Engaging visitors through exhibition design

Elisa Luoto
Master’s Thesis
Aalto University
Elisa Luoto
Engaging visitors through exhibition design

Master´s Thesis
1.5.2018

Aalto University
School of Art, Design and Architecture
Department of Design
MA Programme in Product and Spatial Design

Supervisor Pentti Kareoja
Advisor Marco Rodriguez
<table>
<thead>
<tr>
<th>CONTENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BACKGROUND</td>
<td>6</td>
</tr>
<tr>
<td>2. CONTENT OF THE THESIS</td>
<td>8</td>
</tr>
<tr>
<td>2.1 Research questions</td>
<td>8</td>
</tr>
<tr>
<td>2.2 Defining the thesis</td>
<td>9</td>
</tr>
<tr>
<td>2.3 Process and methods</td>
<td>9</td>
</tr>
<tr>
<td>3. RESEARCH</td>
<td>10</td>
</tr>
<tr>
<td>3.1 Exhibition design, past and present</td>
<td>10</td>
</tr>
<tr>
<td>3.2 Exhibition design elements</td>
<td>13</td>
</tr>
<tr>
<td>3.3 Engaging visitors</td>
<td>15</td>
</tr>
<tr>
<td>3.4 Engaging visitors in exhibition</td>
<td>17</td>
</tr>
<tr>
<td>3.5 Exhibition designer and visitors</td>
<td>19</td>
</tr>
<tr>
<td>3.6 Display methods</td>
<td>21</td>
</tr>
<tr>
<td>3.7 Conclusion</td>
<td>23</td>
</tr>
<tr>
<td>4. CASE STUDY: Evolution of Computers exhibition</td>
<td>24</td>
</tr>
<tr>
<td>4.1 Description of the assignment</td>
<td>24</td>
</tr>
<tr>
<td>4.2 Exhibition space</td>
<td>25</td>
</tr>
<tr>
<td>4.3 Exhibition visits</td>
<td>28</td>
</tr>
<tr>
<td>4.4 Description of the process</td>
<td>32</td>
</tr>
<tr>
<td>4.5 Inventory and curating</td>
<td>35</td>
</tr>
<tr>
<td>4.6 Preliminary concept</td>
<td>36</td>
</tr>
<tr>
<td>4.7 Workshop</td>
<td>37</td>
</tr>
<tr>
<td>4.8 Concept</td>
<td>53</td>
</tr>
<tr>
<td>4.9 Final design</td>
<td>56</td>
</tr>
<tr>
<td>4.9.1 Lounge furniture design</td>
<td>56</td>
</tr>
<tr>
<td>4.9.2 Exhibition design</td>
<td>64</td>
</tr>
<tr>
<td>4.10 Implementation</td>
<td>72</td>
</tr>
<tr>
<td>4.11 Opening event</td>
<td>76</td>
</tr>
<tr>
<td>5. CONCLUSIONS</td>
<td>80</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>83</td>
</tr>
</tbody>
</table>
This thesis is about engaging visitors through exhibition design. The thesis consists of two parts; the first part is a research and the second part is a case study. Firstly, in the research part I examine the topic of engaging visitors in exhibitions and highlight the role of the exhibition designer. I also discuss the fields of exhibitions and exhibition design in general. Additionally, I research the importance of experience, interaction and storytelling in exhibition design context.

Secondly, the case study focuses on how to engage exhibition visitors in IT environment. The case study is an exhibition design project for the Department of Computer Science at Aalto University. The exhibition design was a collaboration project between my own Department of Design and the Department of Computer Science. The project assignment that I received, was to design a permanent museum exhibition. The idea was to display old computers and devices which were at that time hidden in the storage. The end result of the project was the design and the implementation of *Evolution of Computers* exhibition.

Through this project I want to examine how to engage visitors and how to display and transmit information through experience. The aim of the study is to find out how exhibition design, information display media and interaction effects on the experience of exhibition visits.

I chose the topic of exhibition design according to my personal interest and experience. I focus on how to engage visitors, because the main purpose of exhibitions is to influence visitors, to raise ideas and imagination. An exhibition has no meaning without the audience.

Keywords:
exhibition design, interior design, engaging, visitor, museum, experience, interaction
I chose exhibition design as the topic of my Master’s Thesis, because I have always been interested in exhibitions and displaying whether concerning art, design or trade. My own background and experience in exhibition design has encouraged me to develop my skills and understanding further. Throughout my studies at Aalto University, both in BA Interior Architecture and Furniture Design and MA Product and Spatial Design, I have had the chance to take part in organizing exhibitions. My BA class organized independently furniture and lighting exhibitions in Helsinki such as; Exhibition Aluminum furniture at Klaus K in 2011, Lighting Exhibition LEDS at +Studio in 2012 and Exhibition Taipuu at Isku Showroom in 2013. Through these exhibitions I have gained good experience, because we students were responsible for organizing the exhibitions including graphic and display design, implementation, transportation, contacting cooperation partners and organizing the opening events. In fact, also my Bachelor’s Thesis included a gallery exhibition design. The office and gallery design was made for an art consulting company Pink Eminence Oy.

Moreover, during my MA studies I got experience in management while I was leading an exhibition design project in Annantalo. I was leading a group of Aalto University students (6) both from the School of Art, Design and Architecture and the School of Chemical Engineering. We designed and implemented a spatial installation called Mökki which was part of Japanese contemporary art exhibition *Folding cosmos Helsinki in 2015 (Fig 1.). This project got me even more interested in exhibition design and installations. Additionally, I took part in two other exhibition design courses. For Theatre Museum my group designed an exhibition with the theme of Love and for exhibition centre Weegee my group designed an interactive spatial installation.

After this I wanted to organize furniture exhibitions individually with my colleague Heidi M. Huovinen. In year 2015 we founded our own furniture brand HE Design Helsinki ( hedesignhki.com ) and in 2016-17 we participated in international design fairs in New York, London and Helsinki where we got selected among other young designers. During these fairs we gained experience of organizing, managing and implementing exhibitions also abroad which requires comprehensive management, budgeting and scheduling. In order to implement these events, we luckily received grants.
As I describe above, exhibition design has been part of my studies and work since 2011. In this Master’s Thesis I familiarize myself even deeper with exhibition design, the role of the designer and the design process concerning exhibition design for a client. In the thesis project I have developed my skills and understanding further as an exhibition designer. To be honest, in this project I got involved with a completely new and unfamiliar topic; tech and history of computers. However, I got excited about the exhibition design project, because I wanted to challenge myself to design something interesting of old computers. This topic might not be the most exciting as a starting point unless you are familiar with IT and computers which I was not. Throughout my studies and exhibitions, I have realized the importance of engaging visitors, and that is why, I have determined to highlight this topic in my thesis. I have also learned to focus on experience, understandability and storytelling in exhibition design. I think the aim of exhibitions is to communicate and transmit information from the artist/designer/company to the visitor.
This thesis is a two-part study combining theoretical research and field study. The thesis focuses on the case study that is a comprehensive project combining design and implementation. The project part describes an exhibition design task which was requested and assigned to me. The case study was an exhibition design project for the Department of Computer Science at Aalto University in 2016-2017. The exhibition design was a collaboration project between my own Department of Design and the Department of Computer Science. The case study focuses on how to engage exhibition visitors in IT environment. The project assignment was to design a museum exhibition. The idea was to display old computers and devices which were at that time hidden in the storage. The end result of the project was the design and the implementation of *Evo-lution of Computers* exhibition.

Despite the importance of the project, the thesis contains research on exhibition design and analysis of exhibitions. Due to focusing on the project, the theoretical research is concise and limited to only scratch the surface of the intriguing topic of engaging visitors in exhibition design. The focus of the thesis is on engaging visitors through experience whether concerning the case study or the research. The aim is to survey the field of exhibition design, the key participants and most crucial aspects concerning engaging visitors. Moreover, I pursue to solve which components and perspectives the designer must take into account while designing an exhibition.

### 2.1 Research questions

Research questions are focusing on the role of the designer and visitors. The most important aspect is how to design an interesting exhibition which would engage visitors. While discussing the role of the designer, there is a need to consider other parties that are involved in exhibition design.

The main research questions are the following:

1. What is the role of the exhibition designer in exhibition design?
2. How to engage visitors through exhibition design?
3. How to design an exhibition which is interesting, engaging and lively?
One can approach exhibition design from many angles and perspectives. In this thesis I focus on the designer’s point of view, which other parties are related to exhibition and how to engage visitors through exhibition design. The main focus is on the designer’s role in the process and how to design an exhibition that would resonate with the audience. The designer’s role differs depending on the purpose of the exhibition, whether it is about art, trade or technology.

The core question regarding the case study is; am I able to create an interesting, engaging and interactive museum exhibition. My aim is to have at least some of the devices operating in order visitors to try and use them. In this case the exhibition would not only be about watching these old museum items from the distant, but rather to take part in the exhibition by testing old interfaces, programs and potentially to play some of the old games. Through this, one might experience nostalgia. Young generations might learn how the computers use to be and how they have evolved through time from desktop to laptop, from picture tube to flat screen etc. The goal is to avoid dusty, boring museum atmosphere and to inspire and to get visitors involved in the exhibition.

Firstly, I survey the field of exhibition design and the role of the designer in exhibition projects. This theoretical research is based on literature and is also supported by reflections from my exhibition design experience. Secondly, I got acquainted with exhibition design by visiting exhibitions. To benchmark exhibitions for the design project I visited Museum of Technology in Helsinki and Helsinki Computer and Game Console Museum in Verkkokauppa. To broaden my understanding I also visited art exhibitions Olafur Eliasson exhibition in Moderna Museet in Stockholm, Yayoi Kusama: In Infinity exhibition in HAM Helsinki Art Museum and EMMA Espoo Museum of Modern Art. These exhibition visits gave me the insight to the theme of engaging visitors.

Thirdly, in the case study I had a unique possibility to examine the process of exhibition design from the very beginning to the end. In this project I consider myself lucky to gain the experience of a tangible project with practical limitations such as space, budget and time. I describe and express the process and analysis of the project with text, diagrams and visual material. The aim is that research, exhibition visits and the case study will support each other and this is why I have carried out these tasks simultaneously.
3. RESEARCH

3.1 Exhibition design, past and present

In this chapter we discuss briefly about exhibitions in the history and at the present. According to Locker (2011) exhibitions are organized in many different scales from small size table exhibitions to huge size events that are taking space of many hectare meters. Because of this, it is important to define what size and what kind of exhibition is in question for example while comparing and analysing exhibitions. The biggest exhibitions are world expositions that may cover entire cities and surrounding areas. Even nowadays, the internationally known term EXPO originates from the French word exposition from the first world exposition in Paris and the word obviously means exhibition in French. World Expositions are held every fifth year and at the present time there are more and more business involved. (Locker 2011, 10-12.)

According to Bureau International des Expositions (2018), that is taking responsibility of sanctioning of the World Expos, the big size exhibitions World Expos have been organized since the first world Expositions in London 1851 (Fig 2.) and in Paris in 1855. The latest World Expositions were Expo 2015 Milano and Expo 2010 Shanghai, the next will be Expo 2020 Dubai.

In addition to traditional World Expos, museums are the other historical example of exhibitions. Whereas Expos may be temporary, museums are systematically designed to last. According to Locker (2011) museums are exhibiting mainly historical items and artworks which belong to the each museum own collections. Along with permanent exhibitions, museums are frequently organizing temporary exhibitions that are alternating. Generally, art museums keep a separate space for altering exhibitions and other space for permanent exhibitions. However, the most important task for museums is to preserve valuable historical items and showpieces unharmed to the next generations, which differs museums from other forms of exhibiting. Besides, regarding museum exhibitions there is a need for so called invisible storage and separate spaces for maintenance and transportation, because of many different collections. The preservation of old pieces is not simple because of the requirements of conditions are high regarding such as temperature, light and humidity. Traditionally, museum showpieces are not allowed to be touched in order them to preserve. (Locker 2011, 25.)
Lorenc (2010) suggests that present exhibitions are developing into the direction of emphasizing cooperation where the idea is to balance space, exhibits and communication between each other. Thanks to technological development there are nowadays many means of exhibiting with the help of present media such as video, light and sound. Exhibition design is constructed with several fields of specialization which can together create a successful ensemble. Exhibition design is a combination of areas of several professional skills for example architecture, interior design and graphic design. In addition, exhibition design includes design and implementation skills of digital media, construction, light and sound. (Lorenc 2010, 6-8.)
Furthermore, Bertron (2006) reminds that exhibition design includes many fields of expertise beside exhibition designer’s profession itself. For example, museum exhibitions cooperation partners might be curators, researchers, museum professionals and conservators. Whether it is a permanent exhibition or a short term, travelling exhibition, in each case contribution of several professionals is needed. In other words, exhibition organizing is a process that requires cooperation between different fields of expertise and this is why teamwork matters. Additionally, exhibitions play an important role socially and educationally. Many times, museums and exhibitions are supported by governments or other official organizations. In these occasions exhibitions might make an significant effect even internationally. (Bertron 2006, 7-8)

3.3 Exhibition design elements

For the sake of creating a successful exhibition, it is advisable to invest time and money in displaying and lighting in order to show and highlight the exhibiting objects in the right and advantageous way. Thompson (1994) claims that even the most outstanding and exceptional exhibiting objects may appear boring, uninteresting or unsuccessful in case there is not enough effort, investment and focus while designing the exhibition. Especially lighting makes a fundamental difference because light brings all things visible. Lighting leads the eye where to look at, encourages to move forward and effects for example on atmosphere and focus. It is recommended to showcase the exhibition and the content in the right light, so to speak, in order to transmit the exhibition idea and message to the audience. (Thompson 1994, 4.)

Along with technical matters, the most crucial element to consider is the target group. The purpose of exhibitions is to showcase and to effect on people, the audience. Therefore, to whom the exhibition is designed for reveals the main question. The design guidelines should focus on the audience, how to reach and engage visitors within the target group. The task for the exhibition designer is to estimate what kind of physical limitations and needs the visitors may have. It is also beneficial to recognize what kind of intellectual and emotional needs and abilities the visitors may have so that the exhibition experience would turn out to be as influential, delightful and fascinating as possible. Generally speaking, it would be ideal if the exhibition would engage everybody despite the age, background or education. Nevertheless, considering most of the cases it is unlikely to achieve this goal because people are influenced in different ways. (Locker 2011, 34.)

Above all, the age of the visitors impacts the exhibition design remarkably. As far as I can see, children as visitors differ from adults as visitors and also children with different ages differ between themselves. First of all, while designing for children physical and intellectual qualities must take into consideration not to mention children’s behaviour and objects of interest. Usually public exhibitions are designed for all age groups and also for special groups such as disabled persons. In which case it is challenging to design and implement an experience that would resonate and engage all visitors.
Exhibition design includes many different phases, which can be developed through feedback and evaluation. Locker (2011) divides exhibition design process into six phases. The first phases are analysis and ideation that are followed by development phase and presentation of the proposal. After this comes the detail design and finally the exhibition is installed and implemented. Circles in the following diagram (Fig 4.) describe the development and the amount of information is in each process phase. The information is regarding client, organization, location, exhibition theme and storyline. Rectangles represent dialogue between audience and exhibition space. In the beginning the focus is on analysis, design and most importantly the role of the audience increases towards the end of the project. (Locker 2011, 36-37).

![Diagram showing exhibition design process, six phases by Locker.](Fig 4. Exhibition design process, six phases by Locker. (Locker 2011, 36).)
3.4 Engaging visitors

As far as I am concerned, appealing exhibition design aims to engage visitors through experience. Visitors’ motivation and engagement are the essential focus points for the designer to take into account. This is because visitors are not easily seduced to pay attention and especially not to participate in exhibitions. In general, there is a lot of literature about exhibition design from big world exhibitions to small gallery display but not many publications are focusing on the experiential perspective in the exhibition design. Therefore, I insist to highlight the importance of the experience and the role of the designer in exhibition design.

In this chapter I firstly examine what are the different display medias that are playing an important role in engaging visitors. Secondly, I focus on how an exhibition can transmit information to visitors through experience. In other words, this chapter questions how visitors are attracted to engage themselves to follow the exhibition and to take part in it. Moreover, I research on visitor exhibition experience depending on the information display media such as traditional text or more stimulating format, like a video. I discuss the topic from spatial designer’s point of view by the experience that I have gained in my profession.
My aim is to raise thoughts concerning exhibition design and visitor experience by describing the influence of different display media in exhibition design. In addition, I question the role of the exhibition designer, and on the contrary, what is the role of the artist himself/herself and the message of the artistic work in the exhibition design.

Fig 6. Olafur Eliasson exhibition at Moderna Museet in Stockholm.
3.5 Engaging visitors in exhibition

The engagement of visitors concerning exhibition design embodies many aspects and it consists of various parts that needs to take into consideration. According to my learning and professional experience, there are two ways of engaging visitors in the exhibition design. The first way refers to the purpose of the exhibition itself and the second to the role of the display design.

As Velarde (1988) describes, the exhibition designer should bear in mind that the purpose of an exhibition is about not only enlightening visitors but also entertaining them. This is in order to create an engaging experience and to give a knowledge-based visit that might in the worst case be sterile and tiresome. Moreover, when considering the purpose of the exhibition whose embodiments are design and visuals, they should neither overpower the message of the exhibition nor override artist’s vision and intention. The exhibition design should strengthen the artistic work as well as the story behind everything by bringing the professional added value of a spatial designer to the existing work (Velarde 1988, 9). In other words, the biggest challenge for the exhibition designer is to transmit the artistic work both in a subtle and expressive way in order to create a comprehensive experience that highlights the meaning of the display content, whereas not to cover the core idea with pretentious spatial design spectacle.

The other way of engaging visitors lay in the exhibition designer’s hands. Designer’s task is to translate abstract visions and ambitions into concrete and understandable spatial design. Exhibition design is about transmitting information to the visitor through spatial experience, it is about communication. It is important to build design that is both communicatively impressive and visually influential.

As Viction:ary (2007) describes, exhibition design aims to make permanent impact on visitors by enhancing spatial features to create a strong experience. The exhibition design focuses on generating powerful relationships between visitors and display content (Viction:ary 2007, S 004-005). By succeeding to create that connection it will continue to resonate in the memory of the visitor because experiential exhibition visit will linger on and will be processed further in the mind of the visitor even after the event.
According to Victionary (2007) one essential method to help exhibition designer in translating abstract visions and ambitions into a concrete spatial design, is to ingeniously incorporate visual graphics in the exhibition space. This is because graphic design has the task of storytelling to make the content understandable for the visitor. Graphical elements are the eye catchers. Advertisement both outside and inside the exhibition influence visitor’s idea, understanding and experience of the exhibition (Victionary 2007, A 004-005).

These graphics affect visitors’ interest and engagement. In order to get a better understanding of the phenomena it is essential to understand that visual elements have the role of generating coherence and reflecting the core idea of the entire exhibition. Furthermore, graphics serve as affiliation instruments from display subjects to the public. The graphics serve as signs and instructions for the visitor to read and go through the exhibition as the designer has intended. Therefore, the signage and the visuals are vital and most of the cases even necessary for enlighten the meaning and the route of the exhibition.

Fig 7. Engaging sculpture at EMMA, Espoo Museum of Modern Art.
3.6 Exhibition designer and visitors

The exhibition designer Kossmann (2010) considers that exhibitions are about people, encounters and movement. For him, this movement signifies the movement of both mind and body at which the visitor comes a part of the exhibition on the contrary of being merely an external observer. The exhibition comes to life and is evolved by the visitor’s imagination. To engage the visitor to take part in the exhibition happens in respect of the exhibition, content, architecture, space and other visitors so that the exhibition becomes the actual art piece itself in which the visitors are taking part. Successful exhibition makes an indelible impression to the visitor, which is the biggest challenge for the designer to achieve because it is needed to evoke the visitor’s interest to take part in the exhibition. Whereas, in the areas of art that are based on performance such as theater and music concerts, contact with the audience is much more direct and obvious. At that time the visitor is observing some activity that easily catches the attention. Due to this, also exhibition visitors ought to be persuaded to look closely, experience and immerse oneself in the story of the exhibition. (Kossmann 2010, 8-10.)

Exhibition design is about producing experience, evoking thoughts and feelings through the visitor’s participation. The experiences are arisen between the exhibiting objects and the visitors in real time. Visitors’ background and former experiences in life influence in the experiences that are produced by the exhibition visit. One can compare the role of the exhibition designer to the role of a composer, a conductor or a choreographer. Alike them, the designer’s task is to create a compelling exhibition experience for the audience. Luckily, human tend to observe carefully the environment around him/her. This is why exhibitions work as an information channel which humans can naturally embrace which is an encouraging starting point for the exhibition designer to create visual, three-dimensional representations. (Lorenc 2010, 8.)

One should remember that exhibitions are always designed for people, although in reality the artist or the content might be considered to be the main concern and focus. Only through the visitors’ new ideas and interpretations can originate and without visitors the exhibition will turn out pointless and waste of energy.
The meaning of exhibitions is not alone showcasing objects but rather to activate interaction between the exhibition storyline and the visitor. Figuratively, the dialogue between the exhibition and the visitor is meant to generate movement inside the viewer through external movement. It is also about the interaction between other visitors with whom the experiences are shared, although it might be unconsciously done. While designing exhibition, it is essential to approach the subject from the visitor’s point of view. Placing of the exhibiting objects, paths and lighting influence the shape and the atmosphere of the space the most. All the technical solutions impact on how the information is transmitted and how comprehensive and impressive the exhibition will turn out to be.

Fig 8. Engaging installation by Yayoi Kusama, In Infinity exhibition at HAM, Helsinki art museum.
3.7 Display methods

In this chapter I examine how different ways of communication effect the exhibition experience. These ways of transforming information are for instance text, visuals, sound and video. Traditionally, text has served as the core material for illustrating and telling a story in exhibitions. Nowadays, graphics and visuals along with the text are on the focus point of the exhibition. Here I glance at other methods of displaying information by claiming that other senses should not be ignored. For instance, in addition to visual communication, audio can be taken into consideration. On the other hand, other senses like sense of touch, smell and taste are hard to enhance in exhibition environment but they should not be entirely left out. The most powerful way of influencing visitors is to design an experiential space that includes all the forms of communication. This experiential impact can be achieved through storytelling that evokes all senses by seeing, hearing, tasting, smelling, touching and feeling (Show 2012, 5).

Regardless of the different attributes and methods, the aim of the exhibition is to create an influential experience by a comprehensive and engaging display implementation. The focus is to design and implement a spatial experience where participants have a chance to look into another reality by stepping inside a narrative path and letting oneself to be transported from this space to another world (Kramer 2014). Within such an implementation, visuals are at the center point while telling a story. Consequently, exhibition design should be perceived as a narrative space in which the magnet parts are powerful graphical elements. By the aid of design the aim is to create an interaction between the display subject and the space, but it should be all about the interaction between the visitor and the exhibition (Victina:ry 2007, A 004).

Traditionally, display objects are introduced with descriptive texts that are situated right next to the objects. In most cases these texts are written with a relatively small font size, which can make reading difficult and uncomfortable. These excessively small letters can cause visitors to move back and forth and this is most irritating in an overcrowded room (Velarde 1988). If visitors are in a relatively big exhibition, this way of information presentation can be tiresome and highly time consuming. In the end of the exhibition visitors might no longer read any descriptions.
According to Velarde (1988) exhibition design is all about catching visitors’ attention regardless of whether it is about displaying to inform, sell, persuade or delight. Around 1970s onwards it has been realized that museums can be places of fun and excitement. An even newer idea is that visitors can take part in the exhibition and interact with display pieces not only admire them from a distant. However, a fact is that museum exhibitions, both permanent and temporary, require security and conservation. (Velarde 1988, 14, 30.)

Requirements of security and conservation makes it more challenging to make museum exhibitions interactive. In a perfect circumstance, the author of the exhibition achieves to communicate directly with the visitor by creating a convenient experience with which the visitor can identify himself/herself. This is not an easy task, because museums have to reach all different types of visitors and therefore they have to find ways to use clever methods to tell a story.

Fig 9. Painting by Yayoi Kusama size 3 x 3m, In Infinity exhibition at HAM, Helsinki art museum.
3.8 Conclusion

In summary, exhibition designer’s task is to persuade visitors to engage themselves in an exhibition. It is all about attracting and getting visitors attention. This challenge of engaging visitors is due to human indifference and laziness. In order to get people excited and interested, exhibition designer have to take both visual and spatial elements and storytelling into consideration to create a coherent and effective experience.

Moreover, the purpose of exhibition is to communicate and transfer the core meaning of the content to the visitor and that is the task of the exhibition designer. The most powerful way to do this is to make the exhibition visit a comprehensive and engaging experience, which the visitor will remember and process further also after the visit.
4. CASE STUDY: Evolution of Computers exhibition

4.1 Description of the assignment

The first idea of the exhibition came from Aalto University’s Museum Coordinator Anne Vähätalo who suggested that the Department of Computer Science might create their own museum exhibition because the idea of one Aalto museum was declined. After this, the exhibition project was offered to Aalto Art Coordinator Päivi Kiuru and after a while she suggested the project for the Department of Design. It was resolved that the project would probably be too small for group projects so my teacher and thesis advisor Marco Rodriguez suggested the project to me. This was because I had told him that it had a wish do my thesis about exhibition design and that I was looking for a real thesis project.

The aim of this permanent exhibition is to show an interesting and engaging but concise overview of the history of IT and computers from 1970-2010. The exhibition tells a story of technical evolution and development through IT devices and computers. The project contained inventory of the old devices in the department, curating of the exhibition artifacts and project management such as budget, bidding, schedule and communication between all the participants. In addition, the project contained spatial design for the entire space where the exhibition is located. For the exhibition I designed custom made stands and vitrines and for the surrounding space I designed furniture and lighting according to the agreements of ACRE Aalto University Campus and Real Estate.

Fig 10. Diagram 01 Main elements in this exhibition project.
4.2 Exhibition space

Project location:
Aalto University, School of Science,
Department of Computer Science
T-talo in Otaniemi, Konemiehentie 2, Espoo, Finland
Designed by architecture office Brunow & Maunula.

The exhibition space is on the 2nd floor “terrace” and it is located in the middle of the building where there is an inner atrium space. The location can be seen from every direction inside the atrium and from the office windows which are directed to the atrium.

Fig 11. T-talo building, the entrance.

Fig 12. Inside T-talo. Red dot marks the exhibition space.
The 2nd floor terrace space is planned to include exhibition and leisure area where the staff can gather and socialize. The terrace can also serve as a working space. The space size is 74 m². Before the changes there were tables, chairs and shelves in the space and especially students were using the space for group working. The space is a bit dark because the 3rd floor terrace is right above it.

There is some general lighting, but still the space feels rather dark. Actually, the dark space can be beneficial for the exhibition, because the exhibiting items might stand out better with spotlights. Also, the idea of having computers in operation works well when there is not too much sunlight so the screens can be seen better.

Fig 13. T-talo 2nd floor drawing, red rectangle marks the exhibition space.

Fig 14. The exhibition space is below the 3rd floor terrace.
Materials and elements of the space:

- Metal rail, dark grey
- Concrete, light grey
- Fixed plastic carpet, turquoise
- Metal pipes, dark grey
- White walls
- Red tile walls

Fig 15. 2nd floor terrace, the exhibition space.

Fig 16. View from the 1st floor, red dot marks the exhibition space.

Fig 17. Red tile walls.
4.3 Exhibition visits

To benchmark exhibitions related to Computer Science I have visited The Museum of Technology in Helsinki and Helsinki Computer and Game Console Museum. As far as I was able to find out, these are the only exhibitions regarding the topic in Helsinki.

Visit to The Museum of Technology

The Museum of Technology is located in Helsinki, in Vanhakaupunki. There are plenty of material and information gathered about technological history. There is a fee for the museum visit. I visited this museum in autumn 2015. I was especially interested in computers since the staff in the Department of Computer Science suggested me to visit this museum to see the first computers. Above all, they wanted me to see Esko that is the oldest computer build in Finland in the 1940s. Despite my eagerness to see Esko, I was disappointed with the computer section in the museum. To be frank, it was dull, uninspiring and unengaging. There were laminated and unclean description signs next to the items and none of the computers were working so that visitors could use them and to participate in the exhibition. After this visit, for a short moment I felt unencouraged of designing computer exhibition. But in fact, the visit was eye opening and I realised even clearer how important it was to create something inspiring and engaging for visitors. I was determined to have at least one or two computers operating in my upcoming exhibition.

Fig 18. Esko, the first computer build in Finland.
Fig 19-20. Reflac 1960s, build in Helsinki Technical University, today Aalto University, the Department of Computer Science (the client).

Fig 21-22. Computers from the 1980s, description signs were laminated and located in table corners.
Visit to Helsinki Computer and Game Console Museum

Helsinki Computer and Game Console Museum is located in the same building with Verkkokauppa in Jätkäsaari. I visited the museum in autumn 2016 when I heard that this museum exists. The exhibition is free of charge and is open during opening hours of Verkkokauppa. The exhibition is located in an elevator lobby and the exhibition space is rather small.

Vitrines were situated along the walls and three of them were standing in the middle. Exhibits were computers, consoles and additional items such as joysticks. Every item had its own info sign describing general facts of each item. Game consoles Playstation 2 and Game Boy Advance by Nintendo were free to touch but unfortunately, they were not working during my visit.

Surprisingly, there were three big size game figures next to the right wall that was a funny detail. In over all, the exhibition and the presentation of the items was okay and at least the info signs were clear. But in reality, the experience was rather dull and conventional to engage me. I would have hoped to test the games and there might have been a video or a timeline illustrating the development of games.

Fig 23-24. Helsinki Computer and Game Console museum, logo and space.
Fig 25-28. Playstation 2 and Game boy were not working during my visit. Big game figures were surprising.
4.4 Description of the process

The process of the project transformed a lot within time. There were some big changes happening in the department during years 2016-17. In year 2017 other departments of Aalto moved in T-talo building so that the amount of staff, researchers and students increased significantly. For example coffee rooms and offices were entirely renewed by ACRE, Aalto University Campus and Real Estate. The exhibition design was obviously combined with these comprehensive renewals in T-talo. These changes brought new challenges, situations and people in the project. In fact, the Head of the Department changed three times during the exhibition project. The decision making concerning especially the exhibition design budget was difficult, because only the Head of the Department made these decisions and most of the time the process did not proceed because of this. I think the biggest challenge of the project was that there was no clear aim and no clear budget. These two important aspects made curating and designing challenging and postponed every phase significantly.

The other difficulty was that there was no particular contact person with whom I could have clarified how the project would proceed; the aims, the space, the budget, the schedule etc. In other words, there were many people with whom I negotiated and planned the project. If there were one contact person it had made the process much clearer, faster and efficient. On the other hand, it was fruitful to get many professional points of view from many members of the department.

Inventory and curating was on my responsibility and because I had no professional understanding of IT this task was difficult and long lasting. There were no external curator so it was me, the designer, who decided which devices and items to be displayed in the exhibition. Only with the help of the staff I was able to produce inventory and to gather information that was required to curate the items. I organized a workshop to gather information and opinions of the devices. In order to get more info of the devices from the 60s and 70s I interviewed two Emeritus professors, Academian Teuvo Kohonen and Olli Simula. Finally, the curating was completed. According to the interviews and analysis of the workshop combined with the design concept, the space and estimated budget, the curating was completed.
EXHIBITION DESIGN PROCESS

1. ASSIGNMENT
2. ANALYSIS
3. IDEA & SKETCH
4. CONCEPT
5. DESIGN & BUDGET
6. PROPOSAL 1
7. DESIGN & BUDGET
8. PROPOSAL 2
9. IMPLEMENTATION

Fig 29. Diagram 02 Exhibition design process.
Design process

1. Assignment, meetings and inventory, spring 2015
2. Concept, first design and budget estimation – declined, autumn 2015
3. Inventory, interviews and workshop, spring 2016
4. Change of the exhibition location from 3rd floor terrace to the 2nd floor, spring 2016
5. Second design and budget estimation, meeting with the Head of Department – declined, spring 2016
6. Architecture office designed something else for the exhibition space, summer 2016
7. However, agreed that I continue with the exhibition design, autumn 2016
8. Third design and budget estimation - approved, autumn 2016
9. Spatial design for the space, ACRE, spring 2017
10. Design of the stands and vitrines, spring 2017
11. Implementation of lounge furniture, late spring 2017
12. Ordering of the stands and vitrines, late spring 2017
13. Implementation of stands and vitrines, autumn 2017
14. Final implementation of the exhibition, spring 2018
15. Opening event 13th of April 2018
4.5 Inventory and curating

I carried out inventory with the staff members Jaakko Kotimäki, Miki Sirola and Seppo Äyräväinen. We went through all the devices in the storage and I photographed everything. The next big question was how to do curating, because I had no experience in IT and had little information about the history of computers. At this time I thought the task was impossible for me to accomplish. The pictures below show roughly one third of the devices of inventory.

HOW AM I ABLE TO CHOOSE FROM THESE?

Fig 30. Collage of the exhibits in the storage.
4.6 Preliminary concept

The preliminary concept idea was to find a red thread to the exhibition and to follow chronological path so I decided to focus on describing the development of computers and I created the name for the concept *Evolution of Computers*. The main principal was that I wanted to have at least some of the computers operating so that the visitors could use and test them. The first curating was done by following this concept idea.

In addition to computers, I wanted to exhibit research devices before the invasion of computers in the 1980s. To gather information, I interviewed Emeritus professor Teuvo Kohonen and Emeritus professor Olli Simula. After the interviews I knew that I needed to get more understanding of computers to help me to curate them. But on the other hand, I did not want to get too much information that I would not know how to use. The idea of the enormous amount of information regarding the history of computers got my head to spin. Then I realized that I needed to gather people to discuss about the exhibition, gather relevant information and test the computers. For this I organized a workshop. The logo of the exhibition was created according to the preliminary concept idea.

![Evolution of Computers logo](image)
4.7 Workshop

The *Evolution of Computers* workshop was organized in 15.2.2016 at 10-13 at T-talo, the Department of Computer Science. It was held on the 3rd floor terrace, because at that time the exhibition was meant to be located there. Later in spring the space changed to be the 2nd floor terrace.

At first there was open discussion that was filmed at 10.15-11.00 am. After this there were time to test the computers and to fill in the forms at 11-13 am. All participants filled in forms individually. The aim of the forms was to gather information and opinion about the devices and computers.

**Workshop participants:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olli Simula</td>
<td>Emeritus Professor, Department of Computer Science</td>
</tr>
<tr>
<td>Päivi Kiuru</td>
<td>Staff, Art Coordinator, Aalto ARTS</td>
</tr>
<tr>
<td>Miki Sirola</td>
<td>Staff, Department of Computer Science</td>
</tr>
<tr>
<td>Jaakko Kotimäki</td>
<td>Staff, Department of Computer Science</td>
</tr>
<tr>
<td>Seppo Äyräväinen</td>
<td>Staff, Department of Computer Science</td>
</tr>
<tr>
<td>Janne Savikko</td>
<td>Staff, MA Student, Department of Computer Science</td>
</tr>
<tr>
<td>Markku Ranta</td>
<td>Staff, Department of Computer Science</td>
</tr>
<tr>
<td>Kirsi Ihalainen</td>
<td>Sound Designer, Aalto ARTS, Doctoral Student</td>
</tr>
<tr>
<td>Kristina Saajanaho</td>
<td>Designer, Aalto ARTS, MA Student, workshop photographer</td>
</tr>
<tr>
<td>Elisa Luoto</td>
<td>Exhibition Designer, Workshop Facilitator, Aalto ARTS, MA Student</td>
</tr>
</tbody>
</table>
1. OPEN DISCUSSION

At first there was an open discussion at the workshop that was filmed at 10.15-11.00 am.

QUESTIONS AND ANSWERS:

I have combined the result of the open discussion and the answers of each participant here below.

1. What would you like to tell with the exhibition?

The staff of the Department of Computer Science sees that the most important theme from the information technology point of view is: “The history of the technical development in IT”. All participants were concerned of how to get visitors to come and see the exhibition. Especially, Kirsi Ihalainen highlighted the importance of engaging visitors and to think of what could be media sexy and interesting to the visitor?

According to Art Coordinator Päivi Kiuru, it is relevant that the exhibition project supports interdisciplinary in Aalto: Computer Science combined with Art and Design. Seppo Äyräväinen was asking that are mobile devices part of the exhibition too? Mobile devices are actually also computers, but there is higher risk for stealing, so there must be separate vitrine that can be locked. At that point, it was decided to highlight the development of computers and therefore the idea was to leave mobile devices out. Also the first design concept and estimated budget that included vitrines was not approved by the Head of the Department. This is why, it was uncertain that there be any desire or budget to exhibit items that should be locked.

According to Markku Ranta the speech recognition research by Teuvo Kohonen represents the development of research. It might be possible to reconstruct the interface if needed, because it was simple construction. There can be found a film of the speech recognition in action. Also, the event of the 40th birthday celebration of the Laboratory of Information Technology was filmed on the 3rd of May in 2005. This video could be played in the exhibition in a separate screen. There are other old videos such as presentations of Helsinki University of Technology (TKK = Teknillinen korkeakoulu) before Aalto University. Kari Torkkeli knows about these videos.

How to define which computers to choose?
The staff told that the same computer might have been used in an office or at home, in that case mostly used to play games. How to show the research, science and content of the computers?

Research use: The unix workstation was used in research for coding and was rather boring to use. Unix´s were so expensive that nobody could afford to buy it home.

Entertainment use: In the beginning of the 80s PC´s were not so effective but in the turn of year 2000 they were as efficient and more affordable.

Computers had different programs such as Microsoft Office programs: Word, Excel but these have not changed dramatically so these are not the best way to illustrate the evolution. Maybe some graphical programs might have developed more remarkably, Paint for instance. But perhaps games have developed the most regarding experience and visuals, developed from 2d to 3d. In case the exhibition would tell about gaming, Ihalainen remarks that video game consoles play a significant role along with computers. One exhibition reference might be the exhibition in the Museum of Technology in Helsinki many years back where there was a timeline and a screen describing the development and visitors had the possibility to play games.

Fig 33. Open discussion was filmed, pic by K. Saajanaho.
Is the exhibition about evolution of computers in general, or is it about the use of computers throughout the history of the Department?
Miki Sirola states that the focus should be in the history of the Department Laboratories, but some other devices can tell other story. It is also relevant to take into consideration that the visitors might act wrong. Should the devices be attached with wire because there won’t be any control. The original idea was that the devices are not so valuable so the risk of stealing is minor.

2. What is the aim of the exhibition according to you?

The aim is to display the technical development behind the research in the department and how that has influenced on teaching. Päivi Kiuru suggests that the space could serve as a place for events, leisure and interaction between staff, students and visitors. The exhibition should be easily understandable and preferably a piece of art that can engage visitors to take part in it. It could be something more than an exhibition, an comprehensive experience with audio for example. Perhaps one of the computers could be a demo stand to present the latest accomplishment, the newest of the new, that might change within time and would showcase the resent research in the Department.

3. To whom is the exhibition for?

All participants agree that the exhibition is mainly targeted to students, staff and visitors. However, the staff will visit the exhibition rapidly and will visit again only with external visitors to show the exhibition to them.

Päivi Kiuru raises questions: What about if the exhibition could be a place where everybody from Aalto could come and visit? Can the exhibition be for everybody, also for people who are not familiar with IT? How can you engage visitors to take interest and to participate in the exhibition?

EVOLUTION OF COMPUTERS:

4. How can you show evolution?

The development can be displayed with calculation capacity and with the evolution of user interface. Office programs have not developed much in 20 years, so they will not offer much for visitors. Games show the evolution of the graphi-
41

The evolution can be physically displayed with recording media samples. Other ways to show evolution are videos, timeline, years and comparison. One interesting comparison might be the price of the computer compared to the price of coffee at the time.

5. Which programs would do it?

Games and user interfaces show calculation capacity graphically (fractals). Maybe some image or text processing programs such as Microsoft Word or Paint. Games would be good but the department might not have enough games to show evolution.

6. Which games?

The first games were 2D games such as Pong, Wheel of fortune, Tetris or Space Invaders. Good examples of 3D games could be Tron, Wolfenstein 3D, Doom or Quake. This is depending on the fact which games can be found from the department or the staff, if it is not allowed to bring external computers or games such as Commodore64, Atari, Amiga etc.

2. TESTING THE COMPUTERS

One purpose of the workshop was to find out which computers can be operating so that visitors could test even some of the computers in the exhibition. We managed to start most of the computers and for example IBM needed some preparing. All the research devices were not able to get on operating and we concluded that actually that was not crucial. The most important thing was to get computers operating. We also measured the dimension of the computers.

Fig 34-35. Testing IBM personal AT, pic by K. Saajanaho.
3. FILLING IN THE FORMS

After the open discussion and computer testing there were time to fill in the form at 11-13 am. All participants filled in forms individually. The aim of the forms was to gather information and opinion about the devices and computers. Here I have gathered all the answers from the forms. The devices and computers that got no answers are left out of the analysis.
ANALYSIS OF THE FORMS

RESEARCH DEVICES

1. NRS 290, Digital data processing

1. Facts
The researcher: Olli Simula
Year: 1976-79
Size: L 48.5, D 46.5, H 28 cm

Additional material / media:
Several publications, 8 in 1977-1980

Use of the device:
Programmable digital filter was build for research. Comput-
er language was it´s own RTL code language
( Register Transfer Language ). Program code was
“burned” directly to the ROM memory.

Speciality / research / development / story:
NRS 290 was used to investigate digital filter processing
in real time applications in the 70s. Especially, digital filter
structures and their computational properties were inves-
tigated in practical implementations. The research group
co-operated intensively with the telecommunications indus-
try and this basic research had a strong impact a decade
later when Nokia released its first GSM handsets.

2. To show the evolution with working devices
a. is it still working?
No, to re-program is not likely, because of the availability of
memory cards

Fig 39. NRS 290, article Vuoden huipulla.
RESEARCH DEVICES

2. Co-processor board for a speech recognizer

1. Facts
The researcher: Teuvo Kohonen
Year: 1975

Use of the device, speciality / research / development:
Text by Teuvo Kohonen:
“The automatic recognition of speech has been a research topic in the Laboratory of Information Technology since 1975. This application requires a very high computing capacity especially in the following tasks: 1. Preprocessing of the speech signals (analog-to-digital conversion of the acoustic signals, logarithmization, normalization, and the Fourier and cepstrum-analyses). 2. Segmentation of phonemes from continuous speech. 3. Recognition of the phonemes. Especially in the recognition stage, several of our own methods were tested. During 1984-85 we used the so-called learning subspace method (description of each phoneme by a linear combination of phonemic samples, and tuning of the method adaptively). For the above tasks we designed a co-processor board that was build around the Intel signal processor chip 80186. This board could be used in any IBM PC AT-compatible computer, and the PC carried out the postprocessing (transformation of the stream of phonemes into written text, and correction of errors). For arbitrary Finnish text, the recognition accuracy (in real time) was on the order of 94 per cent, when speech samples had been collected from each speaker beforehand.”

2. To show the evolution with working devices
a. is it still working? No

Fig 40. Co-processor board for speech recognizer.
RESEARCH DEVICES

3. HP9000

1. Facts
The researcher: Teuvo Kohonen
Year: 1984

Use of the device, speciality / research / development:
Text by Teuvo Kohonen:
“The workstation computer HP9000 of Hewlett-Packard was launched in 1984, and this particular workstation was used by Academician Teuvo Kohonen since about 1985. Its operating system was HP-UX, a Hewlett-Packard version of Unix, but there was also an interactive programming language included, which made HP9000 very suitable for this work, since it was then not necessary to re-translate the source code every time when modifying it, and furthermore, the parameter values of the model could be immediately varied from the keyboard during the runtime of the program, without stopping it. These features turned out to be very useful when Prof. Kohonen was developing his famous SOM algorithm he invented in January 1981. The SOM belongs to the category of nonlinear adaptive dynamical system models, and there did not exist any other way of developing it than experimenting with a great number of structures, functions, and parameters of the model. After the limits of operation had been established, the algorithm could be encoded using more effective programming languages, and applied to a variety of practical tasks.

2. To show the evolution with working devices
a. is it still working? No

Fig 41. HP9000, at the office of Teuvo Kohonen.
RESEARCH DEVICES

4. CNAPS

1. Facts
The researcher: Teuvo Kohonen
Year: 1994
Size: L 13,5, D 46, H 45,5 cm

Use of the device, speciality / research / development:

Text by Teuvo Kohonen:
“The so-called artificial neural networks, the operation of which resembles that of biological neural networks, comprise one of the principal research areas of the Laboratory of Information Technology. The neural networks can be simulated by computational algorithms, but one needs a very high computing capacity for that. Before the general-purpose computers became powerful enough, special parallel computers were needed, and the SIMD (single instruction stream, multiple data stream) architecture seemed to be most useful for our purposes. Our laboratory was the first customer in Europe who bought the Adaptive Solutions SIMD “neurocomputer” CNAPS. It was first used for the mapping of large document collections onto the Self-Or-

2. To show the evolution with working devices
a. is it still working? No

Fig 42. CNAPS, pic by K. Saajanaho.
5. IBM Personal AT

1. Facts
   Year: 1984
   Size: L 54, D 42, H 46
   Keyboard: P 46, S 21
   Printer: P 37, S 30, H n. 15

Use of the device:
research

Speciality / research / development / story:
Apparently, IBM Personal AT has been the first desktop-unix in the Department of Computer Science. For this computer the operating system has been Xenix.

2. To show the evolution with working devices
   a. is it still working?
   Yes, the computer works and it is possible to have it in operation in the exhibition. But it seems that the hard drive did not run for the try out.

Fig 43-44. IBM Personal AT.
COMPUTERS

6. NeXTstation

1. Facts
Year: 1990
Size: L 40, D 40, H 51 cm
Keyboard: PL45, D 14.5, H 5.5 cm

Use of the device:
research

Speciality / research / development / story:
Originally the second NeXTstation in Finland, importer had the first one

2. To show the evolution with working devices
a. is it still working?
Yes, the computer works and it is possible to have it in operation in the exhibition. Manuals and the undate disk are preserved.

b. which program/game would be characteristic? - program, software, game

CHOSEN TO THE EXHIBITION

Interface Next OS is interesting as itself. Additionally the computer can be connected to the internet, so for example it is possible to use old web browser.

Fig 45. NeXTstation.
COMPUTERS

7. SGI 02 Silicon Graphics

1. Facts
Year: Published in 1996, 1998
Nickname: Toaster, vacuum cleaner

Use of the device:
Desktop unix for the reasearcher, connection to the calculation server through the internet.
These computers have been operating in student classes.

Speciality / research / development / story:
There can be found the entire set of SGI workstations from the end of 80s to the beginning of the 2000 in the department. SGI servers are from the 90s.

2. To show the evolution with working devices
a. is it still working?
Yes, the computer works and it is possible to have it in operation in the exhibition. There are many workstation so there are plenty of spare parts. There are not so many screens left but it is possible to connect almost to any screen.

CHOSEN TO THE EXHIBITION

b. which program/game would be characteristic? - program, software, game
Many programs and games can be used: Quake and maybe Quake 2. SGI 02 uses operating system IRIX.

Fig 46. SGI 02, many workstations in the storage.
COMPUTERS

8. Macintosh Plus

1. Facts
Nickname: “Birdhouse”
Year: Published in 1986

Use of the device:
Mostly home use and entertainment.

Speciality / research / development / story:
Seppo Äyräväinen has the entire set with the package also and there are two pieces in the storage.

2. To show the evolution with working devices
a. is it still working?
Yes, the computer works and it is possible to have it in operation in the exhibition.

b. which program/game would be characteristic?
- program, software, game
There are many games.

Fig 47. Macintosh Plus.
COMPUTERS

9. VT 510 Terminal

1. Facts
Year: 1993

Use of the device:
Used as text terminal to run different text based programs remotely.

Speciality / research / development / story:
This individual computer has been working as a screen terminal in the laboratory engine room for the maintenance of different servers.

2. To show the evolution with working devices
a. is it still working?
Yes, the computer works and it is possible to have it in operation in the exhibition. This requires to be connected with a server.

b. which program/game would be characteristic? - program, software, game
For example a video game called Nethack.

Fig 48. VT 510 Terminal.
1. Facts
Nickname: “Aquarium”
Year: 1998

Use of the device:
Mostly home use and entertainment.

Speciality / research / development / story:
Desk unix was used in research, teaching and 3D modeling.
Softwares were IRIX and Linux. Media was CD-ROM.

2. To show the evolution with working devices
a. is it still working?
Yes, the computer works and it is possible to have it in operation in the exhibition.

b. which program/game would be characteristic?
- program, software, game
There are many games.

Fig 49-50. Box and manuals of iMac G3.
4.8 Concept

The final concept followed the preliminary concept idea of *Evolution of Computers*. I was encouraged to follow this path because workshop results showed that it was possible to have computers operating in the exhibition. The most important themes were to engage visitors and to show evolution. For this, I wanted to find a way to illustrate evolution visually and I started to look for a game that had evolved through the years 1980 to 2010. I discovered that this combining element could be Super Mario Bros. I had been playing this game as a child in the 1990s. I found out that the game originates from the 80s and it is still played even nowadays. So Super Mario Bros became my concept character.

*Fig 51-52. Super Mario Bros character from the 1990s.*
SUPER MARIO VIDEO EVOLUTION

Research devices 1970s
IBM Personal AT 1984
Macintosh Plus 1986
NeXTstation 1990
iMac G3 1998
Apple MacBook 2010
Inside the computer 2000s


Fig 53. Illustration of the Super Mario concept idea and the video screens above the computers.
Because the main idea of the exhibition was to show evolution and development of computers it was logical that also the presentation would be chronological. Also, the idea of Super Mario illustrating the development guided me to place the exhibition stands next to each other chronologically to tell the story clearly. The concept of *Evolution of Computers* and Super Mario opened me the spatial design layout. Next was to design how the concept idea of Super Mario as the evolution character would be implemented to the exhibition. I had two ideas: the first was to have Super Mario as screen saver in every computer and the second was to have additional screens above the exhibiting computers where there could be a video of Super Mario running. The next big question was how to execute these ideas. There were many options, one was to use old stands from the storage to install additional screens (illustration below). But in the end the idea of Super Mario did not come to life.

*Fig 54. Illustration of the Super Mario concept idea and the stand installation.*
4.9 Final design

The final design includes lounge furniture, lighting and exhibition design. During the project I did three proposals of lounge furniture design for ACRE. The third proposal got accepted in the beginning 2017 and ACRE ordered furniture and lighting from Modeo Oy. Exhibition stands were designed by me and custom made by Helsingin Lasi ja Puu Oy.

4.9.1 Lounge furniture design

The following pages include the final design of lounge furniture. For the design I visited several times Modeo and Kvadrat showroom to choose the furniture and textiles. Since that time I had decided that the exhibitions stands would be black so I wanted to bring some colour and warmth to the space with furniture textiles and brass lighting shades.

Fig 55. Render 01 Illustration of the exhibition space and lounge furniture.
CHosen furnITure

Modeo sofa table,
2 x Diam. 600 H 520
4 x Diam. 800 H 720

Fatboy The Original,
4 x purple

Tom Dixon BEAT fat
4 x brass

Viccarbe Maarten chair
6 x Clara 2 888,
black legs and armrests

Zeeta sofa L 1300, D 670 mm
2 x ZED2 without armrest
Steelcut trio 2 yellow 453

Zeeta sofa,
Steelcut trio 2 orange 533
1 x ZED2A armrest right
1 x ZED2B armrest left

Zeeta ottoman
2 x Steelcut trio 2, 533
2 x Steelcut trio 2, 453
FURNITURE VOLUMES

Zeeta sofa 4 pcs.

Zeeta ottoman 4 pcs.

Viccarbe Maarten chair 6 pcs

Fatboy The Original, purple 4 pcs.

Modeo sofa table 6 pcs.

Tom Dixon BEAT fat brass 4 pcs
Fig 56. Layout of lounge furniture and exhibition stands.
Fig 57. Illustration of lounge furniture corner.
Fig 58. Illustration of lounge furnishings in the middle of the space and the exhibition stands.
Fig 59. Render 01 Side view. Illustration of the exhibition space. The idea of video screens with Super Mario was not implemented in the end.
Fig 60. Render 02 Front view. Illustration of the exhibition space.
4.9.2 Exhibition design

I designed the stands for the exhibition and they were custom made. The exhibition is designed to be permanent so the chosen materials are to last. I send many requests for proposals during spring 2016 but in the end, there were only one contractor that was able to execute both stands and glass vitrines. We made successful cooperation with contractor Helsingin Lasi ja Puu Oy.

The final design included the following elements:

STANDS
- 5 pcs exhibition stand
- size 900 x 900 x 1400 mm
- material 16 mm mdf sheet
- solid, except the bottom is empty, miter cut in the corners, fillet edges
- holes diam. 60 mm 2 pcs per stand, all together 10 pcs
- 5 pcs cut on the bottom edge 20 x 100 mm, behind, in the middle of the stands (cuts for wires)
- 8 pcs holes in the stands 20x100 mm (holes for wires)
- painted black, half gloss
- glass vitrines glued to the stands

GLASS VITRINES
- 2 pcs 8 mm clear chill glass
- size 900 x 1400 x 350 mm
- hinges and double doors at the end of the stands, a lock in the middle (close to the column)
- rabbet for the vitrine stands

GLASS SHEETS
- 3 pcs 8 mm clear chill glass sheet
- size 1400 x 900 mm

TRANSPORTATION
- transportation to the address of the client: Konemiehentie 2, Otaniemi, Espoo
Technical drawings

LAYOUT

5 x STANDS
- size 900 x 900 x 1400 mm
- material 16 mm mdf sheet

2 x GLASS VITRINES
- size 900 x 1400 x 350 mm
- rabbet for the vitrine stands
- all dimensions are in millimeters

Fig 61. Layout of the stands and furniture.
Fig 62. Section 01 Front view towards the stands.
Fig 63. Section 02 Back view from behind the stands, the rail is left behind the section line.
LAYOUT DIMENSIONS

- hinges and double doors at the end of the stands, a lock in the middle (close to the column)
- needed to open the doors

- holes on the top of 2 stands with vitrines, diam. 60 mm 2 pieces each stand
- other stands without any holes on the top sheets

Fig 64. Layout illustrating detail dimensions of the stands and vitrines.
BACK DIMENSIONS

- holes behind three stands, diam. 60 mm 2 pcs per stand (stands without the glass vitrine)
- 5 pcs cuts on the bottom edge 20 x 100 mm behind and in the middle of the stands (cuts for wires)

Fig 65-66. Section 03 Back view illustrating detail dimensions of the stands and vitrines.
SIDE DIMENSIONS

- double doors attached with hinges on the sides, a lock in the middle
- there are no holes on the sides of the stands

Fig 67. Section 04 Side view illustrating detail dimensions.

Fig 68. Section 05 Side view of the stands and vitrines.
EXHIBITION STANDS

Fig 69. Render 03 Illustration of the exhibition stands, vitrines and devices.
4.10 Implementation

The implementation stage was inspiring because I could finally see the end results. Nevertheless, the implementation as a whole took a while. Before anything could be ordered there was budgeting to do. This was a little nerve racking because the client had not given me any figure of budget and their wish was to receive design and budget proposals and in case they would get excited the proposals might be accepted. All together, I made three design and budget proposals of the exhibition and the third one got accepted in autumn 2016. About lounge furniture I also made three proposals for ACRE Aalto University Campus and Real Estate and the third one got accepted in spring 2017.

The lounge furniture got delivered in late spring and lighting was installed in late summer 2017. Regarding the exhibition I still needed to send more requests for proposals of stands and vitrines and also of graphic prints. The stands were installed in the late summer and graphics in late autumn 2017. Power sockets and spotlight were installed by Lassila ja Tikanoja in autumn 2017. The final installation of the devices and computers took place in spring 2018.

Fig 70. Installation of the lounge lighting.
Stages of implementation:

1. Budget proposals, autumn 2016
2. Request for proposals of stands, spring 2017
3. Delivery of the lounge furniture, spring 2017
4. Installation of the lighting, summer 2017
5. Installation of the stands, late summer 2017
6. Installation of power sockets and spotlights, autumn 2017
7. Request for proposals graphic print, autumn 2017
8. Installation of graphics, late autumn 2017
9. Installation of the devices and computers, spring 2018
10. Opening event, spring 2018
THE EXHIBITION SPACE IS READY

Final stage of implementation was to install the devices and computers on top of the stands. Computers were attached to electricity.

Some of them needed final adjustments and replacing of some components. This stage was done by the staff members Jaakko Kotimäki and Janne Savikko.

Fig 74-75. The exhibition and the space are ready.
Fig 76-77. Exhibition space, lounge furniture and lighting.
4.11 Opening event

Fig 78-79. Opening event April 13th 2018, IBM was running game Wheel of fortune, photographed by Matti Ahlgren.
Fig 80-81. Opening event, visitors engaged in testing computers, pic by M. Ahlgren.
Fig 82-86. Computers in operation, Quake in SGI 02, pic by M. Ahlgren.

Fig 87. Detail of the exhibition logo.
Fig 88-91. Research devices above and vitrine below shows what components were inside of the computer around 2000, pic by M. Ahlgren.

Fig 92. Close up to the inside of the computer around 2000.
5. CONCLUSIONS

While researching and designing the exhibition I focused on the key theme of engaging visitors through exhibition design. This was the most important aspect for me to take into consideration in my task. Here I conclude by answering to the research questions (chapter 2.1) which I describe in the beginning of the thesis. Through this study I have realized how comprehensive and responsible the role of the exhibition designer is. The designer is a facilitator trying to hold all the exhibition components together. The designer needs to take into consideration all the parties that are involved such as the client, the artist, the curator, the executors and above all the audience. Other crucial exhibition elements are for example exhibition space, content, budget and timetable. The most important guide for designing is to have a clear concept. A clear concept and aim help the designer to make decisions and justify them. For instance, the concept determines choices regarding atmosphere, function, furniture and lighting.

In my exhibition design project for the Department of Computer Science I came across a situation where I was basically responsible for the entire project except for the physical implementation work. This meant, that I was responsible for inventory, curating, concept ideation, workshop organizing, spatial design, furniture and lighting design, graphic design, budgeting, bidding, timetable and organization of the implementation. Whereas, in museums there are normally a separate curator, graphic designer and people to take care of the implementation. But as in real life, all projects are different. In general, the exhibition designer’s task is to bring all the elements together and create a comprehensive experience for visitors and engage them.

From the very beginning of my thesis project I had decided to concentrate on this core idea of how to engage visitors. Because the assignment of exhibiting old computers seemed challenging for me in order to make it interesting, I realized the importance of creating something that would engage exhibition visitors. With the help of my research and case study, I conclude that the aim of exhibition is to attract and get visitors attention. People are in general hard to engage because it is hard to raise their interest. This is why, the exhibition designer needs to focus on storytelling to create a coherent and effective experience, that will stay in visitor’s minds even after the visit.
A successful exhibition is interesting, engaging and lively. In order to succeed in this, the designer needs to step into the role of the visitor and imagine how he/she might think and act. In the *Evolution of Computers* project it was rather easy for me to imagine how a common person might think, because I was neither myself familiar with the IT topic. I wanted to create an experience that also a person without IT background would get interested in the exhibition objects and take part in the exhibition by testing computers. The purpose of any exhibition is to communicate and transmit the meaning of the exhibition to the visitor. Storytelling is a powerful way to do this. The designer must aim to make the exhibition experience as comprehensive and engaging as possible.

The *Evolution of Computers* exhibition succeeded to fulfil the aim of engaging visitors. Fortunately, we succeeded in realizing the core idea of having computers operating. During the opening event visitors were testing the computers. IBM Personal AT from the 80s was running Wheel of fortune, NeXTstation from the 1990 was connected to the internet, SGI 02 from the mid 90s was running 3D game Quake, iMac G3 from the late 90s was running a video

*Fig 93. Computers in operation at the opening event, pic by M. Ahlgren.*
presentation of Helsinki University of Technology (TKK) in cd format and the MacBook laptop from 2008 was uploading current updates and was showcasing one of the first laptops that people started to work with and carry. The entire process of the exhibition design process was long (3 years) and taught me a great deal. I also believe that it was due to patient processing and comprehensive thinking that the results were successful and that the exhibition got implemented after all. I am very proud of the work that we have done together with the Department of Computer Science in order to make this exhibition come to life, to get computers operating and to engage visitors.

Thank you:
Department of Computer Science, Aalto University
Emeritus Professor Olli Simula, Academian Emeritus Professor Teuvo Kohonen
Staff: Jaakko Kotimäki, Janne Savikko, Seppo Äyräväinen, Jari Saramäki, Miki Sirola, Markku Ranta
Art Coordinator Päivi Kiuru, Sound Designer Kirsi Ihalainen
Photographers: Kristina Saajanaho and Matti Ahlgren
Thesis supervisor: Pentti Kareoja
Thesis advisor: Marco Rodriguez
REFERENCES

LITERATURE:


Locker, Pam (2011), Exhibition design. AVA Publication, Switzerland.


FIGURES:

Figures and photos without reference are taken and produced by me, Elisa Luoto. I had the privilege of using visual material by photographers Kristina Saajanaho and Matti Ahlgren.