial.read();
    switch (iCmdInput) {
      case 'S':
        iState = 2;
        break;
      case 'P':
        iState = 1;
        break;
      case 'E':
        iState = 0;
        secCount = 0;
        break;
      default:
        break;
    }
  }
}
```

```
// Determine actuator activation based on narrative
if (secCount > 0 and secCount < 4) {
  analogWrite(trilMotor1Pin, 155);
  analogWrite(trilMotor2Pin, 155);
  analogWrite(trilMotor3Pin, 155);
  analogWrite(trilMotor4Pin, 155);
}

if (secCount > 76 and secCount < 83) {
  analogWrite(trilMotor1Pin, 155);
  analogWrite(trilMotor2Pin, 255);
  analogWrite(trilMotor3Pin, 255);
  analogWrite(trilMotor4Pin, 255);
}

else if (secCount > 121 and secCount < 128) {
  analogWrite(trilMotor1Pin, 255);
  analogWrite(trilMotor2Pin, 155);
  analogWrite(trilMotor3Pin, 255);
  analogWrite(trilMotor4Pin, 255);
}

else if (secCount > 147 and secCount < 154) {
  analogWrite(trilMotor1Pin, 255);
  analogWrite(trilMotor2Pin, 255);
  analogWrite(trilMotor3Pin, 155);
  analogWrite(trilMotor4Pin, 255);
}

else if (secCount > 209 and secCount < 217) {
  analogWrite(trilMotor1Pin, 255);
  analogWrite(trilMotor2Pin, 255);
  analogWrite(trilMotor3Pin, 255);
  analogWrite(trilMotor4Pin, 150);
}

else {
  analogWrite(trilMotor1Pin, 255);
  analogWrite(trilMotor2Pin, 255);
  analogWrite(trilMotor3Pin, 255);
  analogWrite(trilMotor4Pin, 255);
}

void HandleSecEvent()
{
  // only increment when in run mode
  if (iState < 2) return;
  // increment second counter
  secCount += 1;
}
```

C18. Storytelling guidelines

Who is the audience *and what they are looking for*

Above all, the audience is museum visitors. According to the research, they are looking for a new story, possibly with depth. Furthermore, they are interested in the details and their meaning within the art, the background of the artist and multiple viewpoints upon the story. The exact interests can be determined through preparation at home or at the counter.

Still, the visual impairment plays a part. It needs to be clear for the visually impaired visitor what is and isn't on the image. The story has to be clear, well-structured and not too detailed. It has to be 'visually' told, using references to well-known objects and phenomena.

Last, the context is important for the way of storytelling, as it will take place during a museum visit. The visitor is on its own while being guided through a physical representation of the artwork.

Goal *and reason for telling the story*

First, the goal is to let museum visitors with a visual impairment form an opinion about a particular artwork. Therefore, the second goal is to make the image accessible to them, almost literally painting them a picture by bringing the artwork to life through audio and touch. This starts with form and composition, then informing and possibly teaching about the background of the art, artist, timeframe etcetera are the goals, as this appeared to be what they want to know.

Why is it interesting *or what makes the story matter?*

At the beginning of the story, the listener should be engaged and made curious. Something happened which made the work worth to be placed in the museum. When part of a tour, the relation with the other artworks could be discussed, while for the artwork itself the interesting features and what it did for its time, style or artist could be discussed.

Think about priority

Not every detail has to be conveyed to the visitor. People with normal vision never note this either. The artwork was designed to be looked at. Therefore, it might be good to track what people see, what they see first and what they don't notice at all. Asking them afterwards what they remember from the work can also be a good way to indicate the most important features of it. On the other hand, it might be also interesting to state the 'hidden' details and meaning. From research these kind of facts and jokes appeared to be interesting.

Engage the visitor

Not only during the beginning, but throughout the whole story the visitor should be engaged. This means that it shouldn't be a dry enumeration of all the elements that make the work, but that the visitor should be part of the story. This can be done by sketching the scene, raising questions and answering them or let the visitor answer them (in their minds). Furthermore, the story should be told lively, intonated and with visual descriptions.

Place the work in perspective

An artwork does not stand on itself. It is often part of a bigger story. Here, the stages can return: what challenge did the work solve or maybe create? Who or what changed because of the work? This highly depends on the work. The 'hero' can be different according to it (the artist, person in the art, spectators of the time etc.).

Besides that, one can look at the art work from multiple perspectives, through different 'glasses'. This is preferred by the visitors and can be connected to the different layers of the work.

Involve the tactile sense

The visitor is feeling the art while the story is being told, so what they are feeling should be involved directly. There should be relations and explanations between what they feel and what it could mean. It should be clear to the visitor what is part of the work and what isn't. They should also be given some space to explore themselves and decide what is or isn't interesting.

Close the story properly

It's important to not randomly end the story out of nowhere. Find a proper way to close it. Don't leave open questions and make sure the promises from the beginning of the story are fulfilled.

Questions can be left open as link forwards to a next artwork (when in a tour) or if the work is questioning.

Standaardinformatie

Dit is een representatie van "het Melkmeisje" van Johannes Vermeer. Het is een realistisch schilderij, geschilderd rond 1660 met olieverf op doek. Om de afbeelding zit een lijst, deze is niet hetzelfde als in het museum. Ga met je vingers langs de randen van het schilderij zelf. Het is 41 centimeter breed en bijna 46 centimeter lang.

Afbeelding

We beginnen met de basis laag: wat er op het schilderij is afgebeeld. U krijgt nu een korte omschrijving van de afbeelding, daarna gaan we er dieper op in. We kijken in een 17e eeuwse souterrain, waarvan je enkel de linker- en achterwand ziet. Iets rechts van het midden bevindt zich een keukenmeid, linksvoor op het schilderij staat een tafel, onder het raam. Het melkmeisje staat schuin achter deze tafel naar ons toegekeerd, zichtbaar van knieën tot hoofd. Ze houdt een bruin aardewerken kan vast waar melk uitstroomt, vandaar het Melkmeisje. *Waar Vermeer begon met het schilderen van Bijbelse en mythologische voorstellingen, verlegde hij zijn koers al snel naar scènes uit het dagelijks leven, Een onderwerp waar de Nederlandse schilderkunst uit de 17de eeuw beroemd om zou worden.

Wanneer je je handen iets boven het midden van het schilderij beweegt, vindt je haar gezicht, omgeven door een kapje. Dit onderdeel trilt nu. **Kreuken van doek**. Het gezicht is een van de eerste elementen die opvallen wanneer je naar het schilderij kijkt. Het is een stevige jonge vrouw met eenvoudige, doch kleurrijke kleding en om haar gezicht een simpel wit kapje. Ze heeft haar hoofd voor de kijker iets naar rechts gekanteld. Haar rustige, geconcentreerde blik is gericht op de kan in haar handen, haar ogen lijken gesloten. Wanneer je haar kijkrichting volgt, wordt je als vanzelf richting de kan getrokken. Wanneer je je hand naar beneden beweegt, kun je haar rechterarm volgen naar de kan waar melk uit stroomt. Haar onderarm bevindt zich horizontaal, haar hand ondersteunt de kan. De kan zal nu trillen. **Tikken tegen kleien pot**. Het is een roodbruine kan gemaakt van klei. Het meisje houdt hem naar je toe, je kijkt er dus in, al zie je niets door de schaduw die zich in de kan bevindt. Uit de kan stroomt een straaltje melk, het enige dat lijkt te bewegen op het schilderij.

De melk uit de kan stroomt in een schaal die op tafel staat, deze trilt nu. *Stromende melk.* De schaal bevindt zich achter een aantal broden die voor de schaal op tafel liggen. Verder op de tafel staan links van de schaal een blauwe Keulse kan en daarvoor een mand met brood. *De voorwerpen op tafel laten de bekwaamheid van Vermeer zien, alsook zijn fenomenale lichtweergave. Het brood bestaat uit kleine kleurstipjes naast elkaar, die de suggestie van een knapperige korst geven.

We verlaten nu de tafel. Linksboven in de hoek bevindt zich een raam. Een van de ruitjes is kapot, waardoor net iets meer licht naar binnen valt.

Straatgeluiden. De bijzonder goed weergegeven lichtinval is een van de belangrijkste elementen waardoor dit schilderij zo beroemd is. Rechts onderin de ruimte bevindt zich een stoof. Deze trilt nu. *Knetterend vuurtje.* De stoof is in perspectief getekend. Hij staat gedraaid, waardoor er een zeshoek is ontstaan. Het is in feite een kubus. De rechterzijde is open. Hierin zie je een potje met hete kolen. Aangezien bepaalde ruimtes lastig warm te krijgen waren, werden deze houten huisjes vaak gebruikt om de voeten en het onderlichaam te verwarmen. Ze komen op veel Hollandse schilderijen voor.

Je hebt nu de afbeelding op het schilderij verkend. We gaan verder met het interview.

Introductie

Vooraf

Goedemiddag! Mijn naam is Hester de Blik, ik studeer Interactie ontwerpen aan de TU Delft, een specialisatie van Industrieel ontwerpen. Ik werk samen met het Rijksmuseum om de museumbeleving toegankelijk te maken voor blinde en slechtziende bezoekers. Hiervoor wil ik het mogelijk maken om als bezoeker individueel de schilderijen te begrijpen. Daarom heb ik een concept bedacht, wat ik graag met u wil uitproberen. Ik wil graag uw eerlijke feedback hierop, zodat ik het kan verbeteren. Dit staat ook vermeld op dit formulier. Vindt u het goed dat ik beeld en geluidsopnames maak om uw feedback later te kunnen analyseren? Deze worden alleen gebruikt voor het analyseren van dit concept en uw informatie wordt vertrouwelijk en anoniem behandeld.

Test uitleg en planning

De test zal als volgt gaan: We beginnen met een korte inleiding. Hierna volgt uitleg van het concept. Dan kunt u het prototype ervaren. Dit is echter wel een verkorte versie van het verhaal in verband met de tijd. Als laatste zal ik u een aantal vragen stellen over uw ervaring.

Toekomstbeeld

Goed, dan gaan we beginnen met een toekomstbeeld. Stelt u zich voor dat u zelf door het museum rond kunt lopen terwijl u informatie krijgt over de schilderijen om u heen. Op een gegeven moment bevindt u zich op de eregalerij bij het Melkmeisje van Johannes Vermeer en wilt hier meer over weten. U neemt de representatie (dit concept) en gaat op een bankje in de buurt zitten.

Uitleg prototype

Hier begint onze test. Het prototype ligt voor u op tafel. Het is een representatie gebaseerd op het schilderij het Melkmeisje. (Heeft u hier al voorkennis van? Welke?) Het prototype bestaat uit een voelbaar reliëf van dit schilderij met hoogteverschillen, waarvan bepaalde onderdelen kunnen trillen. U zult door het schilderij geleid worden door middel van audio uitleg. Het doel hiervan is om de afbeelding te begrijpen en de verhoudingen van de elementen ten opzichte van elkaar.

Als u er klaar voor bent kunnen we beginnen.

As the interviewees were all Dutch native speakers, the interviews were held in Dutch as well. These questions formed the guidelines for the semi-structured interviews afterwards. The three topics, prototype, before and layered exploration, were always present.

Thank you for participating. I now have a couple of questions for you:

Prototype

- Hoe is uw idee van de afbeelding op het schilderij?
 - o Kunt u zich een voorstelling vormen? Waarom wel/niet?
- Wat vindt u van de manier waarop u door het schilderij geleid werd?
 - o Hoe ervaarde u de combinatie van reliëf, audio en trilling?
 - o Kunt u hiervan een voorbeeld geven?
- Had u vragen tijdens het gebruik?

- Zou dit concept in een individueel museumbezoek passen?
 - o Had u het idee dat u hulp nodig had? Waarbij?
 - o Waarom wel / niet?

C22. Test results

Here displayed are the most important statements out of the the tests, grouped into categories. The six colours represent the six different participants.



STORY

I would like to listen back a bit, what did you say exactly?

What about the stove? Did you have a fire sound? Oh I lost that, can I hear it again?

What about the other arm? That one is way smaller (*because of foreshortening)

It's explained well

The pace is fine

I didn't get her face, I thought you saw her from the side. Maybe you can mention the nose in the middle

I was confused, she is looking at the right, but for me that's left right? That confused me twice

Maybe say: left, for the viewer right

For me, it wasn't clear that we went from top left (window) to down right (stove). I might have missed something

With the bread, you talk about dots and you feel dots, that works well

It helps tremendously that you can really feel what is being told (relief)

It's hard for me sometimes to combine visually impaired and normal vision

I would like that someone can listen with you. It's nice to be able to do this together

*Doesn't explore during the overview of the work

*Also only starts when this is stated within the audio

SOUNDS

I liked the sounds in between

The other sounds are complementary (bread and milk)

The sounds in between were very funny. From the window, milk and bread. It made you get into the atmosphere of that time

The crackling of the bread made it very lively

I thought the birds were cool. Nice, milk in a tray, crackling bread

I think the ambience sounds could be executed better. For instance it's now like you open the window, while the sound should be there the whole time

I also couldn't define the bread well. And with the milk, I would expect a fuller sound

Which other sounds could be there.. The space? It's all stone, so should have loud acoustics

Maybe you can add scent? It makes you get the atmosphere so well

Maybe the sound of her breathing, then you are all alone with just one person

At the window, you talk about the lighting, but you hear sounds from outside, that seems odd

VIBRATION

I thought the vibration was funny and clarifying. Everything that had to vibrate vibrated.

I like the vibration, it ensures you are at the right place

I can still see quite a lot, only not that long, so sometimes the vibration wasn't necessary

I think the vibration is working very nicely. Your fingers are being guided

The vibration is an extra support to prevent you from getting lost

Without the vibration, I would have to look very closely. I can't see exactly what's there, so it helps

Here with the pot it's dark, so not easy to see, then the vibration was useful

It vibrates slightly throughout the whole surface, so I can find it easily

I had to get used to the vibration, to know how it's supposed to feel

RELIEF

First impression: Special. I immediately liked the relief, before I knew about the vibration

I love that you can feel

You feel the reliefs and the relations very well

I like the face, the exaggerated parts work well

I think the pot and the bread are very clear

I have felt Van Gogh's replica's, but with the brush strokes only, I can't form an image

With the Nightwatch, we had to imagine. You think, you step into the border, but this would make it more real

You can describe something, but then you still don't know exactly what is where

I would make the relief one or two millimeter higher, to make it more clear

I would like it to be more towards 3D

Her mutch and the stove are less clear to me

I can't feel the cloth over the table well, could be clearer

The window isn't very clear

I couldn't find the window, it was unclear.

The window isn't very clear

I can't feel the window

The relief isn't equally clear everywhere.

I've felt the face in sand, there it was more clear (cheeks etc.) Maybe you could do this differently in the final design

If I wasn't able to see anything, I would wonder where the arm is exactly. You want to say something, so make it more clear