Open studio

Design for participatory art in the museum
Abstract

How could public institutions like art museums open up a conversation with their audience? The intent of the project was to explore the influence and potential of digitalisation in the physical space of a non-commercial public institution, if the audience and the institution would both benefit from technology, if the political structure of the institution would become more democratic and if the audience would take the initiative and be willing to generate their own voice in the institution.

The project took an explorative approach starting with questioning the status-quo, understanding the design context, analysing, proposing and validating design directions in the end. The result was considered as the very first proposal and suggestion of how art museums could keep themselves relevant in the digital era.

The result is a service called <open studio>. It enables visitors to contribute to and interact with a virtual exhibition constructed by the creations they made in workshop programs in the art museum. It provides an overtime engagement with the visitors by illustrating the invisible dimension of time in tangible creations on a digital canvas.

Project website: http://www.openstudio.io
Creative workshop,
Bildmuseet
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At the entrance of exhibition «Lumière», Bildmuseet
Art is a dialogue.
Museums are considered as a space to host and narrate history from the past, knowledge of today and imagination for the future. Since every era has its own challenge, nowadays museums are seeking for a new identity in the digital age. Artefacts that were once unique in museums can be found and accessed online as pieces of duplicated information, printed on souvenir t-shirts for visitors to wear and bring back home, or even cited and interpreted differently in others’ projects. On one hand this means that museums no longer represent only the physical space they occupy, the information they host can now be extended into a larger scale, which can be seen as an opportunity to reach out to a larger audience without the constrain of their location. On the other hand, it challenges the traditional concept that museums have to occupy a physical space to fulfil their role as knowledge enablers.

Digital technology offers various ways for the audience to look into and experience the artefacts. Using different media, a holistic package that addresses different perspectives of an exhibition is widely adopted in museums, i.e. a combination written text, audio and video interviews of the artists, guided tours etc. This makes viewing experience flexible and adaptive, so that visitors with different backgrounds and expectations can feel welcomed and satisfied.

This transformation is not only technology driven. The desire and expectation from the audience has been changed due to the adaption of digital evolution. Now audience has “a willingness to challenge, to exchange views and to be a participant through social media and digital platforms.”[1] In return, museums started to open up possibilities to actively engage their audience through a variety of activities i.e. workshops that address different target groups, online debate and comment of an ongoing exhibition etc. These programmes provide the audience the opportunity to simulate, reflect and build up their own point of views, which strengthens the institutional role of museums as “knowledge ambassadors”.

This participatory aspect influences the sociability of museums. When the audience is highly engaged, the conversation can be shifted from museum-audience to artist-audience, or even audience-audience, thus creating a sense of community. This boundary effect can be seen as a reinforcement and evolution of the contemplation and consolidation that museums aim to simulate.

These phenomena lead to the initial questions of the project: How might digital revolution influence the traditional identity of museums as a culture and knowledge facilitator? How might museums evolve continuously to provide an attractive space for both artists to work with and audience to participate in? How might the relationship in between these players: the artist, the museum (the curator) and the audience evolve in this information era?
The project is in collaboration with Bildmuseet, Umeå University. Bildmuseet is a venue for experiences, reflection and discussion. The museum exhibits contemporary international art, photography, architecture, design and other forms of visual culture, along with art historical retrospectives.[2]

The main person in contact is Lisa Lundström, curator of education in Bildmuseet. The team of Bildmuseet consists of 15 people. They are responsible for exhibition arrangement and other relevant activities in relation to the ongoing exhibition. The team shows interest in digital implementations of the works for visitors.
Opportunity & Constrain

Exhibition period in Bildmuseet is on a 3 months basis of rotation. There is no permanent collection in the museum to display. This means that the result of the project has to be flexible and sustainable so that it can be implemented and adapted to the constant change of content. However, the constrain can turn into an opportunity and answer the question “What would a museum built from the ground up for speed and agility, rather than stability and longevity, look like?”[3]

The fact of rotational exhibition also defines the project scope within a service design for generalised exhibitions rather than exhibition design. This should open up possibilities for a wider application range of the project. Besides, the outcome of the project has to take maintenance effort afterwards into consideration.

As a 5 months degree project, it is difficult to schedule a validation phase to test out details of interaction for implementation. Due to this constrain, the result of the project should stay in a conceptual level with concrete support from research. Several signature touch points of the concept will be visualised in detail.

Language barrier should also be taken into consideration when conducting ethnographic research with the audience, concept refinement and validation phase.

Design method

The project imagines a brand new service that doesn’t exist beforehand. Under this circumstance, the project takes an explorative approach that encourages hypothesis and experiments in the early design phase. The project doesn’t naturally come with a problem to solve, but it is more considered as a proposal of the “what ifs”.

Instead of following strictly a user-centered approach, the project aims to play with a <user-validated approach> that hypothesizes design directions first and validate those directions with users in a later phase of the design process. The location of Bildmuseet also enables early and iterative experiments. Design activities are scheduled in short iterations that constantly goes back and forth in order to achieve an outcome with rich feedback and support.
The choice topic addresses my personal interest in answering how digitalisation might influence the approach we learn, reflect and share knowledge and culture. I see technology as a new toolbox that enables communication to happen with different experiences. Since interaction design expands quickly into service design, it is important for interaction designers to be “media literate”, being conscious when to choose, reflect and offer a holistic package of information that includes various of media facilitators. This is especially interesting when information doesn’t only hold a digital position, but occupies a physical space as well, which offers a wider opportunity to communicate, simulate and inspire.

The traditional passive self-learning activity can evolve into a more active and dynamic one once facilitators like museums are introduced. I believe learning from and with others are as important as learning by self. Although it is difficult to quantify the public benefit immediately, I believe the social dynamics and impacts museums create will continue standing on the edge of our time.

Personal interest
The initial intent of the project is to explore how digital implementation can provide the audience with easy access to information, increase their enjoyment and understanding of art, entice them to explore deeper content, provoke thoughts and invite them to participate[5]. In this case, the audience is not only seen as individuals, but a collaborative community as well. The dynamics happens in between one another should empathise the goals listed above. In a larger context, this participatory aspect impacts the non-participators by increasing the presence of the museum.

The project intends to look into other aspects that contribute to the mutual benefit of the museum and the audience. The outcome should provide future and desirable directions and interaction design practices in this area.

**Vision of outcome**

Visitors in creative workshop, Bildmuseet
The initial intent of the project is to explore how digital implementation can provide the audience with easy access to information, increase their enjoyment and understanding of art, entice them to explore deeper content, provoke thoughts and invite them to participate.
In exhibition «Wanderism is a state of mind», Bildmuseet
Making personal connections with museum collections might make people feel better about themselves and more connected to the content, but do they discover anything unexpected? Do they work out something difficult? Do they learn anything new or are they simply re-enforcing what they already know? [6]

02 Research

The project started with the assumption that nowadays audience in art museums are not only passive information consumers and plenty of pioneer museums have taken the initiative to engage their audience.

With the phenomena and several practices as design background, the research phase of the project aimed to:
- Get a better understanding of the phenomena from the perspective of art museums and their visitors
- Investigate Bildmuseet as a design context
- Review related theories and design practices
- Define design directions for ideation
- Mark down design principles or elements for concept evaluation
Primary research

The research phase began with primary research in Bildmuseet. The intention was to use first-hand information to narrow down and define several channels to experiment the concept of participation.

Contextual interviews and observations
Conversations and observations were conducted with visitors and museum staff in the design context including workshop and guided tour programs. The content of contextual interviews with visitors in Bildmuseet were focused on 3 aspects: aesthetic experience, community and digital culture in art museums. The goal was to understand the behaviour, need and desire from visitor’s perspective. Samples of visitors were from different age groups, alone or in company with others. The investigation target shifted from general public to the exceptional visitors that would offer surprise and new insights in the later process.

In general visitors were used to comfortably consuming information in a culture institution with a passive manner. They were a bit intimidated by the open-ended questions at the beginning. To tackle this, the focus of the investigation was shifted towards visitors’ journey, how they found the place and why did they decided to come here, if they had plan afterwards etc. This resonated with the design method defined in the project introduction that users might not know what they need and desire.

Expert interviews
Expert interviews were carried out and documented for insights and inspirations. The content of expert interviews varied according to the background of interviewee. Interviewees involved in the design context includes:
- Director of Bildmuseet who leads the curation team and envisions the upcoming exhibitions and activities
- Host of Bildmuseet who serves as the agent between Bildmuseet and its visitors
- Interviewees who were topic-relevant practitioners in the field of art and museum includes:
  - Art pedagogy specialist
  - Exhibition designer
  - Artist

Inspirational questionnaire
> see appendix
An inspirational questionnaire were handed out alongside to students and visitors with more open-ended questions. Text, drawings and oral explanation were encouraged use to communicate ideas. The format gave voice back to the interviewees to express themselves in their favourable medium to communicate their thoughts.
Participants were asked to spend 5 minutes to answer 3 questions about museum identity, participation and community:
- Imagine Bildmuseet (or any art gallery) were a creature/an object, how would it look like?
- If Bildmuseet (or any art gallery) could talk, what would you like to hear about? How would you respond in return?
- Imagine a place where you feel a sense of community, how would it look like?

Conference: Transmediale 16'
In order to get input from other perspectives and think outside of the design box, I travelled to Berlin and joined Transmediale16, a conference that brings art, technology and critical thinking together. The experience proposed several areas that haven't been explored and discussed before.
Secondary research was conducted to look for inspirational projects and related theories. It mainly focused on books and academic papers related to participation theories and practices in art museums, trends in aesthetics and artistic practices.

The best practices collected were mapped out on in two dimensions: the prerequisite knowledge for taking part in the activity (amateur v.s. professional) and the influence the activity generates (private v.s. public). The map was created a discursive piece and was used in expert interviews to understand the preferences and concerns of stakeholders rather than a finalised deliverable in research phase.

> see appendix
Research findings

**Design topic findings**
All information collected in the research phase were transcribed into quotes and mapped out on one canvas to review the relationship and inner logic in between information from different sources.
> see appendix

Those information were clustered into five dimensions:
1. Participation
2. Knowledge
3. Museum identity
4. Physicality
5. Aesthetics

Creations made in creative workshop, Bildmuseet
**Design context findings**

Bildmuseet was investigated as a design context in the project. The aim was to understand the infrastructure, the competence, the speciality and what were the missing values that fulfils both the vision of Bildmuseet and interaction design in the future.

The dimensions defined in design context investigation are universally considered as the key issues that art galleries need to deal with, which means that those parameters should be taken into consideration in ideation, evaluation and concept refinement. Besides it offers a scope of investigation and a thread to group information collected in the research phase.

1. **Aesthetics**

Bildmuseet is positioned as a more gallery type of institution than an art museum. The curation team looks for exhibitions that surprise the visitors with a balance of aesthetics experience and critical thinking. The exhibitions are art not only for the sake of art, but generates discussion towards society and philosophy, and addresses issues that is happening in the world. Young promising artists find their stage set up in Bildmuseet while sometimes it also accommodates world class exhibitions.

2. **Physicality**

Physical space is crucial to Bildmuseet because of the unique visual experience the space facilitates, even though the content of exhibitions can be distributed in various channels. The curation team is interested in digital implementation while still remain the strength of their physical space.

There is a team of hosts in Bildmuseet to translate the message and make exhibitions accessible. They are physically present in the exhibition area to answer questions from the audience. To some extent they soften the “white cube” effect that a culture institute usually imitates its audience and explain the exhibition in a more personal manner.

3. **Interactions with various players**

**Participation**

There is a strong participatory culture in Bildmuseet supported by a range of workshop programs. Visitors can drop by the creative workshop to make handicraft with the help of art educators every weekend afternoons. The theme of the workshop adapts to the topic of current exhibitions. Visitors are suggested to leave their handicraft afterwards to inspire others, which formulates an amateurish hobby exhibition in the area both in relation to the topic of the current exhibition and in contrast to it considering the level of competence.

**Sociability**

Visitors tend to use the space as place to hang out and socialise with friends rather than only consuming the exhibition.

**Collaboration**

The institution is founded by and is one part of Umeå University. This gives access for Bildmuseet to organise cross-over collaborations with other departments of the university depending on the topic of the exhibitions.

4. **Presence**

Public visibility, presence and reputation are crucial to an art museum like Bildmuseet. Visitors return to the space because of the dynamic content of exhibitions around the year. There is no entrance fee for Bildmuseet. The visitors are encouraged to check the exhibitions multiple times.
Design directions

A heat map was visualised from the information map that picked out the connections and conflicts in between quotes from different sources. The most connected areas were translated into design directions. Check out the appendix for how quotes support the design directions.

> See appendix

#1 Amateur aesthetics
How to accommodate lay aesthetics in art museums that might turn professional and mainstream in the future?
The design direction was inspired by an article on <Aperture> on the influence of digitisation over photography. The writer demonstrated the bottom-up movement in art field and "it has certainly put pressure on museums to engage with his work and with street art more generally."[7] The trend doesn’t only attach to the context of art considering the emerging tools available for lay persons to pick up professional practices in other fields such as the maker movement. The creative workshop program in Bildmuseet is a demonstration of this lay practice in the art museum where visitors are encouraged to make handicrafts and leave the creations in the museum to inspire the others.

#2 Collective individualism
How to create an environment that encourages both self reflection and group discussion in art museums?
The design direction came from the observation in primary research that the behaviour of visitors were distinct when left alone or in a group. The conflict was highlighted several times in expert interviews as well. The focus in this direction was the interaction in between visitors, whether the museum could become a place to accommodate this social activity and the question of how to design and evaluate interactions actuated by a collective group of individuals.

#3 Generative archive
How to build on information relevancy for visitors in art museums to get a better understanding of the big picture?
The design direction originated from the way art practitioners explain art to the audience in several expert interviews. They built on information relevancies to related the audience to the artefacts presented in an exhibition. At the same time, there was information hidden from the visitors. Many of them didn’t know some of the exhibitions were world class. The direction aimed to provide visitors with relevant and engaging information that encourages them to understand art from a holistic perspective.
Design principles

#1 Inclusiveness
Participatory projects aren’t just about empowering visitors. Every participatory project has three core stakeholders: the institution, participants, and the audience. The project should reflect the interest of all stakeholders involved in the system. It has to fulfil and align with the institutional mission from the museum perspective. Besides, exhibits that invite self-expression appeal to a tiny percentage of museum audiences.[8] The result has to provide access for both the participants and the audience, consider the different tools of expression they would like and feel comfortable and familiar to use.

#2 Longevity
This principle reflects the need of a gallery type of art museum as Bildmuseet where there is no permanent collection. The final design result needs to address the rotational aspect of exhibitions. This means that it has to be extensive and sustainable to be independent of the exhibition themes.

#3 Presence
The physical space of the museum is still considered as a strength of the public institution. The final result should suggest and open up a new perspective in the help of technology for the museum rather than replacing the experience in the physical space completely. The service should enhance and inherit the strength of physicality by staying visible and distinctive in the museum space.

#4 Diversity
This principle reflects the quality for a complex system design challenge. The nature of the design context includes multiple players and design materials, which requires the final result to be diverse and the interaction will happen in different locations and time to align with the multiple entrances for each stakeholders.
It would appear that the digital world we now live in has rendered participation inevitable. If museums don’t respond, the public will simply find increasingly clever and creative ways to have their say anyway. [6]

03 Ideation

The ideation phase was carried out as a continuous exploration of the design directions defined in the synthesis phase. The goal of this phase was to
- Understand if the design directions are desirable for stakeholders
- Learn and gain deeper insights in the defined directions and get prepared for final concept design
- Evaluate and select one design direction to develop further into the final concept
An ideation workshop was conducted with the education team in Bildmuseet. The goal was to understand their interests, preferences and concern from one of the main stakeholders and, at the same time, having some basic ideas to start with. After being presented the research outcome, the team was asked to brainstorm and sketch out ideas in different time and locations in a prepared visitor's journey map.
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To explore design directions, research probes were made as artefacts to observe the reaction of stakeholders and involve users in the conversation about the proposed design directions. Due to the time constrain, only two rounds of research probes were conducted. Direction “Generative archive” was not included considering the nature of the direction was perceived more as an information design concept rather than service design, and the difficulty to obtain and make sense of real data from the exhibitions within the given period.

Research probes

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Research probe #1
Design direction: Amateur aesthetics

Description
The concept was to design an amateur art exhibition based on the handicrafts made by visitors in creative workshop in Bildmuseet.

Research probe design
Two research probes were included in this exploration: a physical like voter and a digital sharing platform.

The physical like voter was designed as an effortless expression for passive audience in a museum. The probe was put beside some drawings made by participants in the creative workshop to understand the behaviour of this particular type of visitors and if and when they would transform into active contributors given the appropriate access and engagement tools.

The digital sharing platform was handed out for active contributors in the creative workshop as a channel to share their creations. The probe was made as a conversation starter to understand what kind of medium these contributors would like to use for the documentation of both their creative process and the creative result.

Key learnings
The direction is proven desirable for the visitors and the museum, especially when visitors learned about the fact that there is not enough storage space for the handicrafts afterwards, so pieces have to be thrown away. Some of them even resonated on this practicality issue at home. And this could potentially be the motivation for the visitors to document their creations by themselves, so that the data collection effort is distributed and outsourced to the contributors, instead of adding the workload to the museum staff.

1. The intention behind voting is ambiguous
14 visitors hit the like button for a Saturday afternoon. However, the intention of the behaviour was not clear: whether it was because they truly liked the drawings or they just wanted to vote and see the result.

2. Picture is enough for documentation
“My kids are very aware of cameras. They are not behaving naturally in front of them and that's why I will limit the use of videos. Besides, it's too much effort to take a video. I'm here to relax for a weekend with my family,” said one of the contributors who was making things with his kids in the creative workshop when he was offered the possibility to document the experience with pictures, videos, audio clips and written text.

3. Only the result is worth for documentation
The staff in Bildmuseet encourage visitors to enjoy the process of making rather than setting up a high expectation for the result. However, most of the visitors would like to document the result only. Since the creative process is navigated by the museum staff already, the design solution could be something for visitors to preserve the result in a fine resolution.

4. Explain the publication of their creations
One of the issue one visitor brought up during the discussion was he would like to know if the documented piece is public, so he could decide on how to frame the picture. If it's public then he would take a photo without the kids' faces.

5. Visitors are encouraged to leave the pieces in the creative workshop to inspire others
Leaving the analog creation in the creative workshop was seen as a way to contribute to the exhibition.
Research probe #2
Design direction: Collective individualism

Description
This research probe investigated a different program in a museum: a guided tour. Audience usually behaves passive and reserved in a guided tour because of the fear to ask not smart and appropriate questions. However, any question is valuable from the perspective of a tour host. The concept was to design a real time agent to fill in this conversation gap.

Research probe design
The assumption was given a proper communication system, the audience would feel more engaged in the guided tour and the host would be motivated if she receives high ratings. There were two parts in the communication system: multiple sliders for the audience and one light feedback for the host. The audience could use the slider to express their level of interest during a guided tour, and the host would receive a real time light feedback of the message.

Key learnings
1. It's a conversation ice-breaker
When the probes were handed out, the audience started play with them and talk to the host naturally. It was a conversation ice-breaker at the beginning of a guided tour.

2. It doesn't make sense in a smaller guided tour group
Only 4 participants showed up for the guided tour in the experiment. It was already a rather small group and the conversation went well without an agent. They didn't notice much different with the sliders.

3. Audience needs more instructions on how to use the sliders
Audience would like to know when to use the slider in the tour and what they were expressing about. The message was too ambiguous.

4. It's about positive feedback
It’s about giving the positive and exciting feedback only to motivate the host.

5. It feels unnatural to vote for a person in real time
The feedback should be addressed to a neutral and objective issue than a person.

6. Hosts are trained to observe the behaviour of the audience
To read body languages of the audience is part of the professional training of a host. And they were encouraged to be more personal and democratic. This addresses to a bigger discussion where and how much technology could replace human labour.

Evaluation
After this phase, I built up a richer and concrete foundation for the next phase of detail design. For direction <Collective individualism>, an ideal setup for the direction would be a group of more than 10 participants in a guided tour to dissociate with individuals and be anonymous. This unpredictable element was crucial to the result of the experiment. Furthermore, experiments can only be carried out once a week on Sundays guided tour. Given the time constrain, I decided to continue developing the direction <Amateur aesthetics> into my final concept.
[Top] Visitor in Bildmuseet riverside, Bildmuseet

[Right] Transmediale playground
Transmediale, Berlin
The participatory museum is an audience-centered institution that is as relevant, useful, and accessible as a shopping centre or train station. A place where the visitor can construct their own meaning.
Concept description

What if art museums can open up a conversation with the public? What if the voice from the visitors can be heard, hosted and resonated in art museums?

<Open Studio> is a service that enables visitors in art museums to participate in exhibitions with their creations made in the museum workshop. The service opens up a channel for visitors to showcase their participation outcome, increase their enjoyment in the creative process, inspire other visitors and invite them to take part in the workshop programs. The narration around the creations is enhanced by digitalisation in order to fabricate a dynamic expression beyond the static analog artefact, visualise the invisible experiences in physical space and portrait the relevancy in between the artefacts both in the workshop area and the exhibition area. The service also fulfils the role of archiving the participatory outcome for the art museum to trace back and share with other stakeholders: artists, journalists etc in the ecosystem.
**Touchpoint introduction**

**3D booth**
3D booth is where the digital lifecycle of an creation is initialised. It is placed in the workshop space in the art museum. Participants can 3D scan their creations after taking part in the workshop programs, edit the 3D result, contribute their creations to the virtual exhibition and download them to their personal devices.

**Virtual exhibition**
Virtual exhibition is where the result of the participation is displayed. It is placed in the recreation area in the art museum: café, bookshop and etc, with the potential to be implemented to other locations in the city. It introduces the service to the visitors in the art museum, inspires them by showing the collective result of public participation and invites them to take part in the workshop program. The audience can also interact with and edit the result of creations provided that the authorship is left public by the owner of the creation.

**Mobile interface**
The mobile interface is the portal to engage visitors outside of the physical space of the art museum. Participants can claim ownership of their creations, organise and edit their creations in the interface and get noticed if their creations are featured in the virtual exhibition.

**Archive platform**
The archive platform stands at the backend of the service, where staff of the art museum can curate the theme of the virtual exhibition, search for all creations made in the workshop and share the participatory result with other stakeholders in the art industry.
Customer journey

The service introduces two signature touchpoints: the 3D booth and the virtual exhibition. They address two complementary types of visitors in an art museum: the active participator and the passive listener. The 3D booth enhances the creative experience for the active participator who is already familiar and takes part in the workshop programs, while the virtual exhibition intrigues and engages the passive listener in an experimental and playful manner.

The information presented in both of the touchpoints are related to the exhibitions in the art museum. This correlation keeps the visitors in the loop of the service no matter which touchpoint they get introduced first. The visitor’s role in a customer journey is dynamic: the active participator would check the virtual exhibition for their creations while the passive listener would join the workshop program if they are inspired by the virtual exhibition.
The lifecycle of a creation

It was stated in the project brief that nowadays the line between physical and digital artefacts in art museums becomes blurry due to the pervasive adaption of technology. Although rooted from the same piece of information, the experience might be distinct depending on the chosen medium. This is because a different set of components can be perceived or hidden in a certain type of medium.

In many ways could we explore this variation. The project particularly focuses on Time as a classic component to play with in interaction design discipline that draws the line between the physical and the digital. This is especially relevant in an art museum context since artefact would age and some of the properties would respectively change overtime. An example would be the digital restoration of the degraded pigments in Van Gogh’s painting: it’s a time machine that works in both directions[9], to restore the colours when they are originally painted and to peer into the future. Time enriches the narration of a static artefact and the digitisation of it enables the visitors to perceived the hidden dimension embedded in the physical artefact.

The project visualises this dimension by giving a lifecycle to the creation made in workshop programs. Participants can initialise a time capsule to the creation once it is 3D scanned. Some of the properties of the creation would change overtime in the virtual exhibition, which encourages visitors to return to the service in the future. Given the authorship is left public by the owner, other visitors can configure the time capsule to engage with the creation and the service.

Red pigments used by van Gogh in “The Bedroom” have faded with time turning the purple wall blue and the pink floor brown (left). By analyzing the painting’s pigment degradation, conservators at the Van Gogh Museum have produced a digital version of “The Bedroom” as it probably looked when first painted (right).

Credit: Van Gogh Museum
Detail design

**Signature touchpoint 1: 3D booth**
The 3D booth is a physical touchpoint to collect 3D data of the creations once they are completed by participants in workshop programs. There are three main parts in the 3D booth: a turntable, a camera stand and a screen. The 3D booth emphasises a crafting experience that aligns with the workshop program in art museums. The participant is engaged in the action of spinning for a cohesive experience to get involved in the creative process besides receiving the result of creation. The level of automation in 3D booth is lower than some of the off the shelf solutions for 3D scanning in the market in which 3D scanning is done in a obscure box that aims for efficiency rather than experience and engagement.

**Physical interaction design**
A rapid user testing session was conducted to get feedback on product interaction. Two mental models were introduced to investigate how users understand the interaction of a 3D scanning flow and if the experience aligns with the encouraging and playful manner of the workshop program. > see appendix
Digital interaction design

Screen displayed when creation is detected by the scanner.

A preview of the scanned result before dropping the capsule.

Design with time

A rapid user testing was conducted to understand if this is an engaging element for the audience to play with and how to design and visualise the intangibility. Users approved the originality and potential to design for this engagement. However, it turned out that time is an abstract concept to understand, so that the design should be as simple as possible with minimum amount of controls for users, or they might be confused by the amount of information presented.

> see appendix

Participants have the right to keep the ownership of the creation. However, they are encouraged to leave it public so that other visitors can play with the material.

Participants can have a download a copy to their personal devices. The interaction model is inspired by project <THAW> in MIT Media Lab. This technology allows a collocated large display and small handheld devices to seamlessly work together. It enables accurate position tracking of a smartphone placed on or over any screen by displaying a 2D color pattern that is captured using the smartphone’s back-facing camera.[10]
**Signature touchpoint 2: Virtual exhibition**

The virtual exhibition displays the scanned creations as a collection. The surface of the interface is embedded in a touch screen in order to retain the flexibility to showcase the participatory result in various environment and space setup. Visual aesthetics is crucial for the interface of the virtual exhibition considering the interface as an art experience rather than an information carrier.

**Design for audience participation**

When the content is generated by the audience, design considerations move from static solutions to framing the outcome of participation. The main challenge to design for such an interface is to balance the curation aspects and the uncertainty in public participation. This notion is crucial in an art context where the standard and relevancy of the outcome will be evaluated in both in visual aesthetics and critical thinking.

The content in the final interface is taken from the actual creations made in the workshop programs in Bildmuseet in order to learn and experiment with audience-contributed information and get a result as close to reality as possible.

The project considers the following three aspects in particular:
#1 Motivation Of Participation
The service suggests a digital archive as a compensation of insufficient storage space for all the physical creations. 3D scanning is used as a tech-enabled incentive for participation. The service gives audience a voice in the museum by displaying the participation outcome in the museum space.

#2 Content Curation
The virtual exhibition uses the visual aesthetics of 3D scanning to frame the outcome in a coherent collection. The service plays with time as a universal component in all physical creations. This principle is independent of workshop themes and would fit into any objects made.

#3 Service Maintenance
The collection of 3D data is distributed to the participants themselves. The themes of the service are inherited from workshop program to reduce the workload of the museum staff.
Digital interaction design

The main interface of the exhibition displays the creations of the current workshop theme. Visitors can interact with the timeline on the right to explore past themes. The dynamic background patterns underneath hints how popular the current theme is.

Visitors can click to interact with the creations. They can review the past traces of the creation by interacting with the time line of it. The page also displays the related exhibition.
The last step is to share the new version of it. If the creation is getting popular among the visitors, the creation would get special featured for the virtual exhibition. And the creator would receive a notification on her mobile phone as shown below.
Narrative

The concept video explains how the service works in steps with a narration.

Vimeo link: https://vimeo.com/167761306

Storyboard
> see appendix
Exhibition

A website was made for the degree show. The idea was to communicate the project in a concise and precise manner no matter the audience is physical present or not at the degree show. And it would be a continuous touchpoint for the project after thesis. The physical model with core interface interaction was displayed in the exhibition. In general the concept was well-received both in the academic and the public.

website link: http://www.openstudio.io
**Reflections**

**The process**
The degree project was the first and possibly the only chance for me to run a project for such a long time. It offered me a holistic perspective and experience on how a project develops throughout a complete design process. It was very challenging to play every single role in a core design team in turn.

Having a project collaborator significantly contributed to my project. The input from real world offered a solid grounding for me to understand the context and navigated me to a persuasive design result in the end. However, at the same I realised that design context could be learned and interpreted in many different ways, and how to deduct and make sense of the raw material was the task assigned to designers. So the process was very explorative. I didn't follow a user-centered design perspective strictly because I believe users don't know about their desire until the design is presented in front of them. This is especially true when the design work is about proposing a brand new service rather than optimising an existing solution. And this happened and was proven many times in the initial interviews I conducted with visitors in the museum.

When proposing the potential design directions and design principles, I relied heavily on my understanding, interpretation and gut feelings of the design context. I learned to work comfortably with fuzziness and ambiguity. This feeling of unsettlement followed me until I completed the evaluation of my design directions on top of research probes. It was considered as the first milestone of my project.

In order to balance out the elements and ensure they play nicely together in the concept, I jumped between different levels of design fidelities. This means that I divided my work time in small slots throughout the day when several things were under development in parallel. It turned out to be a very beneficial approach since design needs fresh eyes and time away to be perceived objectively. To some extent it also ensured my mental health when working under such a tight schedule and pressure. I felt more confident about the project when I was away for a while and came back with refreshment.

I worked on my own in the project. But I was not alone. I received continuous feedback, critics and support from my tutors, my critical friend and my wonderful peers in the class. My design work became stronger when I explained it and when ideas got echoed and bounced. Looking back at the process, I enjoyed using design as a tool to learn about the things that I had no clue about in the beginning and being able to propose my point of view in the final deliverables. I felt a sense of fulfilment when dealing with complex system design, when I had the opportunity to play with and translate in between different design dimensions, when I could be the designer without any title of discipline.

Given a second chance, I would leave enough time for communication and presenting work in progress concept. This is especially crucial if we consider at least half of design is about communication. I would make sure that I keep the same level of interest and energy throughout the project by looking into other inspirations. And I would plan more buffer for production since I believe design is about details.
**The outcome**
I decided to follow a more provocative path in the detail design phase considering design would only become more grounded not more imaginative in implementation. The final outcome inspires discussions around contemporary and relevant issues in the area of interaction design rather than only proposes a realistic solution. In this sense, the final deliverables stayed till in a conceptual level.

The service and technology would ideally influence and inspire the theme of the workshop programs in a real scenario. The staff would consider planning the types of creations that would fit into 3D scan technology and the curation of the participatory outcome in the virtual exhibition to the best of their knowledge and expertise.

Time is an abstract and complex parameter to be understood and played with. While the direction was proven original, inspiring and promising to design for, the design and visualisation of time in the result was a very first experiment and proposal due to time constrain. I would like to continue developing the experience in a more tangible and engaging direction afterwards.

**The future**
The result was seen as a finished concept design and I would love to figure out the bare minimum, the constrains and adjustment when it is in implementation. I would love to understand and investigate the influence of the concept in a longer period of time: how the audience would react to the project, how kids would interact with the pieces, how the curation of workshop programmes would be influenced, how it would constitute a new dynamic in the physical space, how the project could evolve over time and continuously attract and retain visitors in the art museums etc.
Acknowledgement

I would like to send a big thank you to Madyana Torres de Souza, who was my critical friend and gave me constant feedback and support whenever I was looking for someone to bounce ideas and share my thoughts. Besides, I felt very lucky to be part of the Master of Interaction Design graduates in 2016 in Umeå Institute of Design. Thank you for accompany my journey for the past two years. I learned so much from all of you.

I would like to thank the staff of Bildmuseet, especially the educational team members: Lisa Lundström, Karin Jonsson and Denise Mångsén, who gave me concrete feedback and supported all my research activities in the museum. And all the subjects who I talked to and interviewed with during the project.

And thank you Marlene Kettner, who was my external tutor, also a graduate from Master of Interaction Programme and did her thesis on museum and exhibition design. Your experience, wisdom, kindness and compassion was invaluable for me throughout the entire journey. I was a pleasure to have your great eyes in my project.

A special thank you to Søren Rosenbak, who was my internal tutor and also my friend. It was fabulous every time we had tutoring. It rebooted my energy and made me feel positive about the project. Your knowledge without boundary is fascinating and it opens new perspective and directions for me. Thank you so much.
Reference


Inspirational questionnaire

Selected

1. Imagine BLMuseum (or any art gallery) were a creature/animal object, how would it look like?
   
2. If BLMuseum (or any art gallery) could talk, what would you like to hear about?
   How would you respond in return?
   
3. Imagine a place where you felt a sense of community, how would it look like?

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Design directions
With key quotes and findings

Amateur aesthetics
How to accommodate lay aesthetics in art museums that might turn professional and mainstream in the future?

With street art you’ve seen some of that pressure being applied in quite interesting ways. Take Banksy, who deliberately operates outside the art market and whose art seems very simple, uninsured by sophisticated conceptual devices, and parasitic on advertising yet he seems to have some of the good things about him. It’s like the art world. It has certainly put pressure on museums to engage with his work and with street art more generally.

-<The canon after internet>

We always ask people to leave their pieces here in the workshop.

-Denise, art educator of Bildmuseet

A visitor proudly showing off their piece in the workshop.

#Field research

Collective individualism
How to create an environment that encourages both self reflection and group discussion in art museums?

Usually parents just stay beside watching kids playing in the workshop.

-Arna, workshop host

When visitors are in a large group, they tend to be more passive, not interacting with the pieces. However, when they are in a smaller group, they find more comfortable to touch and look closely at the show.

-Arne, host of Bildmuseet

The exhibition area in workshop.

#Field research

Generative archive
How to build on information relevance for visitors in art museums to get a better understanding of the big picture?

The idea is everything connects together. We look for relevance when we explain things.

-Kari, host of Bildmuseet

One of the visitors responded: "My dad had one of these flashlights before.

-Kari, host of Bildmuseet

The topics we have here link back to what’s happening in the world. It’s about politics, society and philosophy. It’s about everything.

-Katarina, director of Bildmuseet

Many visitors don’t realise that there’s world class exhibitions going on here. And they are all free.

-Denise, art educator of Bildmuseet

How would you explain this event?

-I want it to be truth behind the big picture, not only about something, but why it happens. After that, we will need to explain the details with big ideas.

Then, I should ask why not start explaining.

-Kari, host of Bildmuseet
The 3D scanner
The screen
In this mental model, all 3D scanning related instructions were displayed on the screen aside. The action of spinning and the instruction of spinning had separate embodiment. Users were confused and didn't understand how to use the 3D scan.

The dial
Light were embedded as feedback in the scanning process on the spinning table in this mental model to indicate the action at the place it happens. The design of the spinning table referred the dials on an old-fashioned telephone to hint the spinning behaviour with precision. The interaction model with light feedback was easy to understand. The reference of a dial added to the playfulness and design quality of the product.
Testimonial implementation

Simple control
time to control both parameters: colour and texture

Understanding what is changed
realtime outcome feedback

visualisation of pigment degradation curve
Flow chart
Work in progress

Virtual exhibition flow

Timeline and exhibition theme
  Flip through time
  New set of creations

Creations in chronological order (private, public, featured, time and theme overlapped)
  Tap a creation
    Creation detail view
      Exhibition name, time
      Owner (if available)
      Modify (if public)
      #Other related creations
      #Display creation
    Creation modify view
      Properties to modify
        Reset
        Finish
      #Display creation
        If creation gets popular & owner registered
          Notify owner

Service introduction
  Ongoing exhibition in museum (secondary, hidden)
  Tap another creation
Login / Register

App flow

Exhibition archive

- Flip through time

New set of creations

My creations

- #List view
- Tap a creation

Service introduction

- Ongoing exhibition in museum (secondary, hidden)

Creation detail view

- Exhibition name, time
- Modify
- See public creations (if available)
  - #Display creation

Creation modify view

- Properties to modify
  - Reset
  - Finish

#Display creation
I'm Irene. I love checking out galleries for inspiration and contemplation in my spare time. It makes me feel like back in kindergarten again.

Everything is beyond expectation in an art museum. So here it is, a dragonfly? Anyway, artists are crazy.

They said it's made in Open Studio.

It's public so everyone can contribute to this exhibition.
The host told me I can make things here and my creation can be part of the exhibition. Here, you are almost an artist now.

3D scanner? Never tried before. But at least it doesn’t seem like a big challenge.

Scanning completed!

Let’s just put it up on the wall.

I’m fine giving access to the public. It’s always interesting to see what others come up with. I’m a pretty democratic artist.
Of course not.

LIFESPAN
13 weeks or 15.6 months old

NEW CREATION
SHURE

Maybe I should go there with my friends next week.