IMPROVING VISITOR FLOW AT THE VAN GOGH MUSEUM

TOWARDS A BETTER MUSEUM EXPERIENCE

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Colophon

Improving visitor flow at the Van Gogh Museum: Towards a better museum experience.
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Executive summary

This report documents a graduation project for the master Design for Interaction at the faculty of Industrial Design Engineering at the TU Delft. It describes the process of designing a concept for a personalized multimedia guide system for the Van Gogh Museum in Amsterdam, the Netherlands. The design enables the Van Gogh Museum to enhance the visitor experience and visitor flow within the museum.

Context

In 2017, the Van Gogh Museum was the most popular museum in the Netherlands. The museum however, is located in a rather small building, which results in crowded situations around the most popular paintings in the collection which can result in a negative influence on the visitor experience.

Currently the Van Gogh Museum has a multimedia guide system in place that is built as an application on custom android devices. This means these devices are able to connect through various wireless systems and can run advanced software.

Visitor behavior

Visitors to the Van Gogh Museum come from all over the world and all bring their own culture, needs and biases to the museum. Furthermore, a museum visit is a highly personal experience which is, for a large part, formed by the goals visitors want to achieve during their visit.

The time visitors spend in a museum exhibition can generally be split into two activities: the act of looking at objects and roaming time. Roaming time can be further defined as ineffective- or effective-roaming time. Roaming time is ineffective when time is spent on practicalities like orienting in the museum space, and navigating the galleries, planning the next move and waiting in line. Effective roaming time is used by visitors in the form of thinking or talking to their visiting group to process the information visitors just received at an object.

Theory describes a phase model which describes the way visitors interact with museum environments. This phase model consists of four phases. During the orientation phase visitors try to make sense of the people, objects, paths and architecture of the museum. Interacting with art starts with the intensive looking phase in which visitors focus all their attention on the exhibition they encounter and the roaming time is mostly effective. The need to give every part of the exhibition great attention is large. After a roughly 50 minutes, visitors realize they are not able to see every part of the exhibition in detail and they start the exhibition cruising phase. During this phase visitors still want to see every part of the exhibition but do not give every object their full attention. Visitors are more selective in what objects they choose to engage with and the roaming time is more ineffective. The final phase of a museum visit consists of leave-taking in which visitors find the exit of the museum.

The presence of these visitor behavior theories in the Van Gogh Museum was evaluated during observations and interviews in the museum.

Design brief

In the current scenario at the museum all follow the chronological story of the exhibition. Resulting in all visitors entering the intensive looking phase at the same time in the same place and ending with the cruising phase in the same place. This creates a noticeable queue at the beginning of the exhibition.

Spreading the visitor phases around the museum will result in a mix of visitors that are both intensive looking and cruising. Based on literature research the assumption is that this will increase the average speed of the visitor flow in the first galleries, since not all visitors feel the urge to look at every object in detail, and will slow the average flow near the end of the exhibition, since not all visitors are in their cruising phase. This will result in a more balanced visitor pressure in the museum.

Because the switch between the intensive looking and cruising phases lies in the middle of the storyline of the exhibition, telling the story as a reverse chronological story will provide the

necessary spreading of visiting phases. In such a reverse chronological story, visitors would discover the origin of Vincent Van Gogh.

A short design intervention provided the insight that visitors should be provided with the option of making a meaningful choice at the start of their museum visit.

Final design

The final design concept consists of a interactive surface which would be placed at the beginning of the exhibition. Visitors could use this surface to personalize their own multimedia guide. This personalizing is done by adding topic related content to an existing story structure, which ensures all visitors follow a logical story through the exhibition but receive additional content on topics they find interesting.

The design would makes use of the different goals of visitors by letting visitors compose a unique and meaningful museum visit that fits their personal goals. Since visitors have composed a museum visit themselves, the museum would have the opportunity to create an optimized visiting path for each visitor, while keeping in mind both the experience of the visitor and the available capacity throughout the museum.

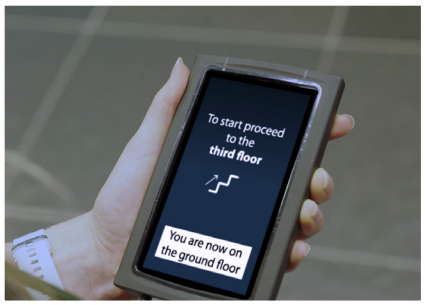
Visitors would have the ability to choose what information they want to receive, the museum decides where, when and how this information is provided.

Evaluation

The design was evaluated during a user test with 10 museum visitors in five visitor groups. Together with the literature research on the topic of visitor phases, these tests proved the potential of the design for a positive impact on both the visiting experience and the visitor flow.

The design will form a recognizable beginning of the exhibition

Creating a unique museum visit for a better experience



Receiving meaningful directions to improve the visitor flow

Figure 1. The exterior of the Van Gogh Museum.

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Figure 2. The entrance hall of the Van Gogh Museum

Introduction

This graduation report describes the process of designing a concept for a personalized multimedia guide system for the Van Gogh Museum. The graduation was part of the master Design for Interaction at the faculty of Industrial Design Engineering at the TU Delft.

The Van Gogh Museum opened in 1973 and houses a large permanent exhibition that features the largest collection of Van Gogh paintings and drawings in the world as well as a space for temporary exhibitions. In 2017 the museum received 2,26 million visitors, which makes it the most visited museum in the Netherlands (Van Gogh Museum, 2017f).

As the most popular museum in The Netherlands (Van Gogh Museum, 2017f), the Van Gogh Museum attracts a large number of visitors. The exhibition however, is located in a building that is quite small relative to the number of visitors it hosts. The museum can handle this large number of visitors, but in during peak moments the number of visitors can results in crowded situations around the most popular paintings of the collection, in narrow passages and at the start of the exhibition. This can result in a negative influence on the experience of the visitors.

The goal of this project is to improve the visitor experience by improving the visitor flow through the museum. Because of the graduate student's personal interest and the work field of the mentor within the Van Gogh Museum, this assignment will focus on designing a digital media solution. This design can consist of any form or combination of audio, video, web or application.

Design a digital media solution that can improve the visitor experience at the Van Gogh Museum by improving the visitor flow through the permanent exhibition galleries of the museum.

The Van Gogh Museum

The Van Gogh Museum is an art museum located in Amsterdam, the Netherlands. The museum is dedicated to the works of Vincent Van Gogh and his contemporaries. The museum is located at the museum square close to the Rijksmuseum and Stedelijk museum. The museum houses a permanent exhibition, which features the largest collection of Van Gogh paintings and drawings in the world, as well as a temporary exhibition space that houses exhibitions related to Van Gogh.

Mission statement of the Van Gogh Museum

The mission statement of the Van Gogh Museum is to:

'Make the life and work of Vincent Van Gogh and the art of his time accessible and reach as many people as possible in order to enrich and inspire them.

Figure 3. Mission statement of the Van Gogh Museum (Van Gogh Museum, 2018b).

This mission means the museum wants to reach a wide group of people of all different ages and nationalities. This includes people with a disability. The museum aims to enrich its target group. This is done by allowing visitors to see and "experience" the works and by providing additional information through guided tours, brochures, websites, applications and the multimedia guide. To best reach all target groups the museum invests in materials that are personalized to the visitor. The museum has, for instance, developed special guided tours for kids and extra in-depth tours for art lovers as well as the development of different multimedia guides.

Optimizing the use of exposition space

One of the ambition of the Van Gogh Museum is to move towards an automated system that can optimize the use of the capacity of the museum. This will require detecting the visitor density in real time at specific areas of the exhibition and changing digital content like displays in the exhibition or the content of the multimedia guide (see page 13 for a description of the multimedia guide) accordingly.

For detecting visitors an indoor positioning system can be used. An analysis of the possibilities for an indoor positioning system and the use in the museum sector can be found in Appendix C.

Figure 4: The Rietveld building during the "Vincent on Friday" event.

Building

In 1973 the museum opened in the main building which was designed by Rietveld (Figure 4). This building houses the permanent exhibition of the museum. After several construction projects like the restaurant and an addition of several offices, the museum was expanded in 1999 with the exhibition wing designed by Kisho Kurokawa. In 2015 the museum was expanded again with the construction of the new entrance hall (Figure 2) (Van Gogh Museum, 2017a). This resulted in a total museum surface area of 15.175m2 (Van Gogh Museum, 2015b), of which 2.420m2 is currently used by the permanent exhibition. A cross section of the current museum building can be found in Figure 6.

When compared to the other big museums at the museum square in Amsterdam, the Rijksmuseum and the Stedelijk museum, it becomes clear the Van Gogh Museum is a busy museum (Figure 5).

Museum	Exhibition area (m2)	Visitors in 2016
Van Gogh Museum	2.420	2.260.000 (Van Gogh Museum, 2017f)
Rijksmuseum	14.500 (Rijksmuseum, 2013)	2.160.000 (Rijksmuseum, 2018)
Stedelijk Museum	8.000 (Stedelijk Museum Amsterdam, 2012)	650.000 (Stedelijk Museum Amsterdam, 2017)

Figure 5. The exhibition area and visitor numbers of different museums in Amsterdam.

Figure 6. Cross section of the Van Gogh Museum building with names of the sections.

Exhibitions

The permanent exhibition of the Van Gogh Museum is located in the original building designed by Rietveld. The exhibition follows the different phases of the career of Van Gogh and is set up as a chronological story. The exhibition starts at the ground floor (Figure 9) and works its way up the building to the third floor where the last paintings of Van Gogh are displayed.

The temporary exhibition wing is used for themed exhibitions of which the Van Gogh Museum houses around three per year. (Van Gogh Museum, 2018c).

Figure 7. First floor of the Rietveld building.

Figure 8. First floor of the Rietveld building, the 'schatkamer'.

Figure 9. Ground floor of the Rietveld building. The start of the permanent exhibition.

Multimedia guide

To complement the visitor experience in the museum, the Van Gogh Museum has developed a multimedia guide (Figure 11). The aim of this guide is to serve as an educational platform that inspires visitors by providing more information and context to some of the paintings in the main and temporary collection. The focus of the multimedia guide is to let first time visitors take a closer look at the work of Van Gogh and to show a Van Gogh they have never seen before.

To better connect the multimedia guide to different types of visitors three versions of the multimedia guide have been developed. The highlight tour, the leisure tour and a family tour. Both the highlight tour and the leisure tour are available in 11 languages (Mandarin Chinese, German, English, Spanish, French, Portuguese, Italian, Japanese, Korean, Dutch and Russian). The family tour is only available in Dutch and English.

For each temporary exhibition separate multimedia guide content is developed which is available through the exhibitions own multimedia guide tour.

In 2017 an average of 26% of the visitor chose to use a multimedia guide during their visit (Van Gogh Museum, 2017b).

The multimedia guide is a paid service for visitors and currently costs € 5 per device.

Highlight tour

The highlight tour focuses on visitors that want a quick look at the most important pieces of the collection. This tour guides people around the museum in roughly 45 minutes. The paintings are displayed as a list which visitors can follow (Figure 16). This will lead them in a logical order through the museum.

Leisure tour

The leisure tour lets visitors roam around freely within the exhibition and ask the application for more information when they please. During this tour visitors have to manually enter the number of the painting they want to receive more information about (Figure 13). A leisure tour takes on average 90 minutes to complete.

Family tour

The family tour can best be described as a treasure hunt. This tour is designed to be followed as a group (children and their caretakers). During the tour each member of the group gets a different hint for a certain painting. Together they have to find the painting after which they receive information about the work. The tour is highly interactive and uses games and questions.

Figure 10. Wheatfield with Crows with a label and multimedia stop number.

Figure 11. The multimedia guide

Using the multimedia guide

When using the multimedia guide visitors first have to select the tour they want to follow (Figure 12). When visitors choose to follow the leisure tour they will be presented with a circle on which they can select the number of the painting they are standing at (Figure 13). These numbers are displayed above the labels of the paintings (Figure 10). A painting with an audio fragment is called a *multimedia stop*. One multimedia stop can consist of several segments.

When visitors decide to follow the highlight tour, a different way of selecting a multimedia stop is used (Figure 16). This screen shows a list of all highlights grouped by floor and arranged so that the first painting visitors will encounter is at the top of the list.

When visitors have selected a multimedia stop in either the leisure or the highlight tour, the screen briefly shows all segments available (Figure 14) after which the first segment is opened and played (Figure 15).

While a segment is played the screen deliberately shows little information. The only displayed information is the progress of the audio fragment and controls for pausing and moving through the segments (Figure 15). Some of the available segments have visual information that is displayed on the screen of the multimedia guide.

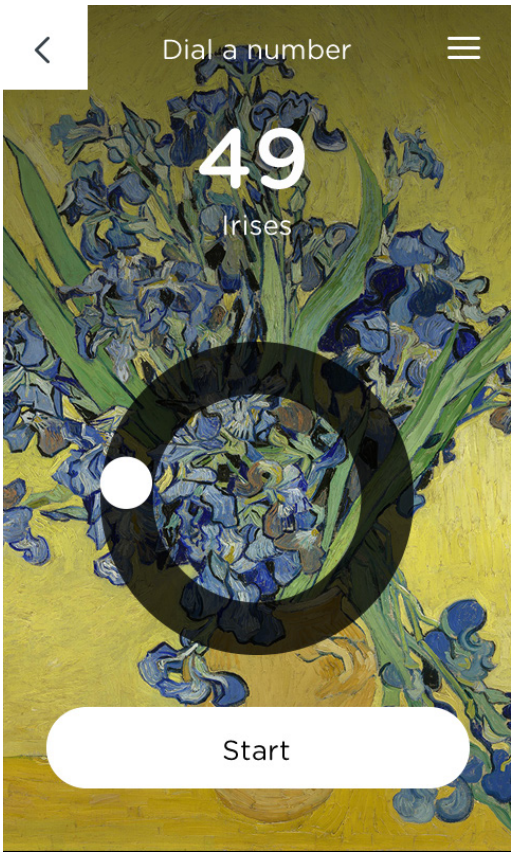


Figure 13. Leisure tour selection screen.

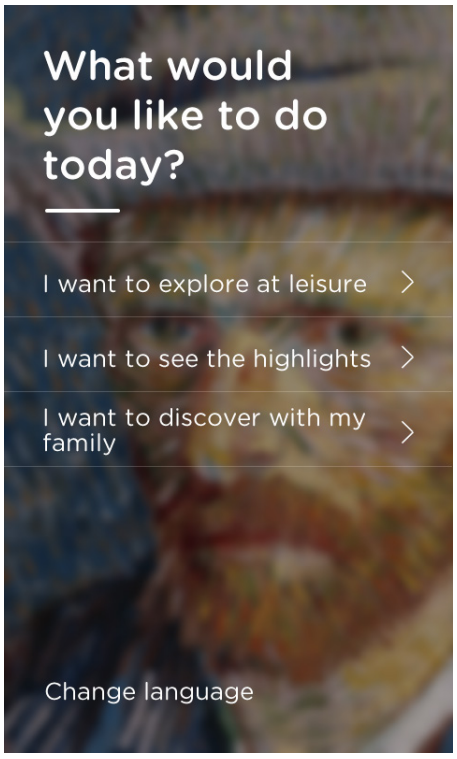


Figure 12. Tour selection screen.

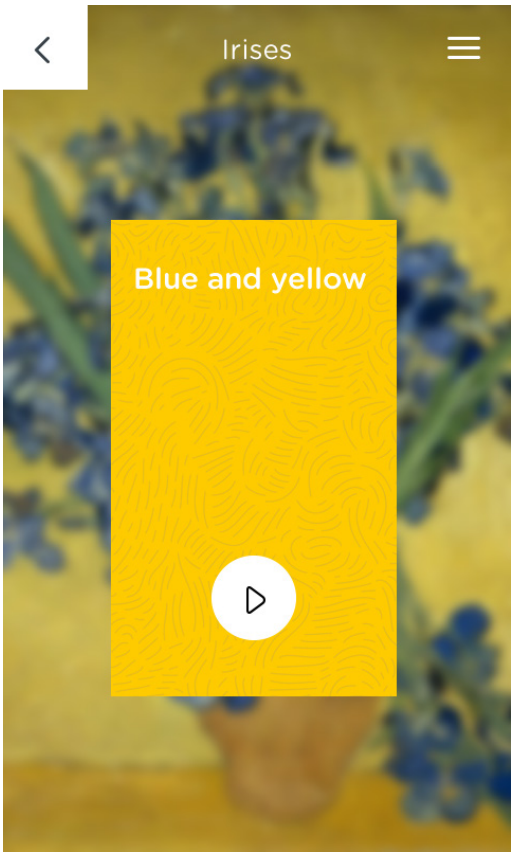


Figure 14. Overview of the segments.

Figure 15. Playing screen.

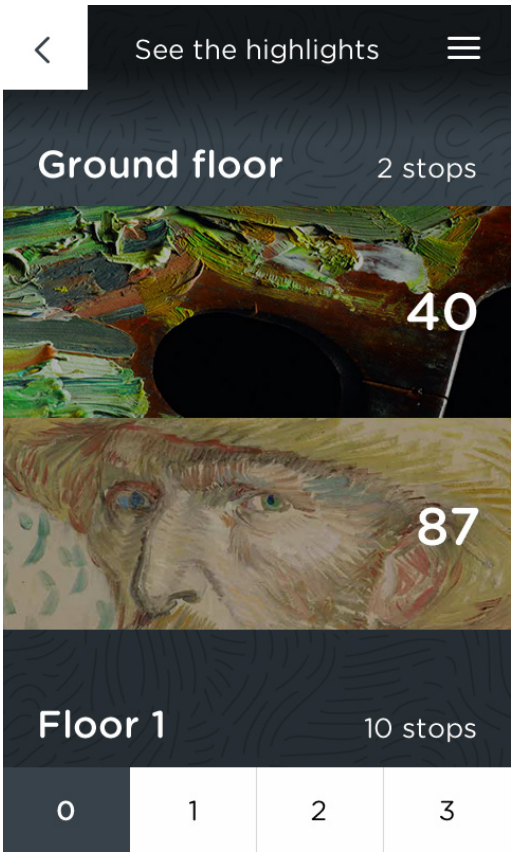


Figure 16. Highlight tour selection screen.

The multimedia guide has been built as an application running on a customized android device. Because the multimedia guide is built as an application it is possible to quickly change content and receive analytics data like the tour choice, sequence of fragments, time spent on each stop and language from each individual device.

Some segments in the multimedia guide already try to improve the visitor flow. At popular works in the collection, like Sunflowers, visitors are asked to “take a step back, because other visitors want to take a look as well”. Another example of improving the visitor flow is that during the exhibition ‘Van Gogh, Rousseau, Corot: In the Forest’, which was displayed from July 7 till September 10 2017, visitors received a message that encourages them to also visit the temporary exhibition after the last stop of the permanent exhibition.

In 2016 a test was performed to see if it is possible to guide people around the exhibition using audio directions in the multimedia guide. For this test, a fragment was added to the introduction of the multimedia guide telling visitors to start their visit on the third floor of the permanent exhibition. 85% of the visitor that received this instruction followed the direction and proceeded directly to the third floor to start the visit there (Van Gogh Museum, 2016d).

At the moment the museum is working on a pilot of a virtual beacon system from Cisco (Cisco, n.d.) in the temporary exhibition ‘Van Gogh & Japan’. This virtual beacon system is similar to a Bluetooth beacon system (Appendix D), but does not require the installation of physical beacons in the space. Instead the system uses triangulation to place beacon points in space, making it a more flexible system. This virtual beacon system will allow multimedia guide devices to position themselves in space and offer content based on this position. This will eliminate the need for multimedia stop numbers next to paintings. Furthermore, this pilot made it possible to upload or download information to or from the multimedia guide devices. This way a real time visitor count per gallery can be achieved when this position data is retrieved from the multimedia tour devices. The regular Wi-Fi infrastructure, which guest can already use to access free Wi-Fi throughout the building, is used to connect each multimedia guide device to the central system. The museum is looking into applying this technique at the permanent collection as well.

The museum visitor

Visitor demographics

In 2016 the Van Gogh Museum received 2,1 million visitors (Van Gogh Museum, 2016a). The museum is particularly popular among tourist visiting Amsterdam. These tourists arrive from all over the world. In 2016, 14% of the total number of visitors had a Dutch nationality. Besides the Netherlands, the museum is popular in countries like the United States, Italy, Great Britain and France (Figure 19). The average age at the Van Gogh Museum in 2016 was 35 years old (Van Gogh Museum, 2016b).

The total number of visitors is not steady throughout the year. The used capacity of the museum is a result of the total number of visitors and the total capacity of the museum. This museum capacity changes based on the opening hours of the museum and the use of the temporary exhibition wing. In 2016 the used capacity fluctuates between 48% and 93% and is visualized in Figure 17.

65% of the visitors visit the museum in a group of two persons (Figure 18) (Van Gogh Museum, 2015a). For 85% of the visitors it is their first time visiting the museum (Van Gogh Museum, 2015a).

During peak moments, the Van Gogh Museum experience peak entry moments of up to 1000 new visitors per hour. (Van Gogh Museum, 2017e). This peak entry capacity is reached during the first opening hour on days where a lot of people want to visit the museum.

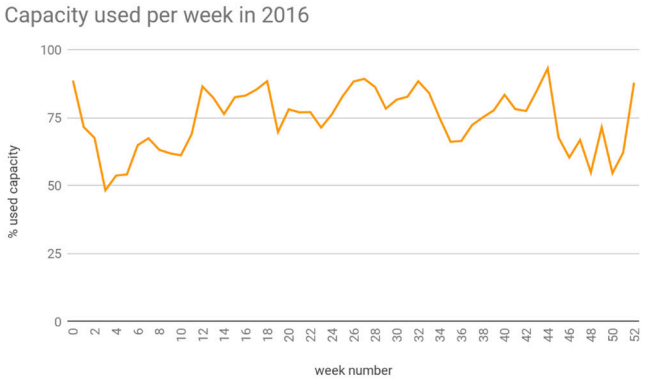


Figure 17. Capacity used per week in 2016

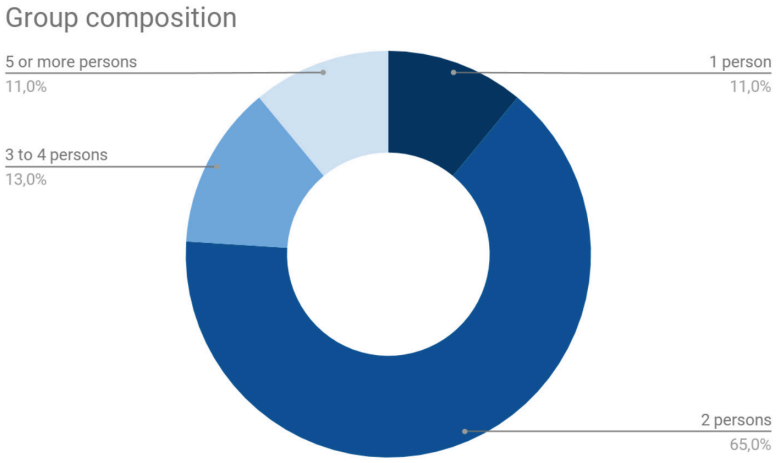


Figure 18. Group composition

Visitor motivation

A museum visit is a unique experience for every visitor and is largely formed by the goals visitors have when visiting a museum. Understanding these goals forms the basis of tailoring visitor experience to the expectations of the visitors. When visitors can realize their goal, the museum visit will be more meaningful and their experience more positive.

The visitor identity categories of Falk (2016) specify seven motivation categories for people to visit a museum:

- **Explorers** are curiosity driven and have a generic interest in the content of the museum. They expect to find new information that grabs their attention.
- **Facilitators** are socially motivated. Their visit is focused on enabling the experience and learning of others in their social group.
- **Professionals/Hobbyists** feel a close connection between the museum content and their professional or hobbyist projects. Their visits are focused on finding specific content-related knowledge.
- **Experience seekers** are motivated to visit because they feel the museum is an important destination but they do not have a specific interest in the museum content.
- **Rechargers** see the museum as a refuge from the 'normal' world or as confirmation of their religious believes.
- **Respectful pilgrims** are individuals who visit museums out of a sense of duty or obligation to honour of those represented by the institution.
- **Affinity seekers** are motivated to visit a museum or specific exhibition because it speaks to their sense of heritage, identity or person hood.

Nationality	% Of total visitors in 2016
The Netherlands	14%
United States	14%
Italy	12%
Great Britain	8%
France	8%
Germany	6%
Spain	4%
China	4%
Brazil	2%
Australia	2%
Russia	2%
South-Korea	2%
Japan	2%
Canada	2%
Belgium	1%
Turkey	1%
Other	17%

Figure 19. Visitor nationalities

Visitor categories

Since the Van Gogh Museum attracts a wide variety of visitors from all over the world it is important to create structure in this large diversity. The museum has created visitor categories (Van Gogh Museum, 2016c) based on the Glocalities model developed by Motivaction (Motivaction, 2014). The categories where elaborated with research on learning styles (Cachet, 2017). The visitor categories are Creatives, Challengers, conservatives and achievers.

Creatives

Creatives are all-round busy people who like art and are museum minded. They visit museums on a regular basis. They want to deepen their understanding of the topic and are searching inspiration through surprising angles. Creatives prefer to receive this information in a professional way such as expert guides, magazines and text.

Challengers

Challengers are impulsive and always looking for thrills, kicks and unique experiences. They are not art minded but think the Van Gogh Museum is an important destination to visit. They want to receive information through popular media like video, audio, games and the internet. Challengers like interactivity and are looking for a surprising and fun experience.

Conservatives

Conservatives like arts and prefer a well-structured and predictable visit. They visit with their family and plan their visit thoroughly to get the most out of their visit. They like to receive content related information before their visit and like traditional media such as newspapers, books, magazines and television.

Achievers

Achievers are formal and career-oriented people. They have high expectations of themselves and their surroundings. They prepare their visit thoroughly.

All visitor categories respect the museum as an institutional expert and want to be guided through the content of the museum.

Figure 20 shows the share of each visitor category in the total number of visitors at the Van Gogh Museum. Since the exact ratio between the visitor categories is unknown, the size of the circles in the illustration represents the share of each visitor category in the museum (Van Gogh Museum, 2016c).

These visitor categories exist next to the identity motivation categories of Falk (described on page 18). To find out how the different motivations are represented within the Van Gogh Museum the existing Glocalities categories were translated onto these motivations. The result is a rough but insightful ratio of motivation categories. Figure 21 shows the relative size of the different motivation categories in the same scale as the visitor categories visualization in Figure 20.

As can be seen in Figure 21, the visitors that arrive at the museum with an experience seeker motivation is the largest group (an estimated 40%), closely followed by rechargers (an estimated 17%). This is not an unexpected result since the museum is located in Amsterdam and therefore attracts large numbers of tourists. This means the group of visitors that want to visit the museum because they think it is an important destination is substantial. The demographic information available at the Van Gogh Museum reflects this in the low average age of the museum visitors.

Figure 20. Visitor categories at the museum

Figure 21. Motivation categories at the museum

Customer journey

A museum visit to the Van Gogh Museum exists of a number of touch points between the museum and the visitor (Figure 22). The visit can roughly be divided into three sections. The preparation of the visit, the visit itself and a follow-up.

Preparation

Before the actual visit to the museum there are several touch points between the visitor and the museum. These touch points differ between the way visitors acquire their ticket. There are three main ways to buy a ticket: online, through a reseller or directly from the museum at the registry.

The ratio between sales channels in 2017 (up until December) was: (Van Gogh Museum, 2017e)

- Online by Van Gogh Museum: 36%
- Direct sales at the Van Gogh Museum: 49%
- Resellers: 15%

Online tickets sold through the website

For visitors that buy their ticket online the first step is to get to know about the existence of the museum. This can be achieved through advertisements using websites, newspapers, billboards, social media, etc. The largest factor in spreading the name of the museum is worth of mouth. People that had a positive museum experience will recommend the museum within their network.

Because online tickets are time specific the next step for visitors is to plan their visit and gather the necessary information. The tool they use for this is the ticket-website of the Van Gogh Museum. For this type of visitor both this step and the step of getting to know the museum takes place outside of the museum premises.

Once they bought their ticket visitors have to get to the museum which requires finding their way through Amsterdam. For navigation both paper maps and digital tools like Google maps are used.

When visitors with an online ticket arrive at the museum they can immediately proceed to the entrance to get their ticket scanned.

Offline ticket sold at the Van Gogh Museum

Visitors that buy their ticket at the museum itself go through a similar preparation process as visitors that buy their ticket online. They first have to know about the existence of the museum and decide if they want to visit. This step can take place at home, the hotel or in front of the museum.

When these visitors have decided to visit the museum they have to get to the museum in the same way as visitors with an online ticket.

Once at the museum the visitors have to buy a ticket at the registry in front of the museum. Because of the limited capacity of the museum, there is a limited number of tickets available per hour. This means that people that buy their tickets at the museum may have to wait in line. On busy days visitors can spend multiple hours waiting in line. Visitors are therefore encouraged to buy their ticket online to avoid waiting outside in front of the museum.

Once these visitors acquire their tickets they can proceed to the entrance of the museum.

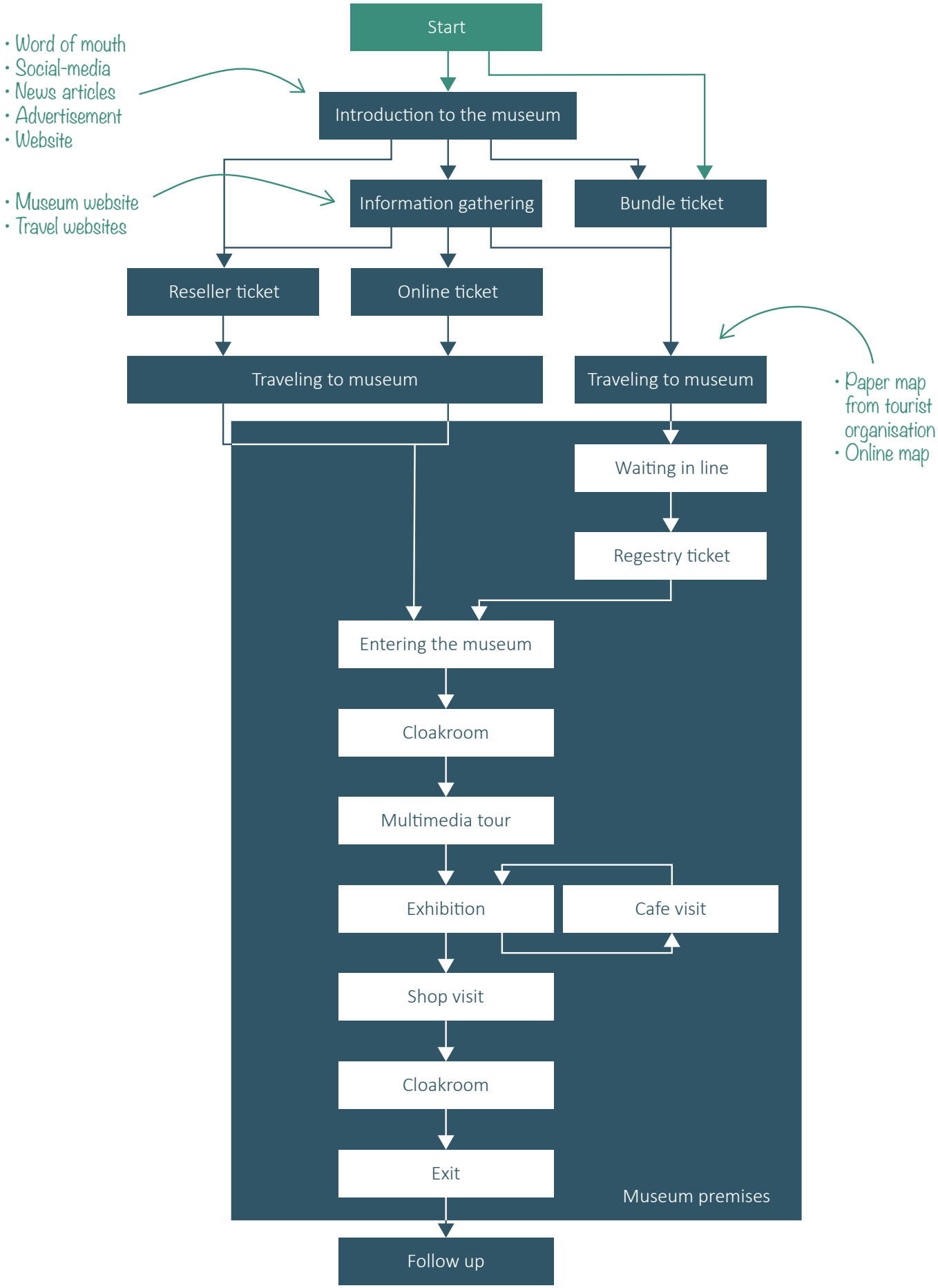


Figure 22. General customer journey of the Van Gogh Museum

Tickets sold by resellers

Both online and offline tickets can be bought at the Van Gogh Museum directly but are also available through resellers. For the visitor, buying a ticket through a reseller results in the same experience as buying a ticket directly from the museum. For the museum however it is harder to reach visitors directly to provide additional information through for instance mail since the museum is not the party that is in contact with the customer.

Tickets to the Van Gogh Museum are also available as part of bundles for tourists in Amsterdam. These bundles include 'I amsterdam', 'City Cards', 'Holland Pass' and 'Museumkaart'. All of these passes give access to multiple museums or attractions in the Netherlands. Some of these bundle cards are similar to a gift card which visitors can redeem for a ticket at the museum registry, meaning the visitor still risks waiting in line, while other bundle cards give access to the museum directly.

During the visit

Once through the entrance all visitors are advised to drop their jacket and bag at the cloakroom. Optionally they pick up a multimedia guide after which they proceed to the exhibition. During the first part of their visit, visitors are presented with a high number of wayfinding tools and screens (Figure 23) which all contain important information.

At one point during their visit they will most likely consume some food or beverages in the restaurant and return to the exhibition or proceed to the exit. Before visitors exit they are likely to walk through the museum shop, then pick up their possessions at the cloakroom and exit the museum. When a temporary exhibition is available visitors will often visit this temporary exhibition after their visit to the permanent exhibition.

Follow-up

After their visit, visitors are confronted with different kinds of media. When visitors bought an online ticket at the Van Gogh Museum they had the choice to subscribe to the newsletters of the museum. This newsletter shares updates on everything that is happening at the museum but can also be customized by the visitor to contain relevant information like science, discounts, events, etc. The newsletter is available in English and Dutch (Van Gogh Museum, 2017c).

Besides the newsletter, the Van Gogh Museum is active on social media like Google, Tripadvisor, Facebook, Instagram and Twitter to keep in touch with its audience. Visitors want to share their experience after their visit. Social media is a good channel for this on which the museum itself can engage to create a dialogue with visitors.

News and articles can also be relevant as follow up information. People that have visited the Van Gogh Museum will be reminded of the existence of the museum and will feel a closer connection to the museum when they come across a news article in for instance a newspaper. The museum therefore has an interest in making sure the name “Van Gogh” appears in the media on a regular basis.

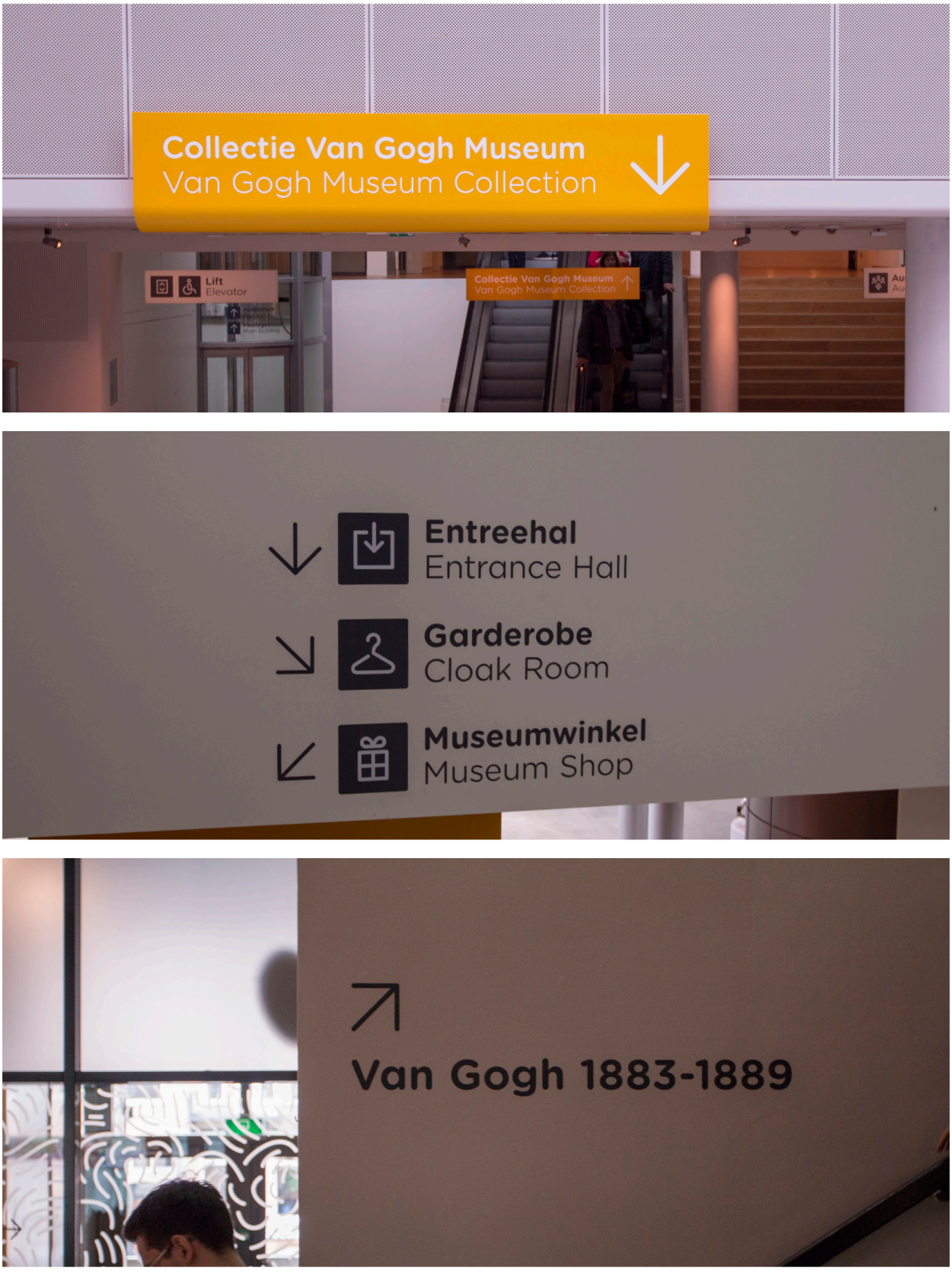


Figure 23. Wayfinding tools in the museum.

Visitor behavior

Phases of the museum visit

Theory describes a general way in which visitors interact with museum environments. This interaction is independent of the content or design of the museum. Falk (2013) describes the museum visit in four phases: orientation, intensive looking, exhibition cruising and leave-taking (Figure 24). The relation between these phases is different for experienced and inexperienced visitors.

During the **orientation** phase, which lasts around three to ten minutes, visitors try to make sense of the people, objects, paths and architecture. Providing a map in the orientation phase can help decrease the visitor's confusion. After their arrival, visitors consult their group or ask for information at the information desk. Visitors also tend to look at other visitors to understand the desired behavior in the museum (Koran, 1988). This phase can have a large impact on visitors' initial actions and overall experience (Hayward, 1984).

During the next phase, **intensive looking**, visitors focus all their attention on the exhibition they encounter. They try to move through the exhibition in a systematic way and do what they think is expected of them: looking at art and reading the labels. During this phase visitors are not led by their personal interest or attractiveness of the exhibition. Over a period of roughly 30 minutes this attention fades to a point where visitors do not read every label and do not look at every object in detail anymore.

This phase is called **cruising** and lasts on average 30 minutes. During this phase, visitors want to see the entire exhibition to make sure they do not miss any interesting objects, but they do not look at every painting in detail. Only when an object sparks their interest will they move towards it to take a better look and read the labels.

After two hours, museum fatigue starts to kick in. Feet are getting sore and attention is low. At this moment visitors start to discuss hunger, rest rooms and the gift shop. Where the previous three phases were only focused on the exhibitions, this phase broadens to other aspects of the museum including architecture, other visitors and facilities. Eventually visitors decide it is time to **leave** or take a break in the restaurant.

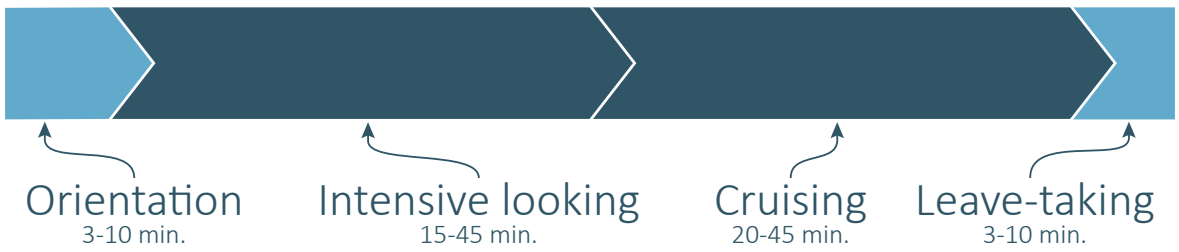


Figure 24. Phases of the museum visit.

Inexperienced visitors

Inexperienced visitors are initially disoriented in the museum space. They need the orientation phase to make themselves familiar with the architecture of the building and the museum etiquettes. Inexperienced visitors go through all four phases described and are characterized by an inefficient way of navigating through the museum. Because they do not know what is interesting, or where to find a certain object, they often want to see every part of the museum. Not because they are interested in all objects but because they do not want to take the risk of missing something.

Experienced visitors

Experienced visitors are characterized by a more efficient way of visiting a museum. Experienced visitors often do not require an orientation phase, since they have experience in navigating exhibitions. They know what they want to see and where to go. The largest part of their visit consists of intensively looking at objects. Overall they spend less time in the museum than inexperienced visitors, because they do not feel the urge to see the entire exhibition, instead they move directly to the part of the exhibition they think is interesting and are more willing to skip parts they do not find interesting. Experienced visitors are equally influenced by physical and mental fatigue as inexperienced visitors.

Pulsing versus free flow

Pacing describes the way and speed in which individuals or groups of people move through spaces (Reed, 2013). Within this description a distinction is made between a pulsing flow and a free flow.

Pulsing happens when a large number of people try to move in the same direction at the same time. Routes to this destination will be very crowded for a short amount of time. For example, when a screening in a cinema ends, all visitors want to leave at the same time creating congestions on even the widest paths.

Free flow, on the other hand, continuously allows people to leave a space, resulting in a spread of people and better use of the capacity of paths.

At the moment, the visitor flow in the Van Gogh Museum is considered to be free flowing.

Roaming time

Based on observations and interviews the time spent during the intensive looking and cruising phases can be further split into two main categories. The first category consists of time visitors spent engaged with the art. The second category consists of time that is not spent engaging with the art. This so-called roaming time is spent orienting to the architecture of the building, waiting in line and planning the next move through the galleries. One way of achieving the goal of an improved visitor flow, is to let visitors spend less time in the galleries. This can be achieved by decreasing the roaming time, which will reduce the total time of a visit, while the time visitors can engage with the art is not negatively influenced (Figure 25).

Efficient and inefficient roaming time

Part of the roaming time is spend in an inefficient way by thinking about or performing practical tasks, like orienting to the architecture of the building, waiting in line and planning the next move through the galleries. A different part of the roaming time can be valuable for visitors. This efficient roaming time can for instance provide a mental break between looking at art. During this break visitors can process the information they just received by giving this information a place in the general story of the exhibition and possibly deepen their understanding, by relating this information to other artworks. Roaming time is also a good moment for social interaction within visiting group.

During the visitors interviews on page 29, a number of visitors mentioned they like to explore the exhibition by themselves by finding their own way and curating their own content. This requires visitors to have moments in which they are not engaged with the art, to determine their next direction. Other moments of this roaming time like finding the next destination, waiting for a crowd, orienting in space or operating the multimedia guide are less efficient and do not complement the experience of watching art.

During the intensive looking phase, roaming time is mostly efficient, since visitors have to process and discuss all information they just received. During the cruising phase however, roaming time is mostly spent inefficiently by planning the next move and scanning the content of the museum for something interesting. Effective roaming time is reduced as visitors have less content to discuss or process.

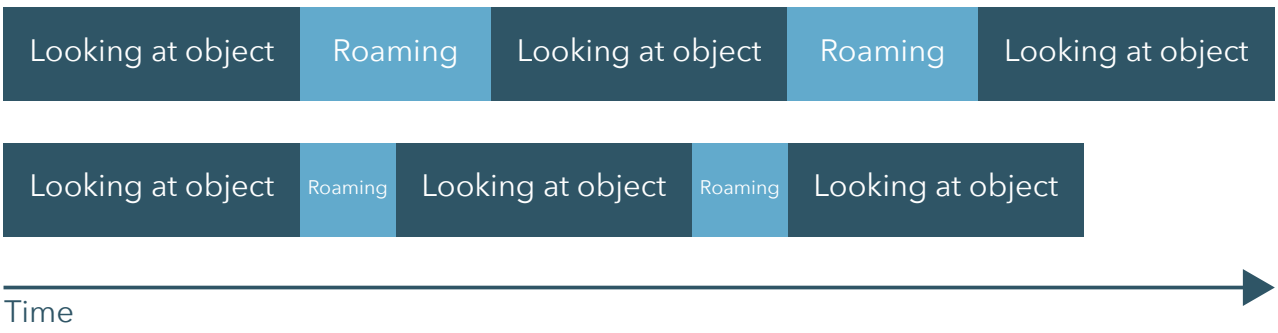


Figure 25. Decreasing roaming time will reduce time visitors spend in galleries.

Practice at the Van Gogh Museum

To evaluate the presence and influence of the theories of this research at the Van Gogh Museum, observations, and interviews were conducted. Furthermore, the data of the track and trace study performed by the Van Gogh Museum was analyzed.

Track and trace study

To get insights in the visitor flow at the Van Gogh Museum a track and trace study was performed by the Van Gogh Museum. (Van Gogh Museum, 2016d) This research resulted in visuals of the path visitors took through the exhibition, as well as their use of the multimedia guide. From this research a list of key findings was made:

- People with a multimedia guide move more towards the middle of the space.
- People without a multimedia guide are following a more specific route along the paintings and have a more structured way of moving.

Observations

Besides this track and trace research the visitor flow in different galleries within the permanent exhibition was observed. Observations were performed at every floor of the permanent exhibition for at least 30 minutes at a time and were performed on both busy and quiet moments. These observations resulted in a list of recurring insights:

General:

- Visitors want to see all paintings within a gallery but they do not look at all paintings intensively. Often a quick glance is enough, visitors will, however, stand in line for that quick glance.
- Visitors move through the galleries in a systematic way to see every painting. They often move along the walls of a space.
- Crowded places in a gallery have an attracting effect on visitors that just entered the gallery.
- People move around in small groups, even when they do not belong together. When someone starts to move the rest will follow.
- Visitors do not directly move to the most popular painting even when this painting is in full view.
- Text takes a long time to read and therefore can creates lines.
- Guided tours mean it is suddenly very crowded in a space and in front of a painting.

Visitors using a multimedia guide:

- Visitors with a multimedia guide move around more independently but move to a next gallery together.
- Visitors with a multimedia guide will listen to the audio in front of a painting, often looking down at their device.
- As soon as the fragment of a multimedia guide ends people will move on.
- Multimedia guide users can not enter a number into the device and keep walking at the same time.
- The urge to read labels at the paintings is big, even when already having a multimedia guide.
- Multimedia guide visitors are more likely to cross the space instead of sticking to the walls.

Visitors not using a multimedia guide:

- Visitors without a multimedia guide move around with their group.
- Non-multimedia guide visitors are more systematic in their path through the gallery.

Visitor interviews

To get to know more about the types of visitors that visit the Van Gogh Museum and their experience a set of six interviews was conducted. These interviews provided insights on the expectation, motivation, preparation and experience of visitors.

The interviews consisted of a part before and a part after the visit. The part before the visit had as goal to sensitize visitors so they would better observe their experience during their visit. This first part consisted of a list of five statements which visitors had to score on a Likert scale. Visitors were asked to complete this short survey and return after their visit for a short five minute interview.

The interview after the visit was based on five questions that were discussed and recorded. The questions focused on preparation of the visit, experience of the exhibition space, visitor motivation, use of the multimedia guide and the way people wanted to be guided through the exhibition.

The interview was performed with six visitors ranging in age, gender and nationality and museum experience. The complete script of the interview including statements and interview questions can be found in Appendix A. The filled in questionnaires and transcribed interviews that resulted from this research can be found in Appendix B. For administration purposes and to match before and after visit data each participant received a tracking number which was only known by the researcher. This explains why the participant numbers in the final results of the research are not consecutive.

Based on their responses during the interview and the answers to the questionnaires participants were placed in visitors and motivation categories.

The interviews resulted in 33 statement cards which were clustered by theme (Figure 26). These themes provided insights in the museum experience of different visitors.

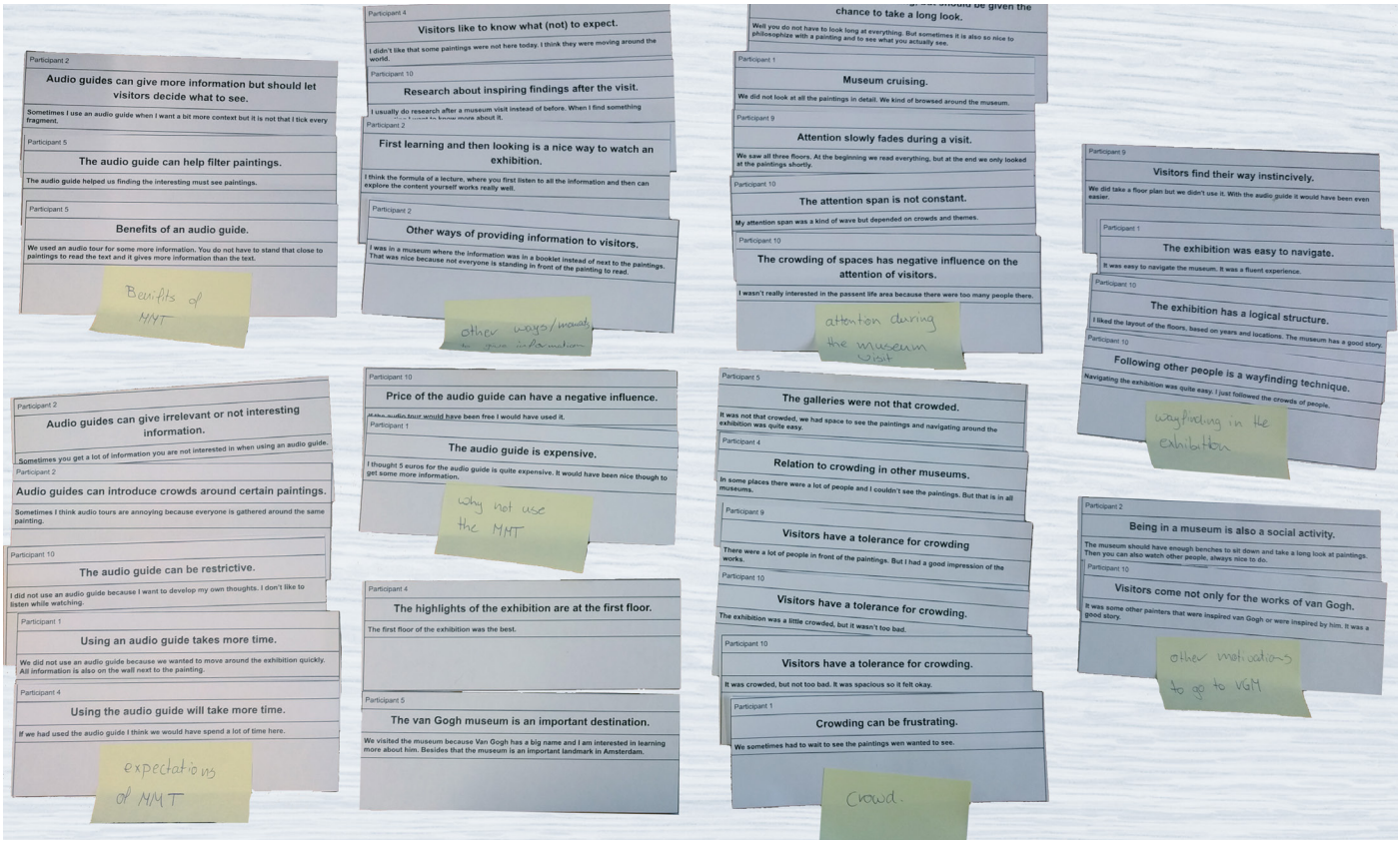


Figure 26. Clustering statement cards that resulted from the interviews

Participant descriptions

Participant 1

A man of around 30 years old from Argentina visited the museum with his mother. They were in the museum for 2 hours.

Based on his response with regard to museum knowledge and Van Gogh context he fits within the **Creative** visitor category and had a **Explorer** motivation. He is an **experienced** museum visitor.

Participant 2

Dutch lady of around 60 years old who was visiting with a friend. They were at the museum for a lecture from the Vrije Academie about the exhibition Dutch in Paris. She visited the museum for 3,5 hours.

This lady fitted in the **Conservative** visitor category with a **Recharger** motivation. She was an **experienced** museum visitor, visiting around 4 museums a month, with a lot of ideas about what a museum should be.

Participant 3

Two Mexican women of around 45 years old that were in Amsterdam for a training and decided to visit the museum in their free time. They bought their tickets through Tours&Tickets and visited for 2,5 hours.

They were interested in art but did not have any special knowledge about Van Gogh. They fit within the **Creative** visitor category with a **Recharger** motive and were **inexperienced** museum visitors.

Participant 4

An American family with parents of around 40 years old and one child of around 14 years old who bought their tickets online and visited for 2 hours. They were not particularly interested in art or Van Gogh but mentioned that their visit was very inspiring.

This family fitted in the **Achiever** visitor category and had an **Experience seeker** motivation. They were **inexperienced** museum visitors.

Participant 5

A French couple, both around 25 years old, who were visiting Amsterdam. They were not particularly interested in Van Gogh but felt like it was a good visit. They bought their tickets at the museum and visited for little over 2 hours.

They were not particularly interested in art and had no prior knowledge about Van Gogh. They fitted in the **Challenger** visitor category with an **Experience seeker** motive. They were **inexperienced** museum visitors.

Participant 6

Three friends, all around 25 years old, from the USA and Germany who visited Amsterdam for a couple of days. They entered with online tickets and visited the museum for a total of 1,5 hours.

They were not particularly interested in art or had a lot of knowledge about Van Gogh. They fitted in the **Challenger** visitor category with an **Experience seeker** motive. They were **inexperienced** museum visitors.

Expectations of the multimedia guide.

Several visitors mentioned that they think a multimedia guide will cause their visit to be longer. It was also mentioned that multimedia guides can give irrelevant or uninteresting information and that multimedia guides will introduce crowds around paintings.

Multimedia guides can help filter the important paintings and better see the overall story of the exhibition. Multimedia guides can also provide extra context to paintings but should let visitors decide what to see and do.

The price of the multimedia guide was mentioned several times as a reason not to use it. Several visitors mentioned they would like to use the multimedia guide but the price is holding them back.

Participant 1: "We did not use a multimedia guide because we wanted to move around the exhibition quickly. All information is also on the wall next to the painting."

Participant 2: "Sometimes I think audio tours are annoying because everyone is gathered around the same painting."

Participant 2: "Sometimes I use an audio guide when I want a bit more context but it is not that I tick every fragment."

Participant 4: "The multimedia guide helped us find the interesting must see paintings."

Crowding

Almost all visitors described the crowds in the galleries as "present but not problematic" although at some points they had to wait to see a certain painting. It was mentioned that the crowds in the Van Gogh Museum are not that different from crowds in other museums. Following this statement it should be mentioned that the interviews were conducted during a quiet period in the museum, on the day of the interviews 4252 visitors entered the museum (67,4% of the total visitor capacity was used that day). (Van Gogh Museum, 2017d)

Participant 3: "In some places there were a lot of people and I couldn't see the paintings. But that is in all museums."

Participant 5: "There were a lot of people in front of the paintings. But I had a good impression of the works."

Participant 6: “Navigating the exhibition was quite easy. I just follow the crowds of people.”

Participant 1: “It was easy to navigate the museum. It was a fluent experience.”

Participant 6: “I liked the layout of the floors, based on years and locations. The museum has a good story.”

Wayfinding in the exhibition

Visitors found the exhibition easy to navigate and followed the routes instinctively. They found the order of the exhibition logical and instinctively followed the right routes. One visitor mentioned that she just followed the flow of visitors through the museum. Several visitors mentioned the interesting and logical story of the exhibition.

Participant 6: “I usually do research after a museum visit instead of before. When I find something interesting I want to know more about it.”

Participant 3: “I didn’t like that some paintings were not here today. I think they are moving around the world.”

Preparation

Apart from buying a ticket online almost none of the interviewed visitors prepared their visit before arriving to the museum. Even visitors that bought their ticket online only did so right before their visit, often at their hotel in Amsterdam. No visitor did research on the content of the museum before arrival, one visitor mentioned she likes to do research after her visit on the interesting insights she gained during her visit.

Participant 5: “We saw all three floors. At the beginning we read everything, but at the end we only looked at the paintings shortly.”

Participant 6: “I wasn’t really interested in the peasant life area because there were too many people there.”

Attention during the museum visit

Visitors mentioned museum fatigue and described their attention comes in waves. When they see something interesting they can be very focused but at other times visitors just ‘browse the galleries’ searching for something that sparks their attention. Visitors do not want to see all paintings in detail but want to have the chance to do so. When they see something interesting they want to have the chance to take a long look. This behavior corresponds to museum cruising which is discussed on page 25.

Visitors also mentioned that their attention depends on the crowding of the galleries. When a gallery is crowded visitors lose their attention more quickly because they do not want to stand in line.

Conclusion

The track and trace study together with the observations and interviews confirmed that the visitor phases as described on page 25 are present at the Van Gogh Museum. The research provides insights into the location and duration of these visitor phases within the Van Gogh Museum (Figure 27).

When taking a look at the data it can be concluded that the turning point between the intensive looking and cruising phases lies roughly between gallery 4 and gallery 6 (Figure 28 to Figure 31). The exact location of this turning point will be different for every visitor.

Figure 27. Visiting phases at the Van Gogh Museum, numbers correspond with numbers in figure 28 till 31.

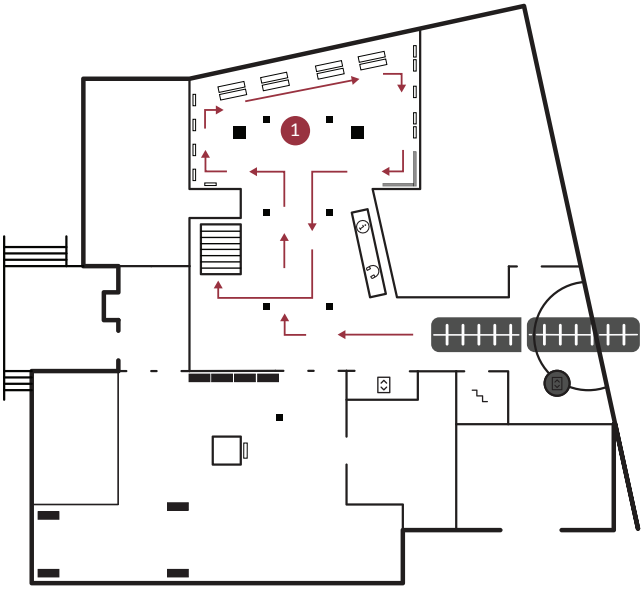


Figure 28. Ground floor - permanent exhibition

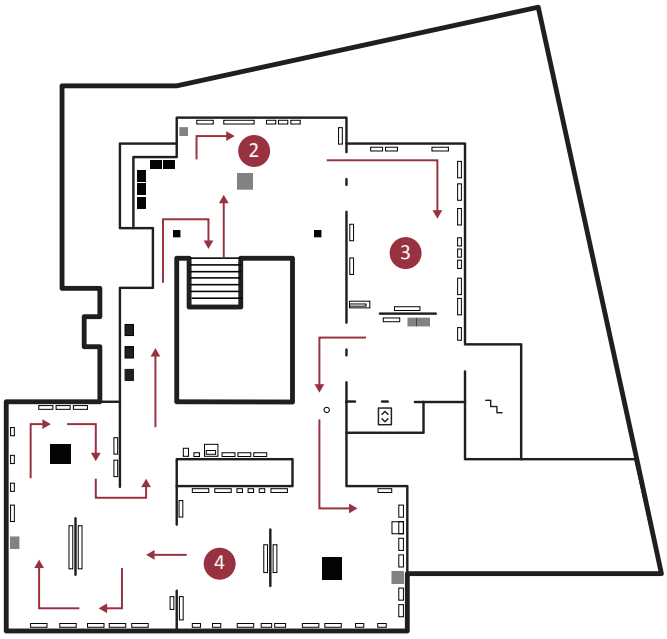


Figure 29. First floor - permanent exhibition

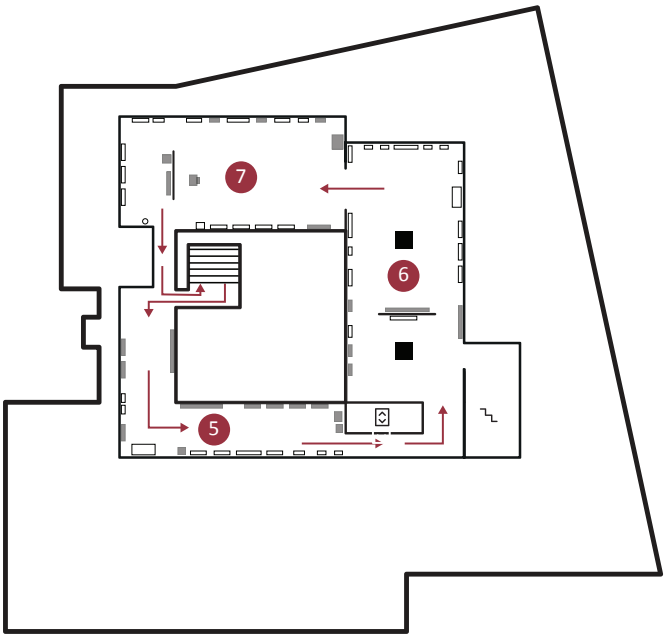


Figure 30. Second floor - permanent exhibition

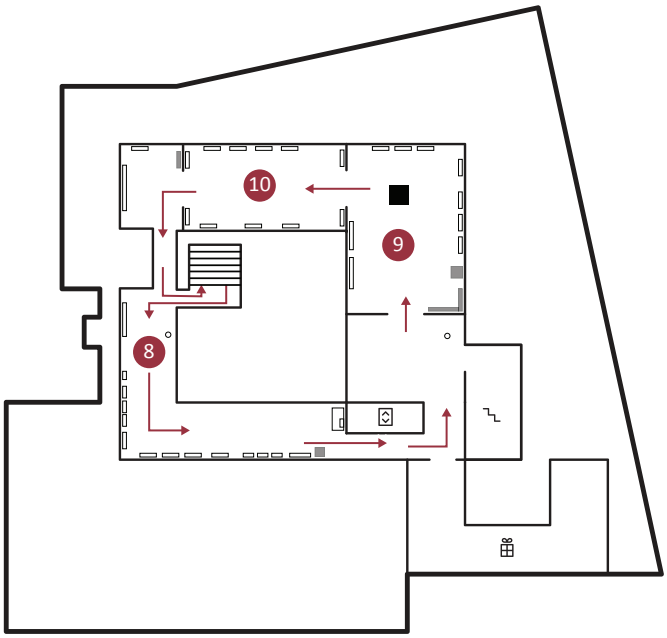


Figure 31. Third floor - permanent exhibition

Research conclusion

From the research it can be concluded that the largest group of visitors to the Van Gogh Museum are tourists. This is reflected by demographic data and the size of the visitor categories and motivation categories. Knowing that this is the largest group there are several characteristics that can be used as starting point for the design phase.

For most of the visitors their visit to the Van Gogh Museum is their first. They are not that well prepared since they often buy their ticket via a reseller or at the museum registry. The main reason for their visit is the name and fame of Van Gogh and the museum.

Literature on visitor behavior learned that one of the ways to make people move more efficiently through the museum would be to reduce the ineffective roaming time in the museum. Reducing this time will keep the effective roaming time of visitors intact while decreasing the time visitors spend in a gallery and keeping the experience of visitors positive.

This ineffective roaming time mainly takes place in the cruising phase of a museum visit. For the Van Gogh Museum the shift from the intensive looking phase to the cruising phase takes place in the "Schatkamer" on the first floor of the exhibition (point 4 in Figure 29).

Search areas

Resulting from the research phase are two search areas for the ideation phase. These areas are:

1 Making roaming time (mainly in the cruising phase) more effective to reduce the total roaming time.

This search area is relevant for improving the efficiency of the museum. Reducing the time visitors spend ineffectively looking around will reduce the total time visitors spend in galleries. Because reducing this ineffective roaming time does not affect the time visitors can spend on looking and processing art, the experience of the visitors will most likely not be influenced negatively.

2 Creating mixed galleries of visitors that are looking and cruising instead of all visitors looking in the first galleries.

Creating mixed galleries will spread all visitor phases around the exhibition. Currently, during busy moments, most visitors start by standing in line at the first exhibition while they walk around more freely during the later galleries. This will reduce the queuing at the beginning of the exhibition by spreading this queuing around the entire exhibition.

Because visitor phases have a fixed sequence within a museum visit, spreading the visitor phases around the exhibition can only be achieved by allowing and stimulating visitors to start the exhibition in different galleries.

Decision for design

Getting back to the goal of this project: ***"to improve the visitor experience by improving the visitor flow"***. It becomes clear that although search area 1 will improve the visitor flow through the museum it will only do so in the galleries where visitors are in their cruising phase since that is the place the most ineffective roaming takes place. Although it will not negatively influence the museum experience, search area 1 will most likely not contribute to an improved visitor experience either.

On the other hand, search area 2 will most likely increase the visitor flow, and will give visitors control over their visit which will improve the visitor experience.

Next to this the possibility exists that by having two phases in one gallery, the phases will inform each other. Meaning that visitors that are cruising will know better where to go because of the visitors that are intensively looking and the visitors that are in the intensive looking phase will move faster through the gallery and will more quickly discover that it is not necessary or expected of them to look at every work in detail.

Because of these reasons the project will elaborate on the idea of creating mixed galleries of both the cruising and intensive looking phases.

Design brief

In the current scenario at the museum almost all visitors start their exhibition visit in the same place (Figure 32). Meaning they enter the intensive looking phase at the same time in the same place and all end with the cruising phase in the same place. This creates a noticeable queue at the beginning of the exhibition because all visitors want to see all works and results in less visitors reaching the end of the exhibition.

Combining the visitor phases around the museum will result in a mix of visitors that are both intensive looking and cruising. This will increase the average speed of the visitor flow in the first galleries, since not all visitors feel the urge to look at every object in detail. And will slow the average flow near the end of the exhibition, since not all visitors are in their cruising phase. This will result in a more balanced visitor pressure in the museum (Figure 33).

Since the visitor flow described by Falk (2013) is a general model which is present in all museums and in which the order and duration of the visiting phases cannot be changed. The solution for achieving mixed galleries lies in enabling and stimulating visitors to start the exhibition in different places.

Entering the exhibition at different places could be achieved by allowing visitors to move between exhibition spaces at random. However, this would mean that the exhibition story should be based on themes that can be told in any order. Because the permanent exhibition of the Van Gogh Museum is based around a chronological story, having visitors enter the exhibition at random places will not be possible without substantial changes to the current storyline of the exhibition. Furthermore, during the renovation of the museum building a temporary exhibition of the Van Gogh Museum at the Hermitage in Amsterdam used a structure based on themes. The experience of the museum during this period was that a theme driven exhibition did not benefit the visitors (Expert brainstorm, 2017).

Because the switch between the intensive looking and cruising phases lies roughly in the middle of the storyline of the exhibition (page 33), telling the story as a reverse chronological story will provide the necessary combination of visiting phases. Because of the chronological story through the exhibition, a reverse chronological story would be possible. In such a story visitors would search back to the origin of Vincent Van Gogh. During conversations with museum experts at the Van Gogh Museum (Expert brainstorm, 2017) it became clear that it would be possible to write a reverse chronological storyline that would be of the same quality as the existing chronological storyline.

Allowing visitors to move in opposite directions within galleries will be problematic for the visitor flow. Changing the order of the story will therefore only have effect on the order in which visitors visit different galleries, not the order in which they move through the individual galleries. This ensures that the galleries will retain their "one way traffic" character.

This design brief consists of two major parts (Figure 34). First, it can be questioned if it is possible to tell the story of the exhibition in reverse-chronological order and how this would influence the visitor experience. The second part of the design brief focuses on stimulating visitors to choose between the two new options (a chronological or reverse chronological visit).

Because of the scope of the master Design for Interaction, the knowledge of the student on the topic of Van Gogh, the schedule of the graduation project and the proof found in literature the decision was made to focus this graduation project on the second part of stimulating choice rather than the development and testing of a reverse chronological storyline.

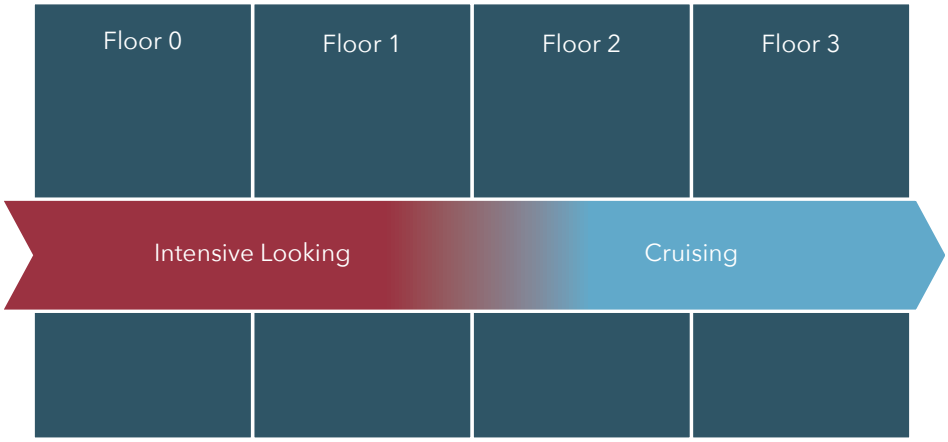


Figure 32. Current visiting scenario.

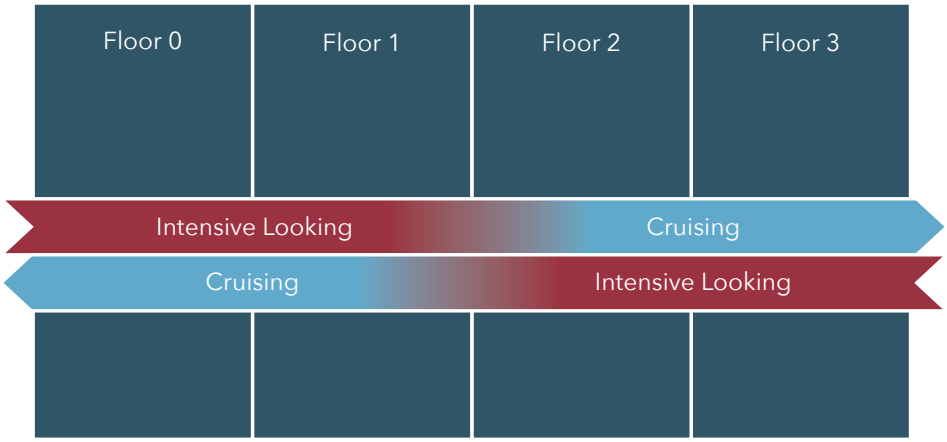


Figure 33. New visiting scenario.

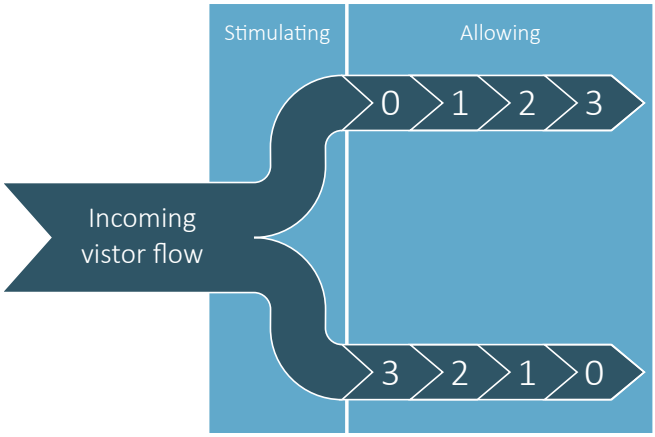


Figure 34. Two aspects of the design brief.

Additional research

After formulating the design brief, several questions on how to approach visitors arose. Answering these questions and seeing the response of visitors when presented with a choice resulted in a set of requirements which will allow for a focused ideation phase.

The main research questions which need to be answered are:

- To what extent do visitors need to get a recommendation of the best choice?
- Do visitors feel comfortable making a choice between the different tours (chronological or reverse chronological)?

The goal of the test is to gain insights on the willingness of visitors to follow directions and how visitors make a choice. Using short interviews with visitors who interacted with the prototype information will be gathered regarding the feeling of independence and free choice.

To answer these questions a test was conducted in which visitors were presented with two tour options. These options were displayed on a prototype which consisted of a tablet that was placed on a stand near the entrance to the Rietveld building (Figure 6). On this tablet several scenarios were displayed, presenting the same choice to visitors in different ways (Figure 37).

Floorplan

In the floorplan in Figure 35 the desired situation is shown. The visitor flow which is coming from the entrance hall has to be split in a group that will proceed to the regular start of the exhibition on the ground floor and a group that will move towards the third floor by using the lift.

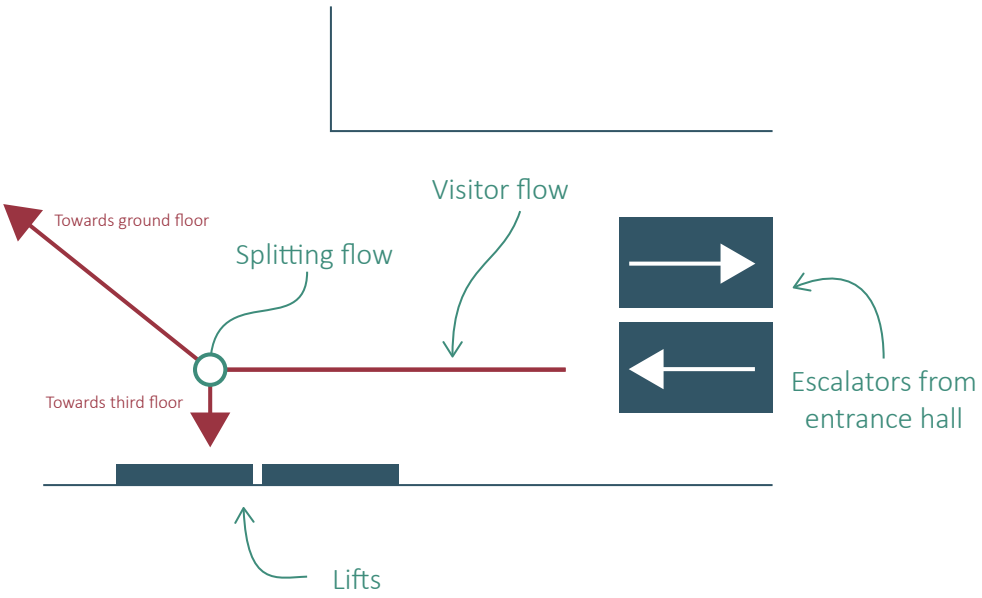


Figure 35. Floorplan of the testing location.

Prototype

One of the scenarios, which are described on page 41, is to let visitors decide which tour to take based on live visitor statistics. Therefore it is important to suggest the element of live data in the prototype. The prototype therefore consists of a tablet which shows an application prototype (Figure 36). This tablet is placed on a mobile stand at the entrance of the permanent exhibition.

Names of the tours

To present the different options a short ideation on possible names for the two tours was performed. Important in this decision is to create two names that are general enough to be chosen by all visitors. The names should not imply a specific theme in the collection because that would suggest that the content of the tours is different and visitors would therefore not see the same objects in both tours.

A short ideation (Appendix F) in combination with the described criteria resulted in ***"Following the life of Van Gogh"*** as the name for the chronological storyline and ***"Discover the origin of Van Gogh"*** for the reverse chronological storyline.

Figure 36. Prototype used for testing.

Tested scenarios

During the test a number of different scenarios was tested (Figure 37).

1. **Free choice**. The iPad application displayed the two tour options which where presented in an identical way. Visitors could select one of these options after which the application displayed the directions of the tour.
2. **Choice based on raw data**. The iPad application displayed the two options with the addition of information about the number of visitors that choose a specific option. Visitors could select an option after which the application displayed the directions to the start of the tour.
3. **Recommended option**. The iPad application showed the two tour options one of which had a different color to make the other option more prominent.
4. **No choice**. The iPad application directly showed one of the tours, including the directions, without allowing visitors to make a choice between the tours.

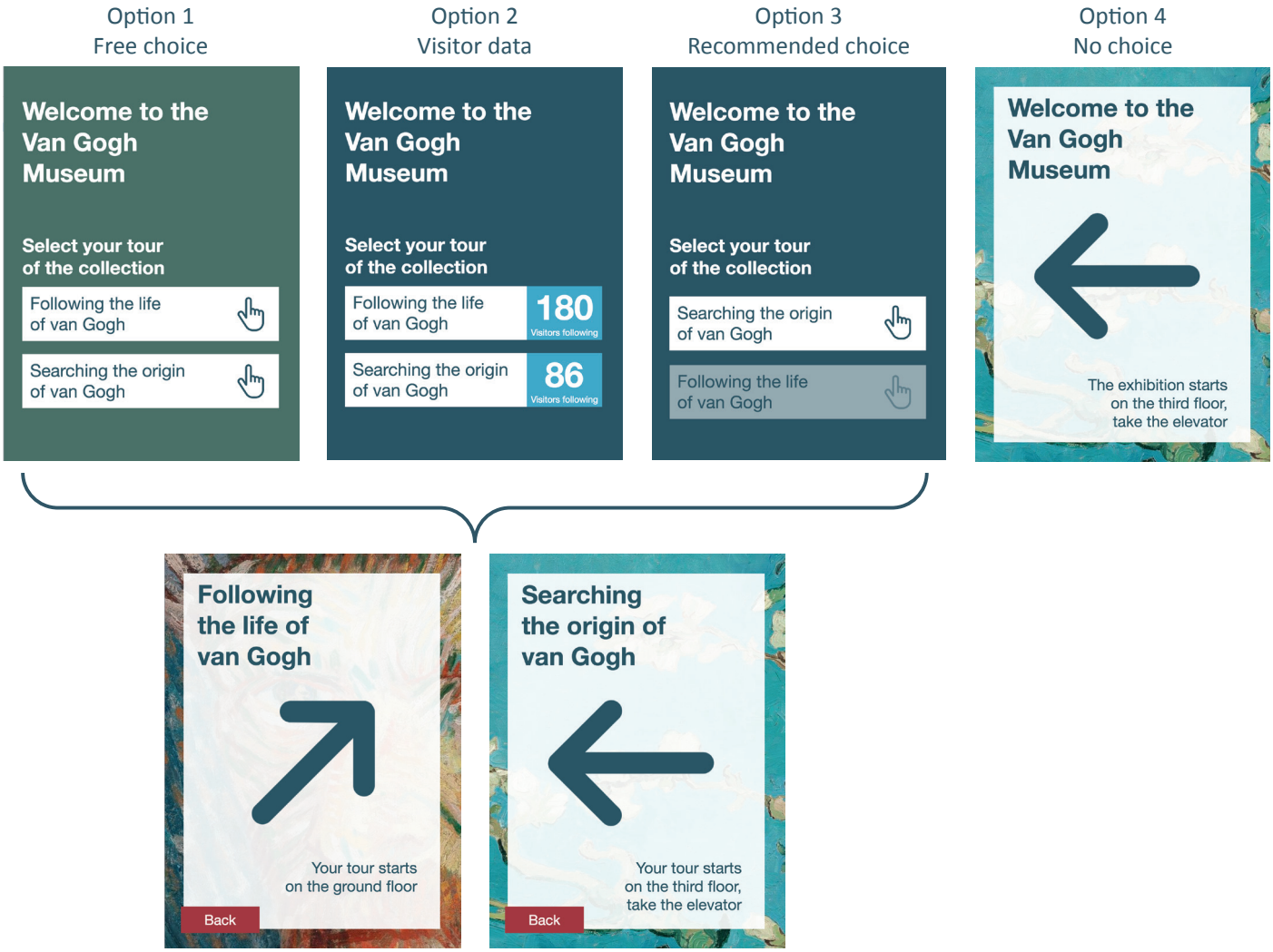


Figure 37. Flowchart of the prototype.

Figure 38. Visitors interacting with the prototype.

Conducting the test

Testing took place on Tuesday 16-1-2018 from 13.30 until 16.30. The used capacity of the museum on this day was 45,8% (Van Gogh Museum, 2018) which is relatively low (page 17). During the test all four scenarios were introduced in turn to the context and visitors were observed. Eight visitors who interacted with the prototype were questioned in a short conversational interview. Figure 38 shows a collection of photos taken during the testing.

Conclusion

The results of this test can be found in Appendix E. This test provided insights in how visitors respond to a choice right at the beginning of their museum visit. Although the form of the prototype was not ideal, the test showed that visitors do follow directions when they are given to them. When visitors have to make their own choice they tend to want to see all options before making a decision. Visitors will often follow the resulting directions after making their choice.

Visitors are more confident when a recommendation is given to them but are not able to translate raw visitor numbers as provided in test scenario 2 into a decision.

The test showed that visitors are willing to make a conscious decision but also want to know what they are choosing. Choosing between two options that are to similar is difficult.

The test also gave some information about the place and form of a possible design. There should be a sufficient amount of time between visitors entering the Rietveld building and presenting visitors with a choice (Figure 39). The prototype showed that a screen and arrow combination will most likely not work.

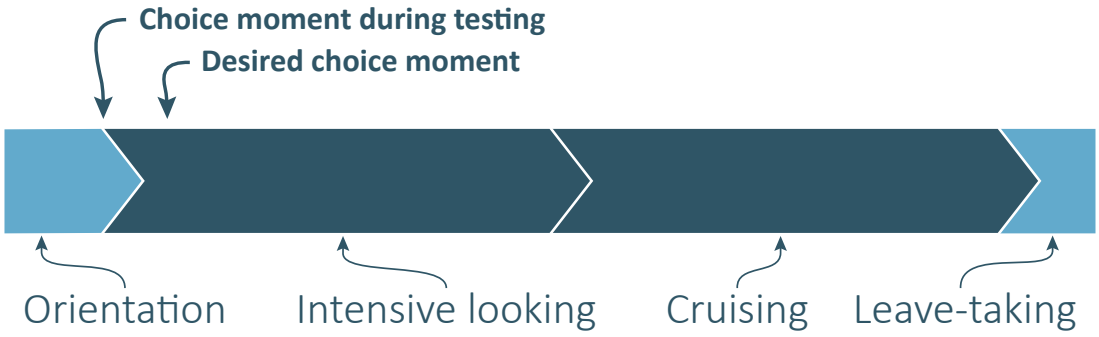


Figure 39. Choice moment within the visitor phases.

Conditions for the design

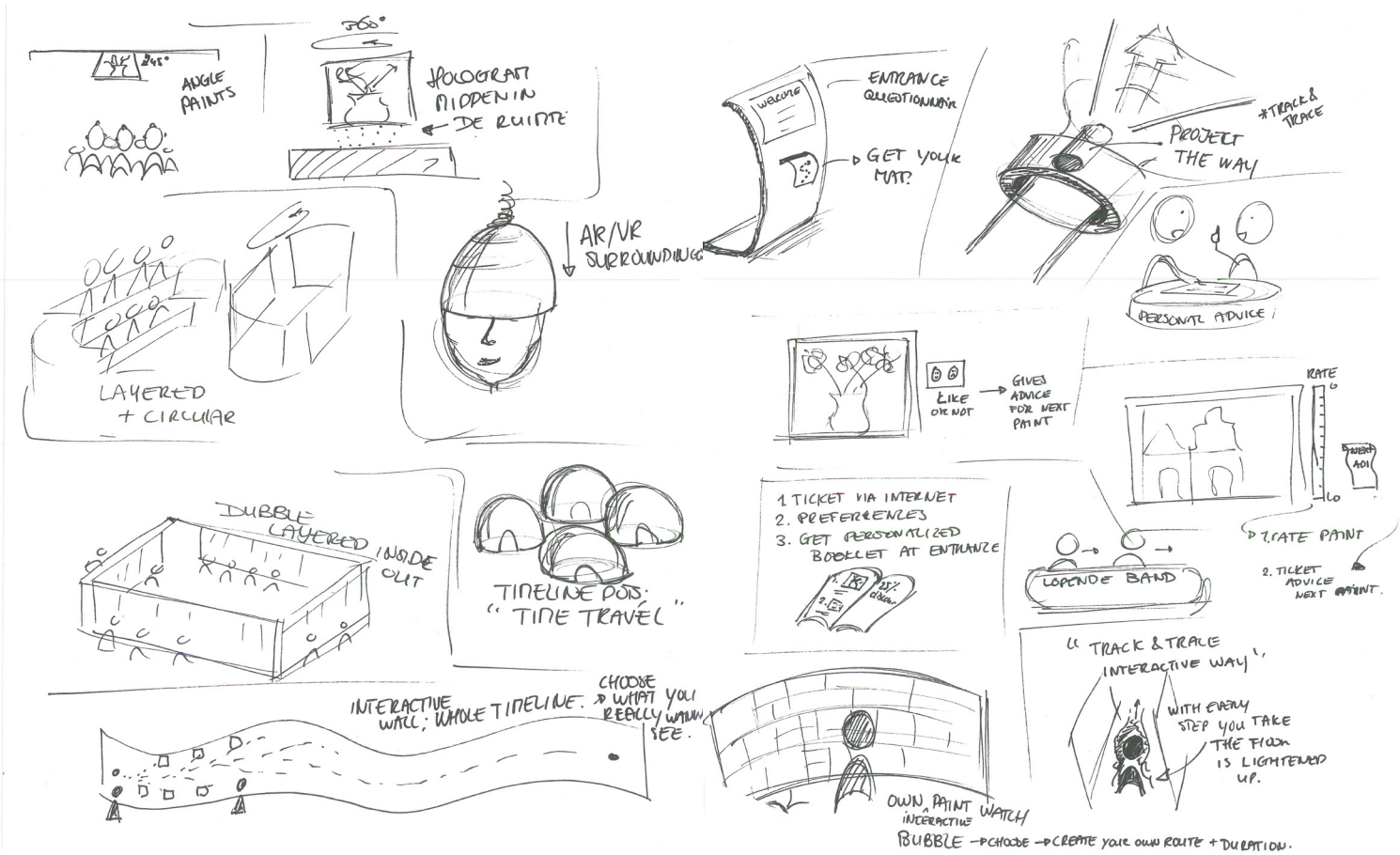
From the tests it can be concluded that visitors are willing to follow directions that are provided to them. Just providing visitors with directions however, can be problematic for two reasons. First, placing yet another wayfinding object in the museum will not work, because visitors are already saturated with wayfinding tools. Secondly, although providing visitors with simple directions will improve the visitor flow through the museum it will not improve the visitor experience.

Based on the information gathered during the test the design brief is elaborated and a set of conditions is created. This set of conditions forms the boundary in which ideation can take place.

1. The design should be capable of splitting a visitor flow of 1000 visitors per hour (page 17).
2. The design should not create pulsing in the visitor flow (page 26).
3. Visitors should be able to use the design with their group. The design should therefore be suitable for groups ranging in size from 1 to 4 visitors (page 17).
4. The design should be part of the beginning of the exhibition, supplying visitors with relevant information about the content of the exhibition (page 43).
5. The design should support visitors in reaching their visiting goals (page 18).
6. The design should not force visitors to make a choice but rather invite them to create their own independent museum visiting experience. A proper museum visit should still be possible without using the design.
7. The design should provide the museum with the ability to split the visitor flow in a chronological and reverse chronological flow (page 37).

Ideation

Using these conditions, the tests and the research an ideation was performed. During this ideation the design problem was split into several smaller problems on which was ideated individually. These sub-problems included position, form and operation. Figure 40 provides an impression of the ideas generated. The final design is a combination of these sub-solutions.



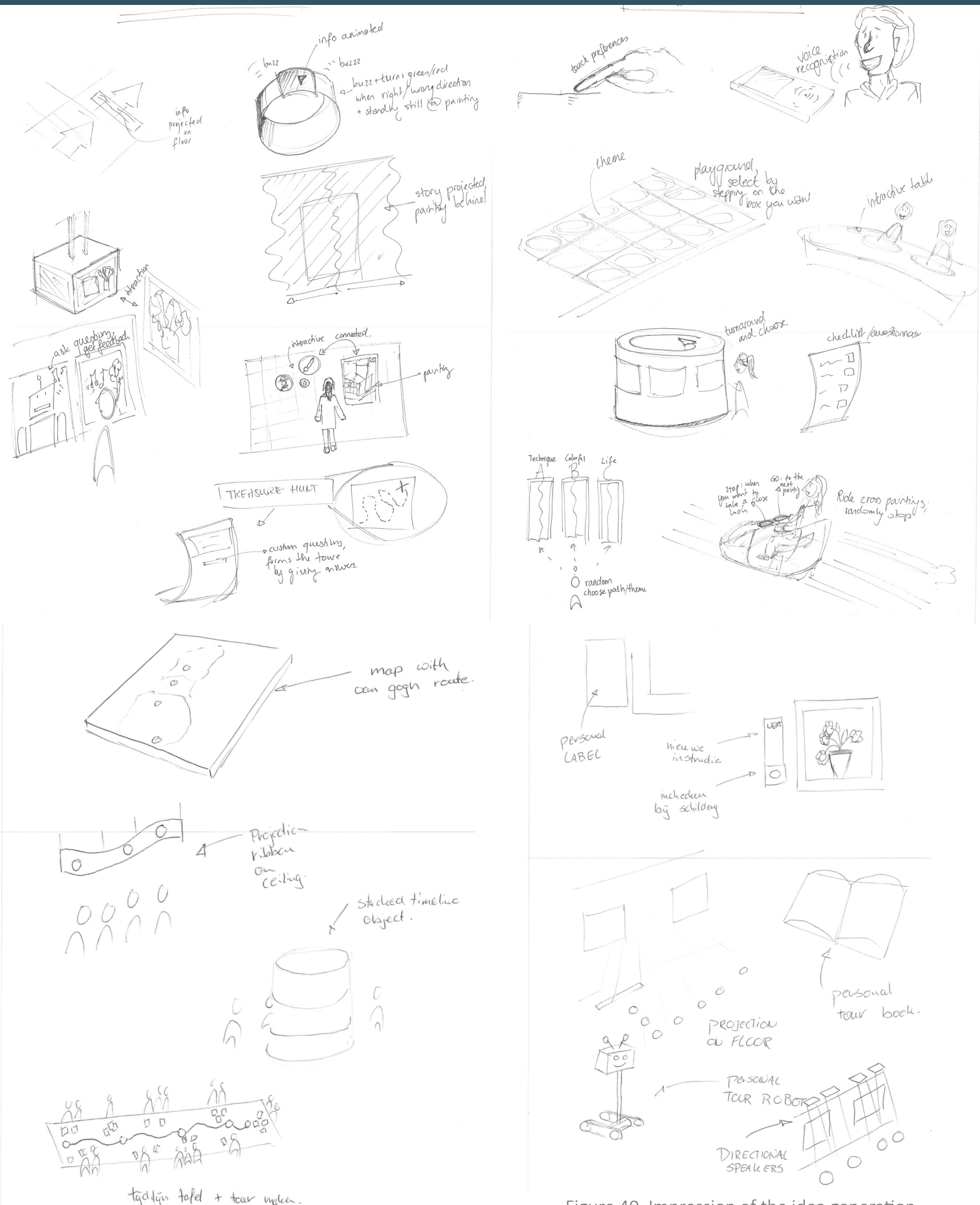


Figure 40. Impression of the idea generation.

Final design

The design consists of a large interactive table which will work together with the existing multimedia guide system to allow visitors to create a personal museum visit (Figure 42).

The design will allow visitors to create their own personal museum visit. Visitors will have the chance to add topics to a basic multimedia guide story. This multimedia guide story will be a continuous story, meaning that the guide will have a predetermined order and visitors are provided with directions to follow this order. The topics selected by visitors will return throughout the continuous storyline, elaborating the basic information of the exhibition at specific paintings. This way the content of the exhibition is more tailored to the goals of the visitor.

These topics are however, not separate but are joined by a so called story framework. The topics are an elaboration of this basic story.

Allowing visitors to compose their own visit will provide the museum with the opportunity to give meaningful directions to visitors. Although visitors are in control about what information they want to receive, the museum will be in control about when, where and how this content is shared. The directions to visitors should be focused on maximizing the available capacity of the museum.

In the first place the museum can decide which visitors to present with a chronological story and which visitors to present with a reverse chronological story (Figure 33). Visitors will accept the route they are presented with as their own personal tour.

In addition, the museum can create topic related content which is available at more than one painting. This way the museum can explain one topic at several paintings. Meaning that for one visitor the topic is explained at painting A while for the other visitor the same topic is explained at painting B. This principle is illustrated in Figure 41.

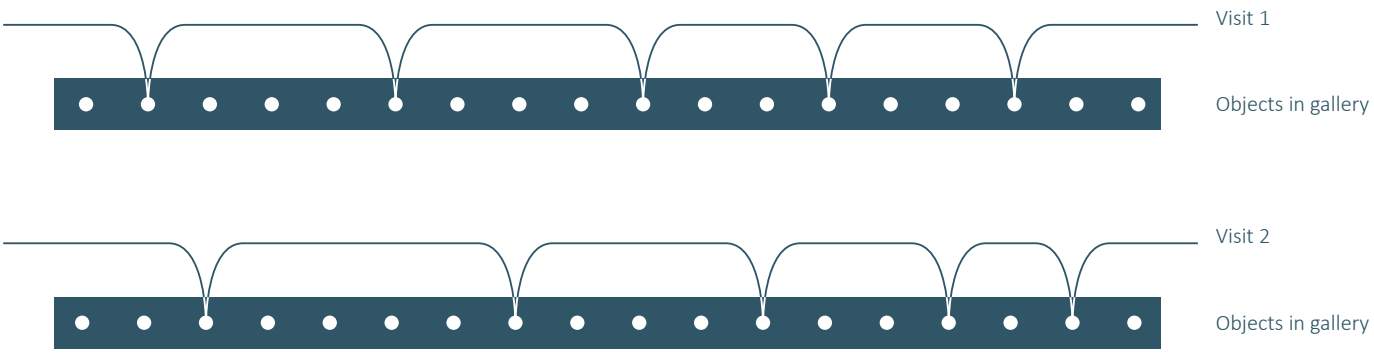


Figure 41. Both visitors receive the same information, only at different paintings. Maximizing all available space in the gallery.

Figure 42. Visualization of the final design.

Combining visitor phases

The goal of the design is to create a balanced mix of visitors that are following the chronological and reverse chronological storyline. The precise ratio between these two flows is a result of a number of variables like the capacity of the third floor in relation to the ground floor, the speed in which visitors with multimedia guide move through the exhibition and the willingness of visitors to accept the directions provided to them.

The design is an elaboration on the existing multimedia guide infrastructure and can therefore only be used by visitors that decide to use a multimedia guide during their visit. Currently, around 26% (Van Gogh Museum, 2017b) of all visitors is using a multimedia guide. With this extra, physically present, incentive of personalizing the tour it is expected that even more visitors will be using a multimedia tour.

Personalization system

From a visitor perspective, the design seems straightforward. Visitors have the chance to 'shop for additional content' and are presented with an exposition tour that is tailored to their interests. The system behind creating this personalized tour however, is more complicated.

The topics visitors select will be inserted into a basic storyline which can be chronological or reverse chronological based on the needs of the museum (Figure 43). This basic storyline will serve as a framework for the exhibition as a whole, similar to the content of the current introduction text at each gallery, the selected topics will go more in-depth on certain topics within the gallery.

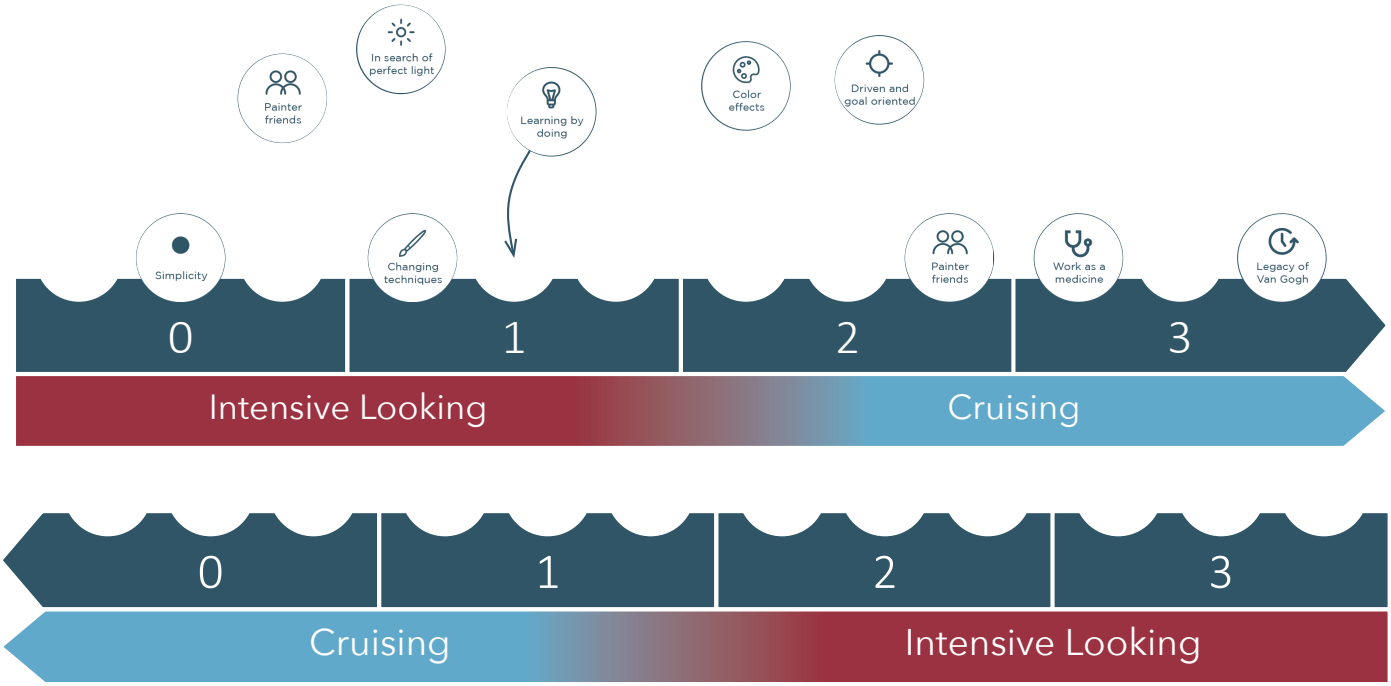
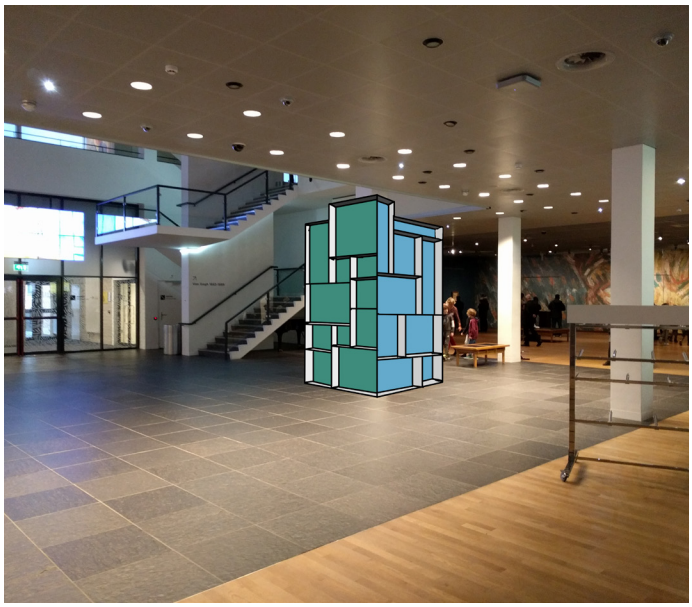


Figure 43. Selected topics are an addition to the chronological or reverse chronological storyline.

Each individual visit needs to be compiled from a different combination of topics, providing each visitor with a unique visit. The system can decide which story framework to choose and what content modules to unlock. This decision is based on the input from visitors and information on the utilization of the different galleries available through sensors.

In a perfect scenario this system of content modules is extremely flexible so that the system is able to present visitors with the correct content, while also spreading visitors around the museum. The system should be able to change the content of the multimedia guide live during a visit, controlling the speed in which visitors move through the exhibition by adding or removing content from the multimedia guide.



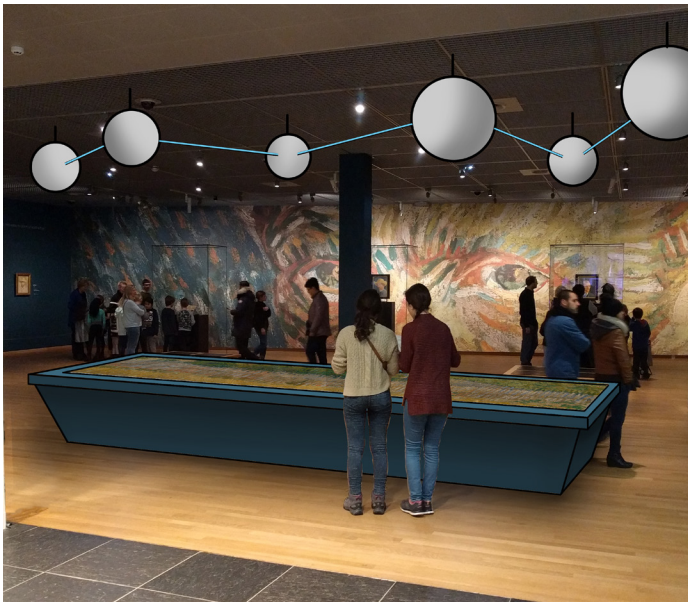


Figure 44. Ideation on the embodiment of the design.

Embodiment

One of the requirements which resulted from the research and testing was that the design should be placed at the beginning of the exhibition, but should also be part of the exhibition. Furthermore, the design should be capable of handling up to 1000 visitors per hour. This means the design should allow multiple visitors to personalize their multimedia guide at the same time. From the numbers of multimedia guide usage and group composition it can be concluded that the design should be able to allow eight visitors simultaneously. This would mean that during rare peak moments the interaction with the interface can take up to 4 minutes.

The final design would therefore be placed in the atrium of the ground floor of the Rietveld building (Figure 42). This is the moment visitors start to engage with the content of the exhibition. In Figure 44 an ideation on the form and place of the design can be found. For the final design it was decided to use a horizontal screen because this keeps the space of the exhibition more open while allowing a large number of visitors to use the design at the same time. The technical feasibility of the design is discussed in Appendix G.

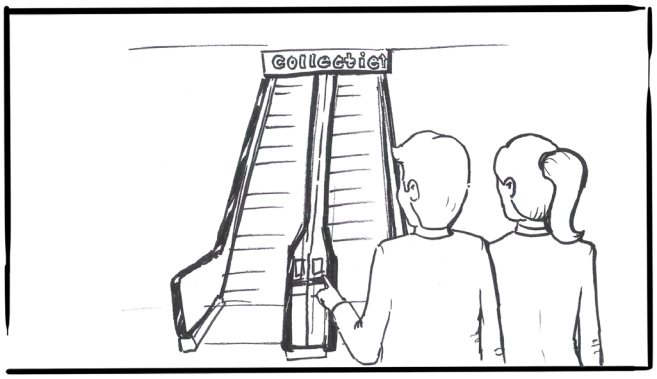
User scenario

This chapter explains the intended scenario of the design. This scenario consists of three main interaction points: the moment where visitors need to be persuaded to **approach the design**, the actual **interaction with the interface** and the remaining visit to the museum using the **new visiting scenario**. This chapter is based on the observations and visitor interviews in this project.

Two visitors. For them the Van Gogh Museum was a must see when in Amsterdam. They are interested in art and have an average knowledge about Van Gogh. This makes them experienced museum visitors. They start their visit with a positive mood and are interested to see what they will learn.

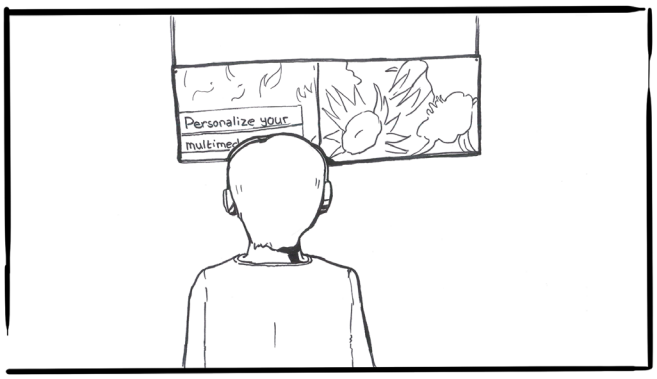
Our duo has just entered the museum at the entrance hall. After standing in line outside the museum, standing in line to drop their jacket and standing in line to receive their multimedia guide they are tired of the practical tasks they had to complete. They want to spot their first painting and engage with the art. They are however **unsure** where to go to find the first paintings because they are unfamiliar with the layout of the museum.

Once of the visitors spotted the right direction by looking at signs or observing other visitors. The visitors enter the escalator to the Rietveld building.



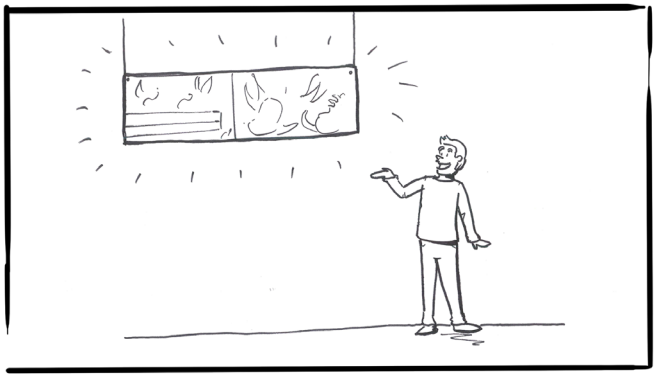
Our visitors arrived at the top of the escalator in the Rietveld building. After taking a moment to process the new environment, which is quite a contrast to the light, modern entrance hall they just came from, they start looking for the start of the exhibition.

Our visitors are **unsure** where to start their tour, they do not yet see anything familiar.

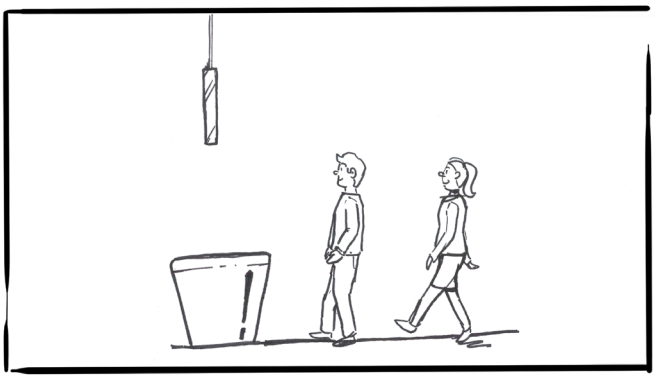


One of the visitors spots a well known painting above the design which is already in use by a number of other visitor groups.

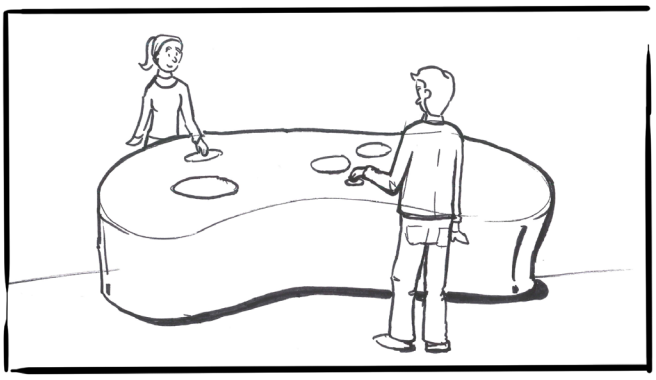
The visitors feel **confident** and **invited** to approach the design.



Both visitors approach the design.

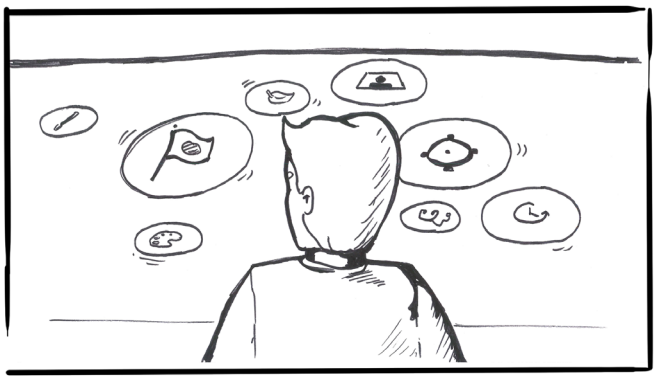


When arriving at the design it becomes clear that the design will provide them with a more in-depth multimedia guide experience.



The visitors start to engage with the design which allows them to select topics they want to elaborate on during their visit.

During the interaction the visitor feels **guided** through the process in a **personal** way. The interaction should feel **fluent** and **professional**.



The visitors should start their exhibition in a **confident** way. They know the tour they are about to follow is tailored to their own interest which will improve their visit and are therefore willing to follow the directions provided to them.

Getting attention

To get attention of visitors the design should connect to the needs of visitors at the moment they see the design. When visitors enter the Rietveld building, they are not quite sure where to start the exhibition. The design should therefore provide a clear starting point by showing something that visitors can recognize.

In the design a screen is placed above the interactive surface which displays a recognizable artwork. A screen above the surface was chosen because it will be visible even when the table is crowded and the surface of the table is therefore obscured.

Because the design can only be used by visitors which are using a multimedia guide during their visit it can be assumed that the main visitor categories using the design will be Creatives and Challengers. Based on the description of these visitor categories on page 19, the needs of visitors at this moment can be identified.

Creatives are looking for more in-depth information from proper sources while Challengers can be attracted by showing an interactive experience and the promise of a more fun visit.

Since Challegers are interested in new technologies, games and the internet it is expected that they are naturally drawn to an interactive object (page 19). To further encourage Challengers to approach the interactive surface the screen above the surface shows an animation, highlighting the interactive aspect of the interface.

To attract Creatives and illustrate the in-depth information the design will show an x-ray overlay of the artwork, as well as illustrating the personal story of Van Gogh by displaying a letter. All of these elements will be animated across the screen, showing the interactive element of the design.

Although the screen above the design will be the most important in getting attention from visitors and providing visitors with a better start of the exhibition, it is not the only touch point where the design can be promoted. Other moments where visitors can be made aware of the design are for instant the screens in the ticketing line, the website, the pre-visit practicality mails, the Wi-Fi access screen and the introduction screen of the multimedia guide.

Figure 45. The screen above the table shows a familiar artwork.

These themes
also interesting fo

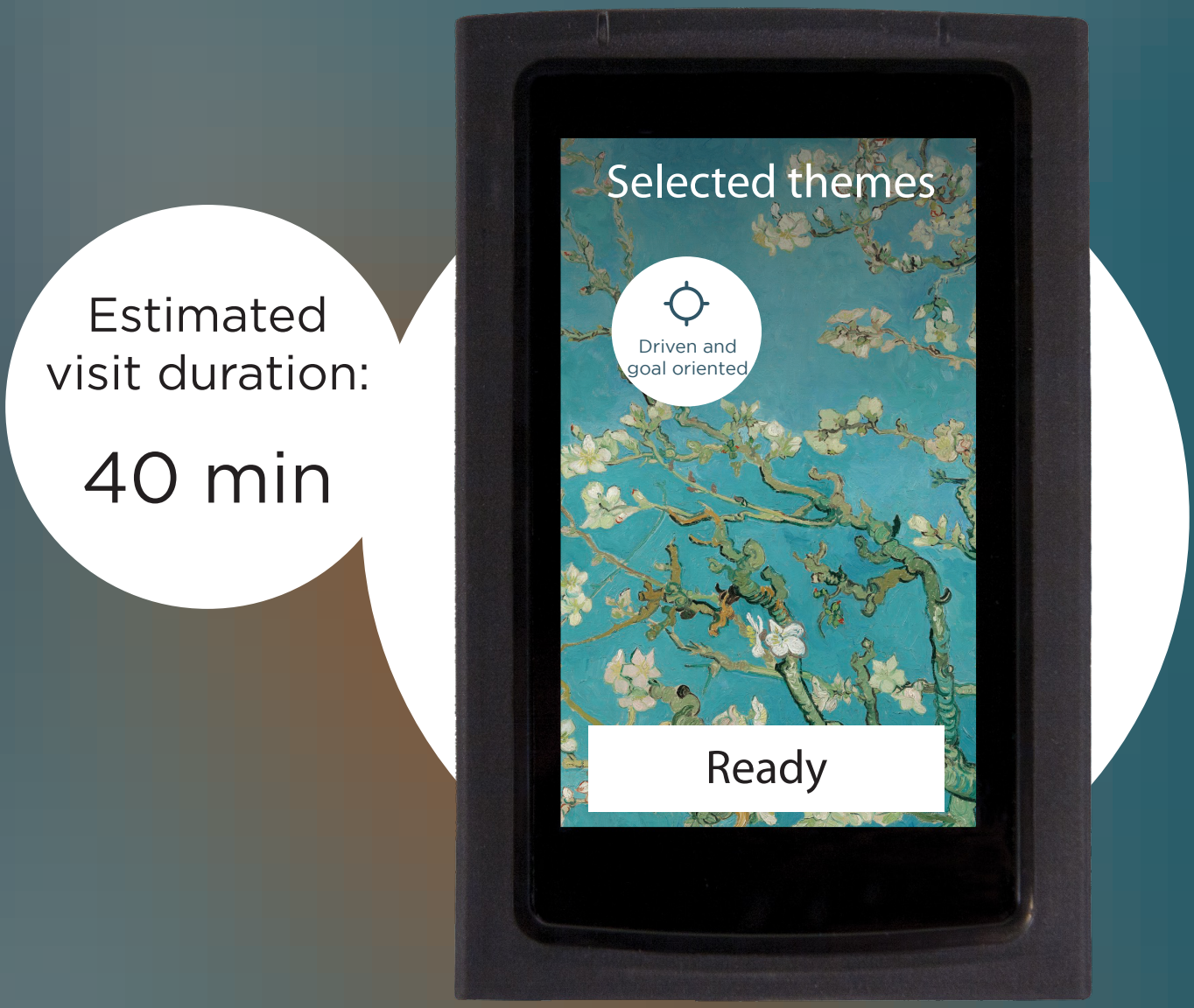


Figure 46. A full scale detail of the interface.

Interface design

The goal of the interface interaction is to make visitors start their exhibition tour in a confident way. Visitors should have the feeling that they are personally guided in creating a tour that is relevant to what they want to learn, see or experience during their visit. Creating the tour has to be a conscious process.

The design should give visitors the feeling they are in control about the creation of their unique, personal museum visit. The design should reflect the expert position of the museum by having a professional feel.

From this statement a task analysis and task flow were created which served as the basis of the design of the interface. This task analysis and task flow can be found in Appendix H. The size of the interface and the number of people that can use the design simultaneously was defined by looking at the reach and personal space requirements of people. This analysis can be found in Appendix I. Figure 46 shows a small portion of the interface in the actual size it will be on the interactive surface.

Based on these interaction qualities and analysis the design of the interface and interaction was created during an iterative process of which the different designs can be found in Appendix J.

The final interface design consists of three main screens that guide visitors to the process of selecting topics for their personal guide.

The next pages illustrate the working of the interface. All elaborated screens can be found in Appendix K.

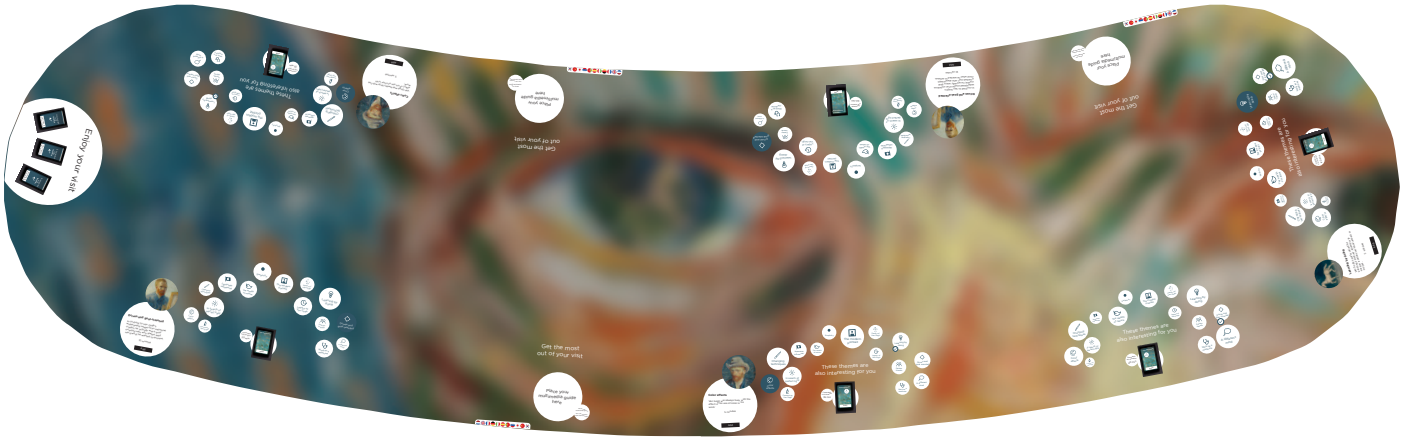


Figure 47. Final interface design.

When visitors approach the surface a simple instruction is displayed that explains the design (Figure 48). Next to that an instruction is given to visitors to place their multimedia guide on the surface of the table. In the first screen visitors have the opportunity to switch language of the interface. The interface will support all languages available in the multimedia guide,

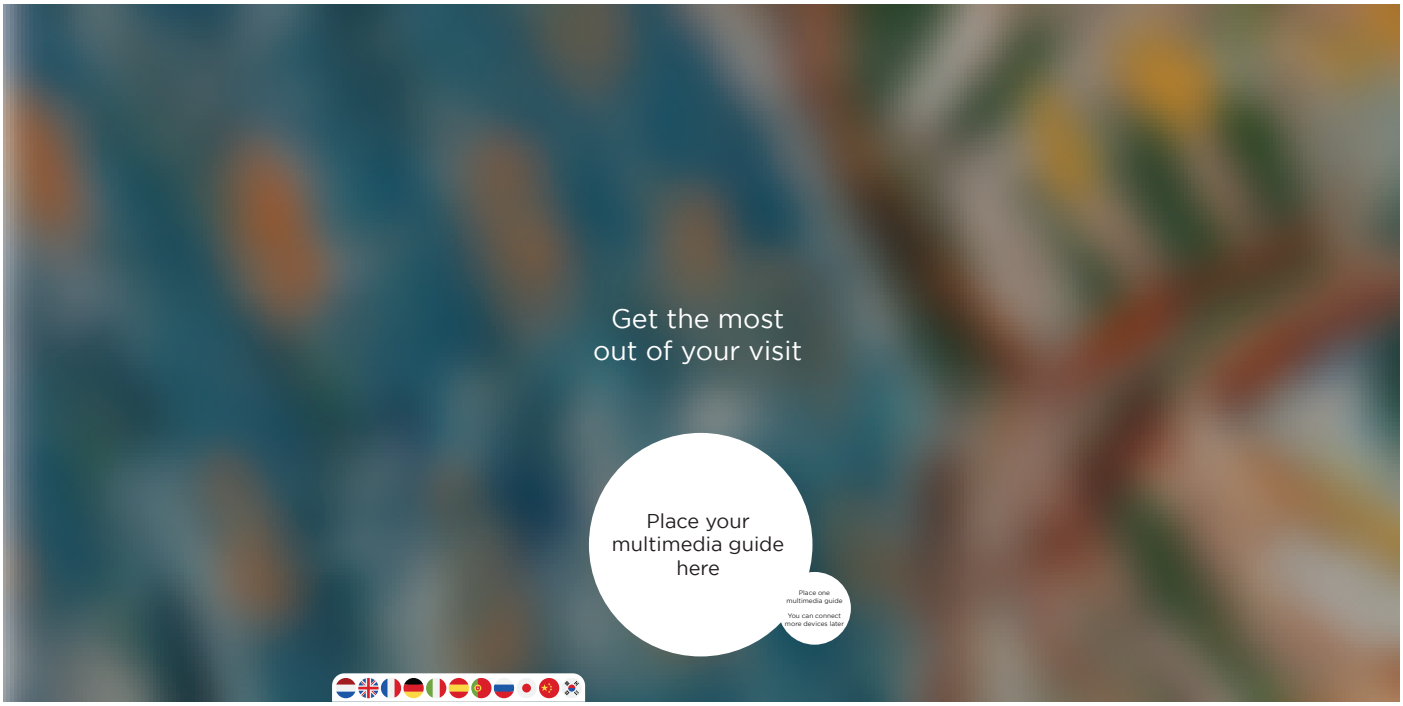


Figure 48. Start screen of the interface.

Once the visitor has placed the multimedia guide on the surface of the table, the multimedia guide device is coupled to the system and the main screen of the interface appears (Figure 49).

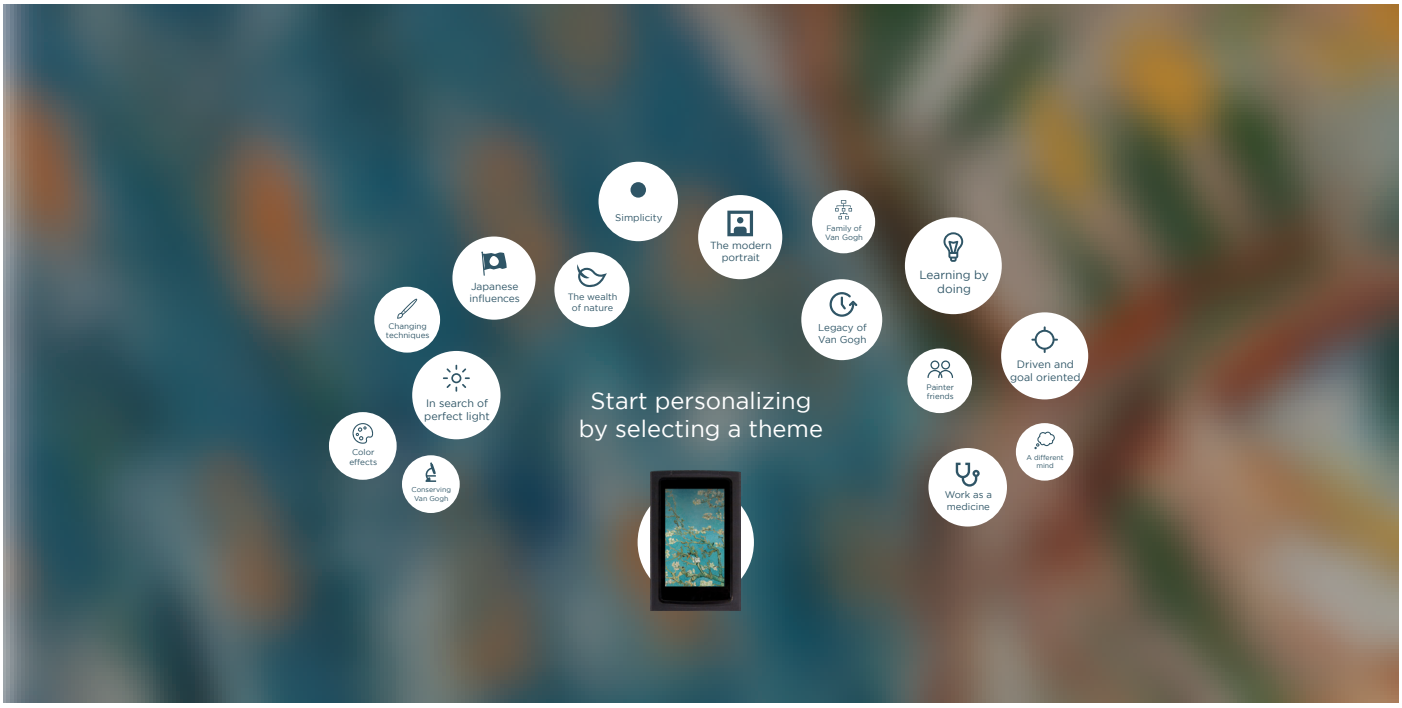


Figure 49. Topic overview screen of the interface

This main screen shows all topics that can be used to personalize the visit. This screen also shows the total visit duration, which will change based on the topics added to the multimedia guide. The topics differ in size to make some of them more prominent to the visitors, increasing the chance these topics will be chosen. This will guide visitors in making choices that benefit them and the museum.

When visitors have not added topics to their visit yet (Figure 49), there is only a minimal difference in the size of the topics. This size difference can be related to the popularity of the topics or the topics that visitors, who are already moving through the museum, are following. To make the best use of available space in the galleries the museum can decide to decrease the size of a topic that a lot of visitors are following. This will encourage new visitors to choose a different topic.

Although creating the new content of the personalized multimedia tour was not part of this project, a concept has been made for the different topics. These topics are based on topics that were used during the exhibition of the Van Gogh Museum in the Hermitage in 2012 (Van Gogh Museum, 2012). These topics are shown in Figure 50. To make the topics easily recognizable they are all paired to an icon.

When developing the content and topics it is important to create a balance between topics that are related to the career and life of Van Gogh and topics that relate to technique. For developing these topics a close look to the visitor motivations described on page 18. This will ensure the content is relevant to all visitors and especially to Creatives and Challengers.

Figure 50. All available topics within the interface.

Visitors can select a topic after which more information is displayed (Figure 52). This information consists of a description, related artworks and the amount of time the topic will add to the total visit duration.

Figure 52. When a topic is selected more information is displayed.

When a visitor decides to add a topic to their visit this topic will be moved into the screen of the multimedia guide and the total visit duration will be updated. Based on the choices the visitor makes, the system will recommend topics that it thinks will also be interesting for the visitor. Recommending topics is done by changing the size of the topics (Figure 51).

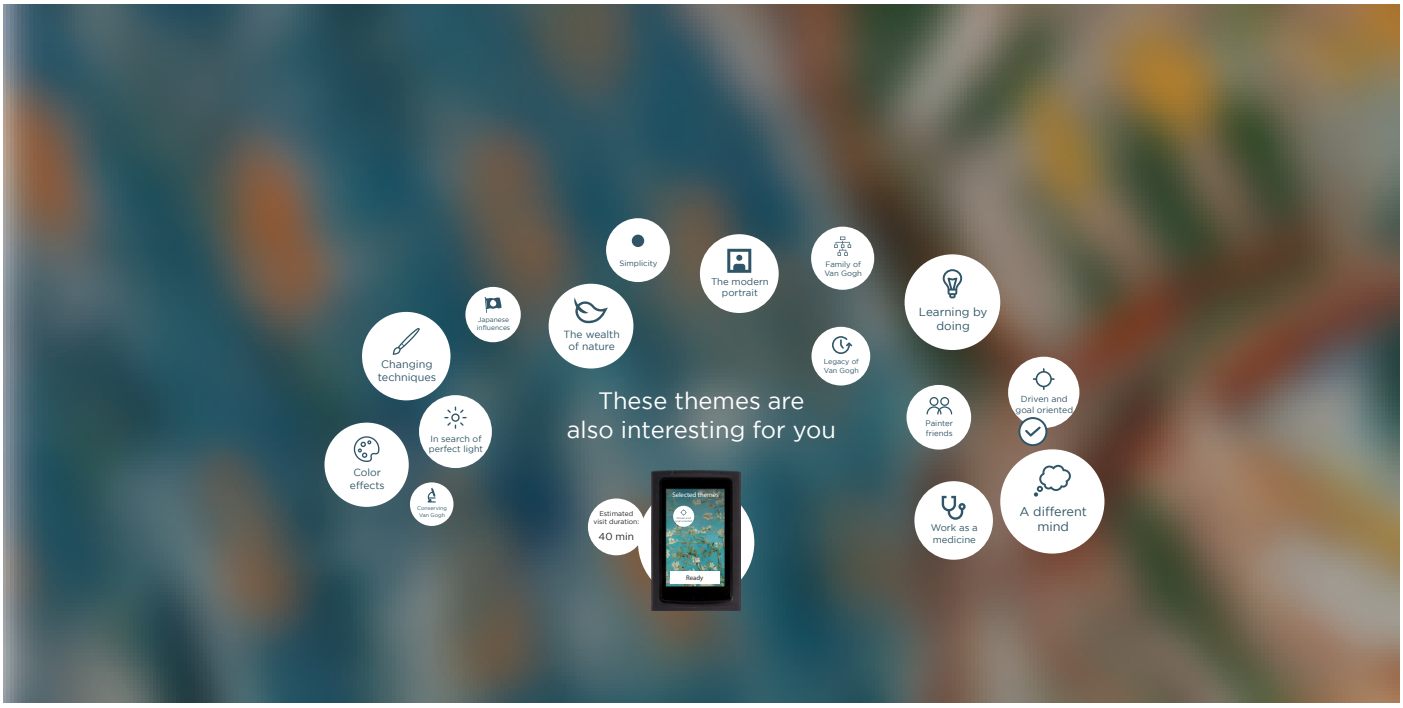


Figure 51. A topic has been added to the multimedia guide and the size of the topics has changed.

When the visitor is happy with the selected topics he presses “ready” on the multimedia guide. The multimedia guide then shows an overview of the selected topics and the amount of time the composed visit will take.

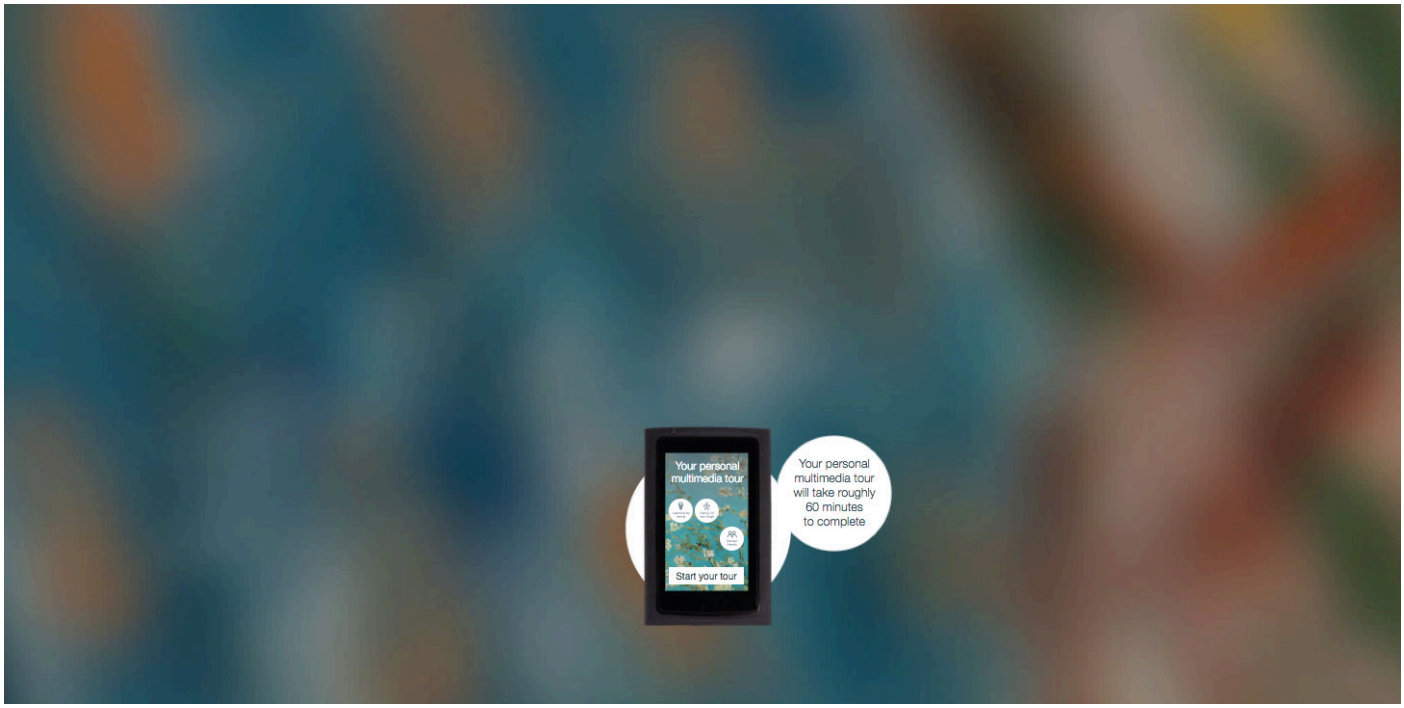


Figure 53. The interface allows multiple multimedia guides to be linked together.

After that the visitor is then asked if he wants to connect several multimedia guides together as a visitor group (Figure 53). Connecting multimedia guides will ensure the system keeps the group together during their visit even if the topics selected on the individual multimedia guides is different. After connecting multiple devices and selecting 'done' (Figure 54) the interaction with the table will end and the interaction will be continued on the multimedia guide.

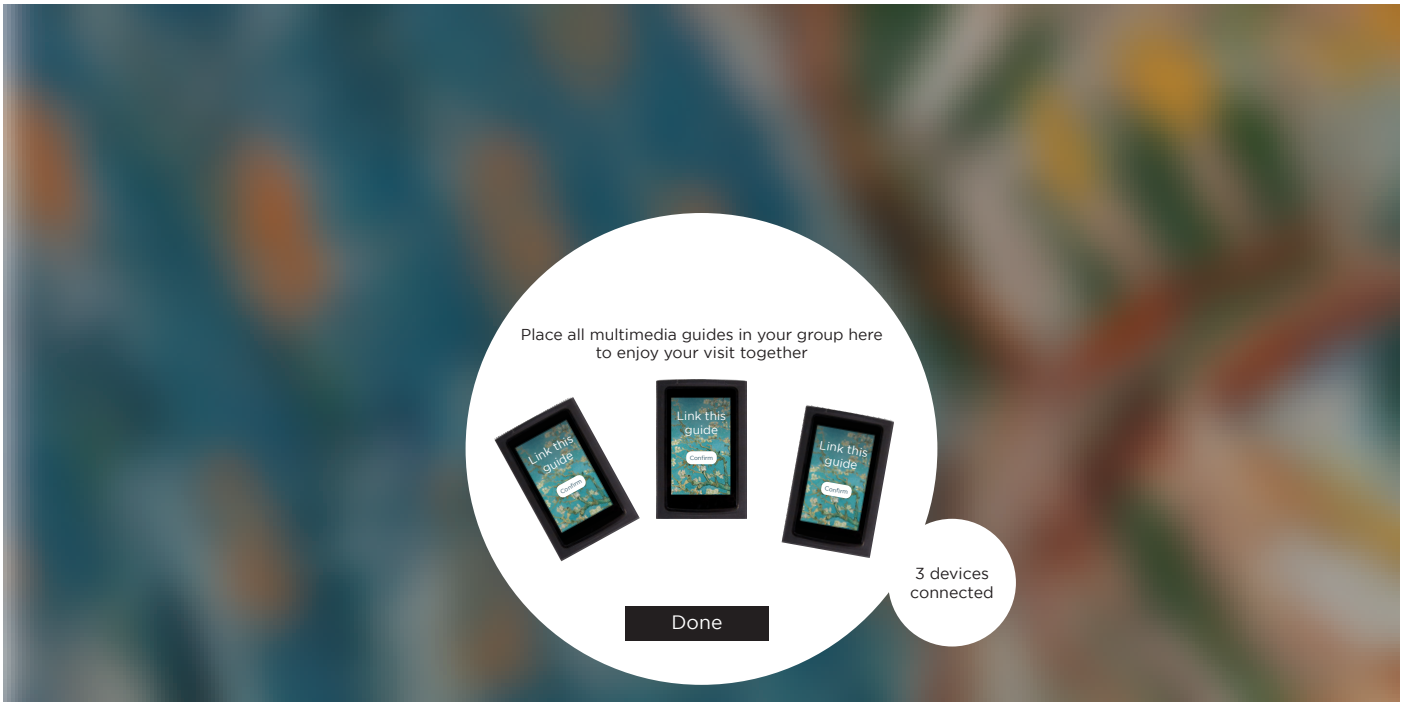


Figure 54. Linking multiple multimedia guides together.

The multimedia guide will provide visitors with an introduction and directions on where to start their visit (Figure 55). These directions are both displayed in text and through an audio introduction.

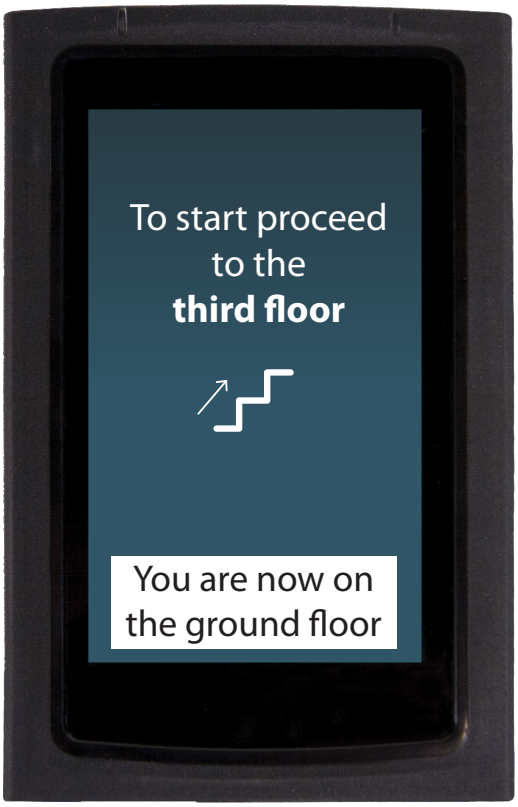


Figure 55. Instructions on the new multimedia guide.

Figure 56. The new overview screen.

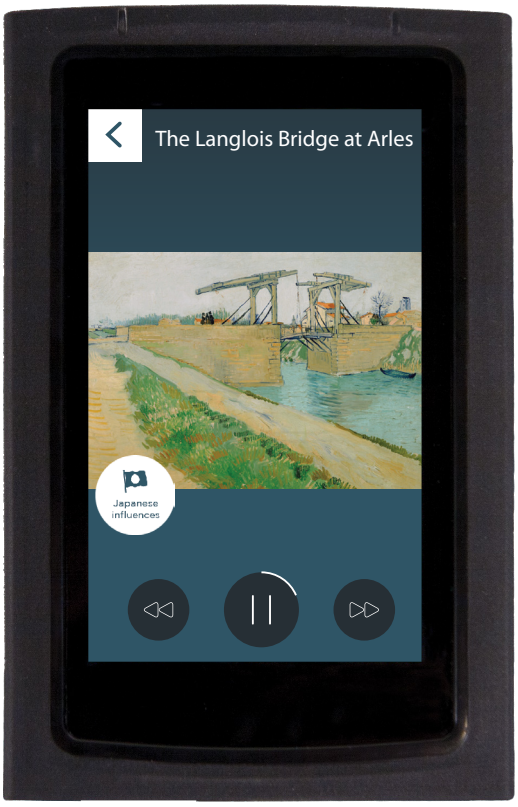


Figure 57. The new multimedia stop.

New visiting experience

Visitors who used the new interactive surface will have a different visiting experience to visitors that are using the normal multimedia guide or no multimedia guide at all.

After creating their own visit using the interactive surface visitors will be presented with an instruction on their multimedia guide about where to start their visit. Some visitors will move to the third floor, others will start on the ground floor.

During their visit the multimedia guide will present audio stops based on the position of visitors. Only stops within the proximity of the visitors will be presented to the visitors. These audio stops are shown in a specific order but visitors are not forced to follow that order. This is similar to the current highlight tour (Figure 16), visitors will still have to start each multimedia stop as in the normal highlight tour. This ensures visitors can move through the exhibition at their own pace. The location aware content is similar to the system being developed for the temporary exhibition Van Gogh and Japan (page 15). Removing the audio stop number next to paintings is necessary because visitors that are in their intensive looking phase will still want to hear all content when they see it is available. They will even want to hear the content if this is content they have already heard at another place in the exhibition.

To make the content of the personalized guide match the current state of visitors even more, the content could be linked to the visit duration. This way the system can know if the visitor is likely to be in an intensive looking state or in a cruising state. The system can adjust the amount of in-depth information accordingly.

To provide feedback to visitors about which audio fragment connects to which topic a small icon will be placed on screen when a connection exists. Figure 56 shows two audio fragments which are connected to a topic and one fragment which is not topic specific. The used icons will be consistent with the interface of the interactive surface.

The experience of visitors that do not use the service

Using the design is not mandatory for any visitor. The existing multimedia guide structure will remain in place and will still provide a good experience. The normal multimedia guide will only be replaced by the personalized multimedia guide when when a device is activated on the interactive surface. Because it is necessary the topic driven multimedia guide will work in combination with a beacon system without multimedia stop numbers next to the paintings the existing multimedia guide should be adapted to this system as well.

Visitors that decide not to use a multimedia guide will not see any change in the content of their museum visit. All labels and texts will still be available, only the multimedia stop numbers next to the paintings will be gone. All visitors will however, benefit from the improved visitor flow through the permanent exhibition.

Figure 58. A still from the video used during the user tests, showing the recognizing of the design.

Evaluating the design

The goal of this evaluation was to test the usability and user experience of the design by performing a user test. The research was split in the three parts of the scenario (page 54): approaching the design, the interaction with the interface and the new visiting experience. Separate research questions were defined for each of these scenario parts.

Research questions

Approaching the design

- To what extend does the design communicate its intentions clearly?
- Does the design evoke curiosity in both the creative and challenger visitor categories?

Interaction with the interface

- To what extend do visitors understand the goal of the design?
- To what extend are the steps in the interface clearly structured?
- Does the use of the interface result in a guiding and professional interaction in which visitors feel in control?
- Does the interface reflect the expert position of the museum?
- Where do usability flaws occur?

New visiting scenario:

- Do visitors understand how using the design will affect their visit?
- Are visitors willing to follow the directions provided by the multimedia guide?
- To what extend do visitors feel in control over their museum visit?

Participants

A total of five tests with two participants each was conducted. Participants for the evaluation represented museum visitors at the moment they would encounter the design. Visitors were recruited at the entrance hall of the museum without seeing the permanent collection or location of the design. The participants differed in age, nationality and visitor category. All visitor categories were represented during the tests.

Prototype

To evaluate the design a prototype of the interactive surface, interface and new visiting scenario was built.

Interactive surface

To give participants a realistic feel of the operation and scale of the interface a prototype of the interactive surface was built. This prototype consisted of a projector which projected the interface on a table (Figure 59). The interface itself was running on a computer which was hidden for the participants.

The touch capability of the prototype was achieved by one researcher that was standing behind the participants, outside of their field of view. This researcher operated the clicks in the prototype manually with a tablet that was connected remotely to the computer. The researcher tried to be as precise and responsive as possible when operating the interface.

The interface

The interface which was projected was built using the web based prototyping tool Axure. The interface was clickable and showed all important animations in the interface. From the 15 topics that are displayed on the interface, 6 were made clickable. These six topics were fully functional including descriptions, and full adding and removing functionalities.

New visiting scenario

The new visiting scenario was displayed using a video based on the scenario on page 54. This video showed two visitors who entered the museum, got a multimedia guide and proceeded to the permanent collection. The visitors then spotted the design and interacted with it. After they selected topics they show their museum tour to each other and see the directions on the multimedia guide.

Figure 59. Testing the prototype of the interactive surface before the user tests.

Set-up

For the evaluation a meeting room at the third floor of the office part of the Van Gogh Museum was converted to research room (Figure 60). The prototype of the interactive surface was projected on the meeting room table and the video was shown on the screen in the meeting room.

The tests were recorded on video and audio for later analysis.

The tests were performed with two researchers of which one was responsible for the testing script and participants. The other researcher was in charge of the recording and reset of the test set-up and the operation of the interface during the tests.

Each test took around 15 minutes and visitors were rewarded with vouchers to the restaurant after the test.

Procedure

Participants for the test were selected from visitors who had just picked up their multimedia guide in the entrance hall of the museum. While these visitors were led to the office part of the museum a short informal interview was conducted to determine their nationality and visitor category.

During the entire test special effort was taken in telling visitors that the design was not made by one of the researchers but that the researchers were solely asked to test the effects of the design.

Because not all topics were functional in the prototype participants were given a scenario to keep in mind when interacting with the interface.

The complete script for the user tests, including the scenario, forms and questions asked, can be found in Appendix L.

Method

After the test, visitors were asked to fill in an AttrakDiff form (Appendix L). Filling in this form allowed them to reflect on their experience and helped them in expressing their opinions.

After filling in the AttrakDiff a short interview was conducted based on four word-pairs which were already scored individually in the AttrakDiff form (Figure 61). Participants were asked to score these word-pairs together. After that these word-pairs were discussed in detail and all parts of the design were evaluated.

Figure 60. The test set-up at the Van Gogh Museum.

In control	O	O	O	O	O	O	Out of control
Forced	O	O	O	O	O	O	Unforced
Unprofessional	O	O	O	O	O	O	Professional
Confusing	O	O	O	O	O	O	Clearly structured

Figure 61. The discussed word-pairs.

Results

The test was conducted with a total of 10 visitors in 5 groups.

- **Test 1:** a couple from Mexico who where visiting Amsterdam for a couple of days. They were about 25 years old and fitted in the **creative** visitor category.
- **Test 2:** a mother and daughter from Portugal. The daughter was visiting her mother who is a teacher in Amsterdam. The mother fitted in the **conservative** visitor category while the daughter was a **creative**.
- **Test 3:** an Irish couple visiting Amsterdam. Around 30 years old. They both fitted within the **creative** visitor category.
- **Test 4:** a couple from China for which the Van Gogh Museum was their first destination in Amsterdam. They were around 25 years old and fitted in the **creative** and **challenger** visitor category.
- **Test 5:** two men from England and South Africa both around 25 years old. They fitted in the **challenger** visitor category.

All filled in forms collected during the user tests can be found in Appendix M.

Approaching the design

All participants could describe what the design is about within 5 seconds. The descriptions participants gave based on this first visual information ranged from "Something to personalize my visit." to "A surface that recognizes your multimedia device so that you can change the theme of your visit." All participants indicated they would be interested in approaching the design to get to know more.

Interacting with the interface

The first step of the interaction, placing the multimedia guide on the surface, was completed by all participants without problems.

In the overview screen some participants paused for a long time to read all options. All participants instinctively tried to touch the surface.

For two of the five participant groups the first topic they tried to select was not made clickable. This resulted in these groups being hesitant to try other topics since they expected them not to work either.

After the topic selection some participants had trouble confirming their selection. Two participants mentioned they would simply lift the multimedia guide off the surface when they were done.

The results of the AttrakDiff survey can be found in Appendix N. This survey showed that the design has a good balance between pragmatic and hedonic qualities (Figure 62), meaning it is both task oriented and offers a good interaction experience. The scoring of the discussed word-pairs is displayed in Figure 63.

New visiting scenario

Three out of five participants mentioned they like the fact that the multimedia guide gives them directions. Especially during busy times in the museum.

One participant (test 5) mentioned that he would not like to lock the route through the museum at the design. Instead he would like to see a functionality that allows him to change the selection of topics and the order of topics even when he is in the galleries.

For three out of five participants it was unclear what the consequences of using the design for their museum visit would be. They were not sure if they would be able to change the route through the museum and mentioned that they were unsure of what a visit with others in their group would look like.

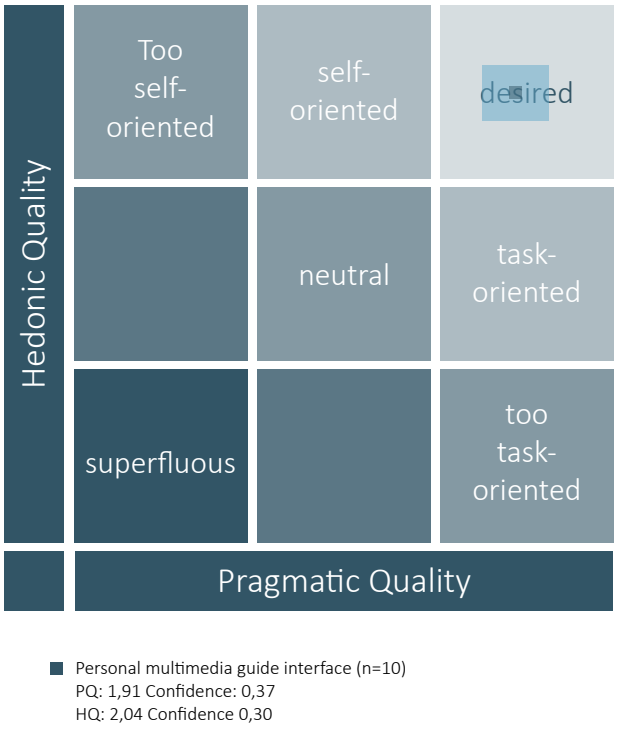


Figure 62. Results of the AttrakDiff survey.

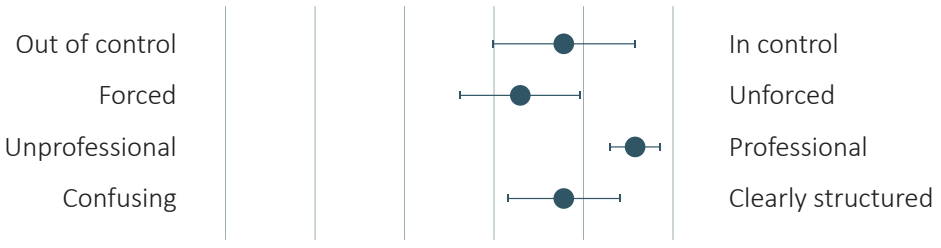


Figure 63. Results of the scored word pairs.

Test 1: “That it [the interface] is not that clearly structured is also kind of appealing. When you are going to go to something [an exhibition] that is already so clearly structured it almost like kind of bores you. So you need to have the sensation of mixed things that you can structure and that you can order.”

Test 2: "Either you agree on the themes or you are not going to see the person because your doing your own tour?"

Test 2: "It would be confusing if you had to go to the third floor and then to the first floor again."

Test 3: "The descriptions [of the topics] make the design clear and professional."

Test 5: "It [the design] shows the museum going forward in the digital age, I would enjoy it, I think people will enjoy it."

Test 5: "There is something about the interface that gives me a 90s feel."

Test 5: "It would be nice to have even more personalization in the themes by using sub-themes, mid life, early life, late life. I would like more options, even if I won't use them."

Test 1: "[I feel] in control because it [the design] provides an overview of what the museum is offering and you an select from that what you want to see."

Test 2: “It’s not always in museums that you like the way things [exhibition tours] are put together, it is nice to be able to personalize.”

Test 2: "It must be nice to go to the museum several times and have different experiences."

Test 4: "Sometimes it’s hard to reach your goal [during a visit]. Now you can have a more confident museum visit."

Test 5: "When I only add three things [topics], can I change halfway through [my visit] what I want to do still? Can I change themes when I’m in the exhibit itself?"

Test 5: "It would be unclear if the routing went from floor 3 to 1 to 2."

Test 5: "It [the interface] is clearly structured but maybe to clearly structured. I would like some more freedom."

Figure 64. Quotes from participants of the user tests.






Figure 65. A selection of pictures of the user tests.

Conclusion

All participants were positive about being able to personalize their own multimedia guide. It was mentioned several times that this would positively influence the museum experience. Participants liked the fact that they can filter the content of the museum towards something that they are interested in. One participant said that it would make reaching visiting goals significantly easier.

Overall the design performed well in conveying the intended interaction qualities but experienced a few shortcomings in explaining the consequences of the design for the museum visit.

Approaching the design

All participants to the user tests could explain the basic function of the design within the first five seconds of looking at it.

After seeing the first visual of the design and explaining what they thought it would be, all participants indicated they were interested in getting to see more of the design. All participants would approach the design if they would encounter it.

This confirms that the embodiment in combination with the banner above the design communicate the intention of the design clearly.

Interaction with the interface

Based on the interviews with participants and the AttrakDiff survey it can be concluded that the interaction with the interface has a proper balance between being goal oriented and pleasant to use. Several participants mentioned they thought the interface was easy to understand, and did not have to many options or functions.

All steps in the interface were perceived as clear and structured. Two out of five participants explicitly mentioned the professional feel of the interface which had largely to do with the displayed descriptions of the topics.

None of the participants experienced difficulty in navigating the interface. The only case participants hesitated to touch the interface could be explained by the fact that not all buttons of the interface were active in the prototype.

One of the usability flaws of the interactive surface is the fact that visitors need to place their multimedia guide on the surface for it to connect. This means visitors have to take the multimedia guide from their neck and place it on the surface. This can create a cumbersome moment in the interaction with the interface which occurred at two of the five tests.

New visiting scenario

All participants were positive on the principle of the design: personalizing your own museum visit. It was mentioned several times that this principle would positively influence the visitor experience.

The consequences of the topic selections were however in some cases unclear. For some visitors it was unclear if the order in which they selected the topics had any influence. Other participants did not understand that the multimedia guide would provide custom information and thought the only point of selecting the topics was to create a route through the museum.

Four out of five participants mentioned they would follow the directions provided by the multimedia guide.

One participant mentioned he would not like to fix his entire visit during this interaction. He would rather have the possibility to still change the selected topics during his visit.

Discussion

Limitations of the interactive surface prototype

The prototype of the interactive surface was a projection on an existing meeting table at the Van Gogh Museum. This resulted in the prototype being projected at a lower height then desired. Even though the interface was projected at a reasonable scale this lower position made it hard for visitors to comfortably interact with the surface. Together with the low resolution of the projector, the screen of the projected multimedia guide was hard to read. During testing this was solved by printing the interface of the multimedia guide on a higher resolution and providing it to the participants at the right moment in the test.

Limitations of the interface prototype

The prototype of the interface has only six topics that could actually be selected. The other nine topics were static. This created confusion among participants that first selected a static topic. Because selecting a non-functioning topic would result in participants hesitating to try other topics these participants had to be encouraged to keep trying new topics until one of the topics responded.

The responsiveness of the interface was acceptable, regarding the level of 'wizard of oz' involved but created some delay in the interactions. This was especially noticeable during test 4.

Test procedure

Before the test, special effort was taken in telling participants that the researchers were not the once who had designed the experience. Furthermore, there was no promise of a gift before the test. Still, some socially biased answers could have been given, especially in the survey part of the tests.

Because only 5 tests were conducted the AttrakDiff survey was only filled by 10 participants. This is a limited number of responses and makes the validity of the survey questionable. Because the selected participants represented all museum visitor categories, it is expected that the results would not differ significantly if the AttrakDiff survey was filled by a larger number of respondents.

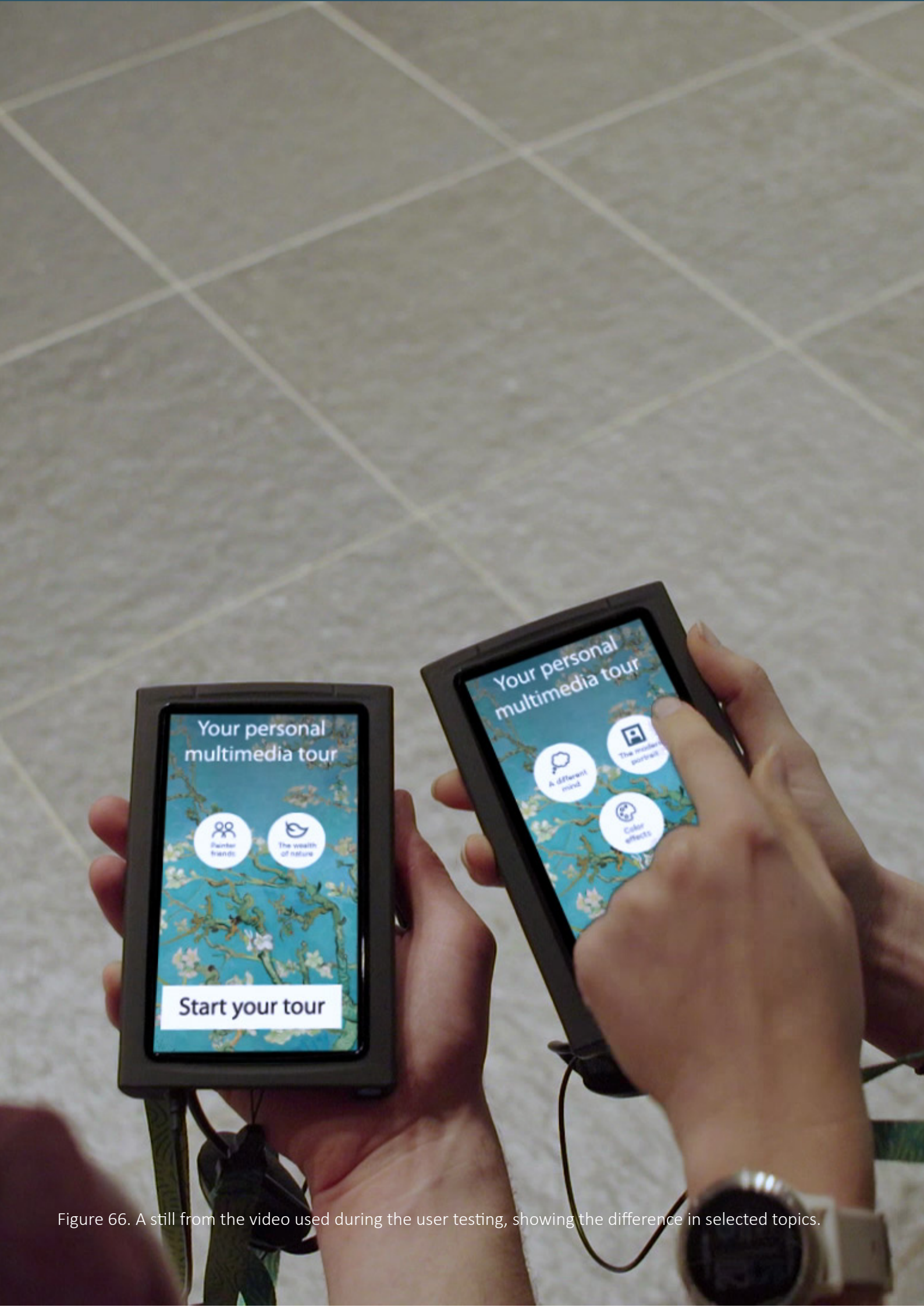


Figure 66. A still from the video used during the user testing, showing the difference in selected topics.

Recommendations

Although the evaluation of the design showed that the principles of the interaction worked properly, there are some aspects on which the design could be improved and elaborated.

Explaining the story-structure of the personal multimedia guide.

One of the aspects of the personal multimedia guide that proofed to be unclear during the user tests, was how the selection of a topic would change the story of the multimedia guide. During the user tests, the design did not explain that visitors were adding topics to a basic story structure. The final interface should contain some explanation of this. Explaining this could be done in the form of a visual similar to Figure 43.

Interface interaction.

Although all steps in the interface worked as intended, some changes could be made to make the interface even more intuitive. Instead of a simple touch to add, a drag and drop system could be applied.

Changing the selected topics during a visit.

At the moment, no attention was given to how visitors can change their selected topics during their visit. This could be an important feature, since one out of five participants to the user tests mentioned it. Further thought would need to be given to decide if this would be an important feature and how this will be implemented.

Elaborate on personalizing several multimedia guides at once.

A step that was not tested during the user tests was how multiple multimedia guides could be linked together as a group. The design should allow for two possibilities on this topic. One, connecting multimedia guides with different topics, so visitors move through the museum at the same pace, while getting different information. Two, copying one personalized multimedia guide to another, to allow visitor groups to get the exact same content at the same time. At the moment, only the connecting of the multimedia guides had been elaborated on the interface design, the copying of multimedia guides has not been elaborated.

Form, color and corporate identity.

In the final design of this project, only superficial attention has been given to the embodiment of the interactive surface and interface. When the Van Gogh Museum decides to implement the design, more attention should be given to the form and color of the interactive surface and the interface so that they match the design of the exhibition and the corporate identity of the Van Gogh Museum.

The design will form a recognizable beginning of the exhibition

Creating a unique museum visit for a better experience

Receiving meaningful directions to improve the visitor flow

Figure 67. Key elements of the design.

Key characteristics of the design

Because the design is still conceptual and will need to be developed into a complete solution, the form, placement and functionalities of the design will be subjected to change. A set of key values can help translate this concept into new designs.

Function

In its most basic form the design can be explained as followed: a system that guides visitors in creating their own museum visit, connected to the visitors personal visiting goals, which will benefit the visitor experience. This creates an intrinsic motivation for visitors to follow directions provided by the museum to optimize the visitor flow.

Placement of the design in the customer journey

The design concept is placed at the beginning of the permanent exhibition, where it will function as a recognizable starting point of the visit. The design is not a new wayfinding tool but rather a part of the exhibition. Meaning it provides relevant information to visitors. The design therefore features a screen which displays recognizable artworks and demonstrates the function of the design.

Because this concept makes use of the existing multimedia guide infrastructure, it was decided to focus the design on the Creatives and Challengers visitor categories. This choice informs the choices for the displayed content on the screen above the design.

Story structure

The strength of the current exhibition is the chronological story structure. This is preserved in the design concept. Visitors will choose topics but will always follow a continuous, logical story through the exhibition, on which the personally selected topics are an addition.

Visitor phases

The museum can utilize the design in directing visitors to specific starting points in the exhibition. These multiple starting points will create a mixture of visitor phases in the galleries, which will improve the visitor flow through the museum.

Figure 68. A still from the video used during the user testing, showing the directions users receive.

Development

This design concept introduces a basic version of a personalization system that can be elaborated into a more complex system with a high number of features. If this design would be implemented in the museum, a number of steps need to be taken.

First, the content of the personal multimedia guide needs to be developed. This includes the development of the reverse-chronological storyline and the content for each topic. Recommending different topics will, at this stage, be done using the input of other visitors. When a large number of visitors choose a certain topic, the design will recommend a different topic to new visitors. Once all content is made, the interactive surface and interface need to be redesigned to keep in mind the form, color and corporate identity. The interactive surface then needs to be installed on the ground floor of the Rietveld building and the connection to the existing multimedia guide infrastructure needs to be made.

During this first stage it can be expected that all visitors using the design will be sent to the third floor of the Rietveld building. Once the design has a large reach and a sufficient amount of visitors is using the personalized multimedia guide, the chronological storyline should be developed.

In time, the system should be developed to use live positioning data from other multimedia guides in the building to try to maximize the use of available space in the museum. Recommending certain topics and choosing the chronological storyline over the reverse chronological storyline can then be done by analyzing these live data sources. The total estimated visit time, which is displayed on the overview screen of the design can, for instance, take into account the number of visitors in each part of the museum. This will create a more accurate estimation of the time needed to listen to the content of the selected topics.

When the design is fully functional, the Van Gogh Museum can look at other ways to provide data to the system and use data that has been gathered by the system. For instance, the selected topics could be used as an input for the newsletters visitors receive after their visit. Furthermore, the design can benefit from existing data about visitors such as entry time, and the way visitors bought their ticket. Combining all these different data sources will raise ethical issues which should be considered.

Figure 69. The final design concept.

Conclusion

This graduation project started with the following assignment:

Design a digital media solution that can improve the visitor experience at the Van Gogh Museum by improving the visitor flow through the permanent exhibition galleries of the museum.

By understanding the current visitor experience at the Van Gogh Museum, looking at goals and motivations of different visitor categories to the museum and looking for literature on museum visiting phases, a design brief was composed. This design brief described the goal of the design, which was to provide two entry points to the permanent exhibition of the Van Gogh Museum. This way the visiting phases would be mixed in the available space.

By placing a design intervention in the museum, it was discovered that providing visitors with directions that are meaningful to them, would create both a better museum experience and a better visitor flow.

The final design consists of an interactive surface, placed at the beginning of the exhibition. Visitors can use this surface to personalize their own multimedia guide. This personalizing is done by adding topic related content to an existing story structure. This ensures all visitors follow a logical story through the exhibition but receive additional content on topics they find interesting. Because the design can only be used by visitors that decided to use a multimedia guide during their visit, the design was developed with the Creatives and Challengers visitor categories in mind.

The design makes use of the different goals of visitors, by letting them compose a unique and meaningful museum visit that fits their personal goals. Since visitors have composed a museum visit themselves, the museum has the opportunity to create an optimized visiting path for each visitor. Keeping in mind both the experience of the visitor and the available capacity throughout the museum.

This design was elaborated and evaluated during a user test with museum visitors. Together with the literature research on the topic of visitor phases, these tests proved the potential of the design for a positive impact on both the visiting experience and the visitor flow.

Figure 70. A unusually quiet moment at the most popular location in the Van Gogh Museum.

Reflection

Discover

This project started with a broad scope which involved an especially broad target group. People visiting the Van Gogh Museum come from all over the world and all bring their personal needs and goals. Furthermore, there was a large amount of mostly quantitative data available the museum. I found structuring this target group and all available data a daunting task. It was hard to filter all relevant data and process it into something that could be used for design.

Performing visitor interviews at an early stage of the project was not only useful, it was also a pleasant experience. Taking with visitors about how they experienced their museum visit provided the qualitative proof of all models and literature found.

Define

The research done during the discovery phase resulted in the design brief in a natural way. However, the change in the project from the research to the designing phase was hard. I had the feeling I had to conclude all research before starting my design phase and defining the design brief resulted in even more questions I felt needed answering. At one point in this defining step I decided to "just go out there and try something" which helped enormously in further defining the direction of the design by setting up conditions.

Design

For me, the designing part of the project proofed to be highly iterative. The design was made with a lot of feedback from experts at the museum, students from IDE and the museum futures lab and my supervisor team. Although changing the design time and time again was sometimes frustrating, the design benefited enormously from this approach. With every iteration the design was refined in form and function this resulted in a positive user test.

Completing the circle by showing the final design to visitors and asking their feedback was an equally pleasant experience as the first visitor interviews and the additional research. Visitors proved willing to help (with over 75% of the visitors asked to participate saying yes) and provided valuable feedback.

Deliver

Since I was already working on the final version of my report during the first week of my graduation, producing the graduation deliverables went smoothly. I feel the final report gives a good overview of all work done during the project and the argumentation that lead to the design of the personal multimedia guide.

The planning I made during the set-up of this project has been my guidance throughout the project. In the end, this report is delivered one week later than was specified in my initial planning. Graduating for only four days a week helped greatly in staying on schedule. It was nice to be able to combine my graduation project with running my own company and coaching students in the video for designers bachelor elective course, but this also made effective time-management important. At times I had the feeling I was busier planning everything than actually producing results.

Now that I am nearing the end of my graduation I am looking back at a successful design project. It has not always been easy or fun but I found the topic of this project very interesting and finding the balance between efficiency and experience motivating.

Although it might be hard to actually place such a big object in the Van Gogh Museum, I feel the final design of this graduation touches on a lot of needs of both visitors and the Van Gogh Museum. I believe it can truly improve the experience of visitors and simultaneously provide a framework that the Van Gogh Museum can use to show that they are moving towards the digital age.

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