ZEIT&RAUM

SUPPORTING DOCUMENT

HEIME 'T HART - 02-07-2024

complex CP projects

ZEIT&RAUM

GRADUATION FORM

HEIME ’T HART

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Heime ‘t Hart
Student number	5699991

Studio		
Name / Theme	Complex Projects: Bodies & Building Berlin	
Main mentor	Olindo Caso	Architecture
Second mentor	Rico Heykant	Building Technology
Third mentor	Martin Grech	Architecture
Argumentation of choice of the studio	The Complex Projects studio gives students the option to design an ‘one-of’ typology in Berlin. Both the location or context of the studio and the project sounded like an interesting challenge to undertake for my graduation.	

Graduation project	
Title of the graduation project	Zeit&Raum: the next generation state-history museum of Berlin.
Goal	
Location:	Klingenberg Hkw, Berlin (Germany)
The posed problem,	The education on the topic of **history** is more important than ever, as it is vital to the understanding of geopolitical changes, to reflect and develop critical thinking. However, history as a subject is declining in popularity as children find it too far removed from their experiences or repetitive. Historically, **museums** have played a significant role in raising historical awareness and educating the public, as they did too in Berlin. More recently however, history related museums have shown a decline in their yearly visitor stream, raising the question whether museums are still relevant in our highly digitalized

	information society. Studies on the topic show that museums do not seem to connect to younger audiences anymore. Besides that, **digitalization** is not a threat to museums, but rather a tool they can use to engage with their audiences. Important here is that the museum offers the visitor an experience. These experiences are also beneficial to the education of history, as a shared experiences amplifies its effects. Now, it is true that museums already use digitalization to enhance their experiences, but it is my believe that with the technology available in 2024, much more can be achieved, such as a digitalized form of time travel. However, to house this concept, a new generation of history museum is required.
research questions and	In which ways can digitalization impact the design for the next generation state-history museum of Berlin, benefitting the re-engagement with the young?
design assignment in which these result.	The aim of the Zeit&Raum museum is to offer young people (ages twenty-four and down) a new experience as it comes to history education in the form of museums. This museum uses the capabilities of digitalization to its full potential and lets visitors experience time travel in its Digital Engagement Spaces by means of immersive sounds and visuals as well as interactive props and figures. After this engaging experience, they continue to learn more about what they just witnessed in the ancillary exhibition space. Aside from the learning aspect, the museum facilitates its visitors in the following reflection and discussion in dedicated spaces. These three elements form the core of the museums program. Together, they support the core benefits of history education. Furthermore, as part of the digitalization group of the Complex Projects, a strategy was formed to ‘make the invisible visible.’ This means that as a

	group we strive to integrate datacenters in our public buildings to raise awareness to the public. For the museum this means that a data processing plant will be on site but rather than current presidents, this data center will be open to the public and aims to educate them rather than hide away. The Zeit&Raum museum will be located on the site of a closing down power station in Klingenberg, Berlin. The initiative for the museum comes from the State of Berlin itself and will be operated as the 20th addition to the Staatliche Museen zu Berlin's portfolio. To project the historic experiences, the museum works together with the state archives (owned by Berlin itself), TU Berlin and ILM who are an internationally acclaimed supplier of hyper realistic projection technology.

Process

Method description

Following the provided framework from the Complex Projects studio, the aim for P2 is to develop a design brief which should function as the point of reference for the design phase after. This design brief is broken down in the topics of program, client & site.

Program

To start off, the research for the program rests mainly on the analysis of both general and specific references. This means that all relevant documentation for three 'general' history museums is analyzed to produce a more general outline for the museum's program with rough outlines for its total floor area and programmatic division. Afterwards, more specific references are studied to give form to all the envisioned parts of the museum, such as museums offering an experience as a new way to learn of museums with a special focus on the reflection on its topic. For each of these specific themes two references are studied. Aside from the programmatic division, this information also gives the direction for their relations.
Based on these analyses a program bar is made which gives direction in the forming of a relation diagram. With both the program detail in its square meters and their relations, this chapter is concluded.

Client

The Client selection starts with determining the user(s) of the museum as this choice helps narrowing down the direct of the museum. This choice is made based on the narrative stated in the introduction.

Afterwards, the client helps narrow down these choices even more. Based on desk research, the museum landscape of Berlin is studied after which a client is chosen. Following this choice, the client's organizational structure and history are analyzed, and its mission statements are turned into project ambition. However, to prevent very generic ambitions these statements are cross referenced with other actors to deliver specific project ambitions. This introduces the third part of the client chapter, namely the partners.

The partners of the museum are the actors who support its operation and help with the establishment of its core program. The selection for these partners is based on desk research.

This chapter concludes with an overview of the users, clients, and partners for the Zeit&Raum museum, their purposes or actions and an overview of their mission statements translated into project ambitions.

Site
The site selection is the product of both the group strategy and client induced ambitions.

In the first phase three requirements produced by the group strategy are drawn up to narrow down the available plots within (the ring of) Berlin. This leads to a more generic selection area of Berlin.
In the second phase, the client induced ambitions gives more specific requirements, narrowing down the potent area to defined sites.
Finally, a choice is made, and the best fitting site is selected. This site is analyzed in its history, accessibility, context, orientation and so on. This gives a clear image of the site as is and forms the basis for the intervention.

On the selected site, multiple massing's are tested using the calculated volume of the program. Considerations for program, site and client form a matrix of options, showing the potential and restrictions of the site. From this overview three options are selected, and the program is injected. This is the basis for the design phase.

Literature and general practical references

Reference projects:

General references (history museums):

- Museum aan de Stroom, Antwerp (BE)
- James-Simon Galerie, Berlin (DE)
- Zeughaus (Deutsches Historisches Museum)

Theme specific references (Learning, reflection, discussion & Data):

- Fabrique des Lumieres, Amsterdam (NL)
- Pergamon Panorama, Berlin (DE)
- Exploratorium, San Fransisco (USA)
- Futurium, Berlin (DE)

- Netherlands American Cemetery Visitor Center, Margraten (NL)
- Jüdisches Museum Berlin, Berlin (DE)

- M/S Maritime Museum, Helsingør (DK)
- Beeld & Geluid, Hilversum (NL)

- Datacenter AM4, Amsterdam (NL)
- Google GRQ3a, Eemshaven (NL)

Discontinued references (History & industrial reuse):

- Panorama Mesdag, The Hague (NL)
- Waterlinie museum, Bunnik (NL)
- FRAC, Dunkirk (FR)
- Tank, Shanghai (CN)

Literature & Sources:

- Berlin, Staatliche Museen Zu. z.d. “Staatliche Museen Zu Berlin”. Staatliche Museen Zu Berlin. https://www.smb.museum/en/about-us/history/
- Boothby, Erica J., Margaret S. Clark, en John A. Bargh. 2014. “Shared experiences are amplified”. Psychological Science 25 (12): 2209–16. https://doi.org/10.1177/0956797614551162
- Cole, Margherita. 2023. “Who Was Ennigaldi-Nanna? Learn about the Woman Who Founded the World’s First Museum”. My Modern Met. 30 juni 2023. https://mymodernmet.com/ennigaldi-nanna-founded-the-first-museum-in-the-world/
- Eulenstein, Michael Louis, en Michael H. Faber. 2023. “The Digital Leap: Museums Adapting to COVID-19 and Beyond”. ICOM. 23 augustus 2023. https://icom.museum/en/news/the-digital-leap-museums-adapting-to-covid-19-and-beyond/
- Fromm, Jeff. 2023. “Re-Examining the Role of Museums in the Digital Age: MIM Director Weighs In”. Forbes, 23 maart 2023. https://www.forbes.com/sites/jefffromm/2023/03/23/re-examining-the-role-of-museums-in-the-digital-age-mim-director-weighs-in/?sh=400dde281ebd
- Gonchar, Michael. 2018. “Are Museums Still Important in the Digital Age?” The Newyork Times. 11 september 2018.

https://www.nytimes.com/2018/09/11/learning/museums-protection-internet.html
- . Heafner, Tina. 2004. “Using Technology to Motivate Students to Learn Social Studies”. Learning & Technology Library (LearnTechLib). 2004. https://www.learntechlib.org/primary/p/21905/
- Olivia Weaver, Daily American. 2019. “Question of the Week: Are Museums Still Relevant with the Digital Age?” The Daily American, 30 januari 2019. https://eu.dailyamerican.com/story/entertainment/2019/01/30/question-of-the-week-are-museums-still-relevant-with-the-digital-age/116105782/
- Quotient Technology Inc. 2023. “Quotient DOOH Resources”. Quotient Digital Out-of-Home. 19 juni 2023. https://www.ubimo.com/blog/articles-and-research/museum-attendance-by-visitor-demographics/ABerlin%20Studiocomplexprojects38
- “Rising Visitor Numbers in Berlin Museums”. z.d. Berlin.De. https://www.berlin.de/en/news/8157479-5559700-rising-visitor-numbers-in-berlin-museums.en.html
- Schug, Mark C. z.d. “Why kids don’t like social studies.” https://eric.ed.gov/?id=ED224765. “The Nation’s Report Card”. z.d. https://www.nationsreportcard.gov/
- Ρούσσου, Μαρία. 2004. “Learning by doing and learning through play”. Computers in Entertainment 2 (1): 10. https://doi.org/10.1145/973801.973818.

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The Zeit&Raum museum aims to become the next generation state-history museum of Berlin. To achieve this ambition, the museum not only applies the capabilities of digitalization but also houses the normally invisible side of our digital society. With this, it brings together bodies, buildings and Berlin, which is the theme of the studio. On a larger scale, the lens of digitalization searches for an answer on what digitalization will do to the built environment, affecting all who make use of it or work with it, meaning all. Digitalization impacts both the museum typology as the praxis, this graduation project aims to research its positive applications for the younger generations.

2. What is the relevance of your graduation work in the larger social, professional, and scientific framework.

Aside from the already unprecedented changes digitalization has had on our society and this graduation project’s position in it, the museum goes further and tries to be an environment for young people to learn, reflect upon and discuss about history. Its importance lies in the importance of the subject history itself and how its declining popularity. History is vital to understand our ever-changing modern world and helps us reflect and think critically, which are skills needed for a well-functioning society. By applying digitalization, the Zeit&Raum museum aims to rekindle the young’s interest in the (history) museum.

ZEIT&RAUM

DESIGN BRIEF

HEIME ’T HART

Figure 1 | Frontpage (AI generated)

TU Delft

01/02/2024

COMPLEX PROJECTS
Bodies and Building Berlin
AR3CP100

Student
Heime ‘t Hart (5699991)

Group 8 - Digitalization
Thomas Brandt
Zeynep Canbolat
Armance Coppoolse
Yifan Dong
Yi Go
Sumeet Joshi
Chi Man Sit
Ruben Vos
Heime ‘t Hart
chair
Kees Kaan

CP coordinator
Manuela Triggianese

lab coordinator
Hrvoje Smidihen

group tutors
Olindo Caso
Martin Grech

email
infocpstudios@gmail.com

Instagram
https://www.instagram.com/
cp.complexprojects/

website
https://www.tudelft.nl/bk/over-faculteit/
afdelingen/architecture/organisatie/disciplines/
complex-projects/

facebook
https://www.facebook.com/CP_Complex-
Projects-422914291241447

Bodies and Building Berlin
Digitalization

complex projects

INDEX

Figure 2 | Sleeping child at fieldtrip (Author)

INTRODUCTION

Problem statement

History is more important than ever, especially in this rapidly changing and complex world we live in. The reasoning why it is important to learn history is wide and varied. It helps humans reflect and put current day events into perspective, helps us understand changes or to think critically. (MOOC, 2021)

But maybe its importance is best described by George Santayana in his book 'The life of reason' where he states that that 'Those who cannot remember the past are condemned to repeat it.'

However, this importance is in stark contrast with its popularity. A study held in a Midwest school district shows that history was the least popular social study taught at those schools (Shug,1982). The study goes as far as saying that students find these social studies boring and maybe more importantly, too far removed from their experiences (Shug,1982). This study, although circumstantially, is supported by an array of articles and teachers' forums stating the problem that history is perceived as boring by students. (Tan,2018)

Historically, museums have played a significant role in raising historical awareness and educating the public. For example the worlds first museum, Ennigaldi-Nanna's 'Mouseion', helped organize a variety of objects to inform and share the history of the empire. (Cole, 2023)

Moving in time and space to Berlin in the 18th century, the city's museum became a sanctuary for art and learning, educting its pupulation at the height of the enlightenment. (SMB, 2023)

Fieldtrips to musums are important as they provide real experiences. They extend the learning of the child by expanding their world and provide a framework for the learning itself. (Nabors et al., 2009)

More recently, however, history-related museums have shown a decline in their yearly visitor stream, raising the question of whether museums are still relevant in our highly digitalized information society. Berlin.de (2023)

Finally, studies on the topic show that museums do not seem to connect with younger audiences anymore. (Bingham, 2019)

Objective

A variety of articles show that digitalization is not the thread to museums but rather a tool they can use to engage with their audiences. In articles by Forbes and The New York Times the role of museum in the digital age is re-examined stating most importantly that it is about the physical experience (Fromm, 2023).

Furthermore, digitalization can further the museums mission. It also helps museums move towards a sustainable future, staying relevant and engaging to every new generation (Gonchar, 2018). Another study shows that technology in social studies such as history can be made to motivate students, supporting this push even more. (Heafner, 2004)

Approaching the topic from another side, a study from 1984 emphases the positive effect of learning trough experience and as an added medium trough media (Olson, 1974). Another study on learning by doing and trough play shows that among other benefits, people retain about 75% of what they see and do compared to just 20% of just what they hear which emphasises the importance of an interactive learning environment. The study continues by highlighting the advantages of having VR-environments for the benefit of learning. (Rousso, 2004)

Finally, in an article for the Daily Americanthe author writes that 'To understand the full impact history had on the present, you have to see it in person' (Weaver, 2019). On top of that, another paper states that a shared experience emphasis the experience, both good and bad, yet again furthering the mission of the museum (Boothby et al., 2014).

All these papers and articles cumulate in the conclusion that the education of history for children benefits from fieldtrips to the museum which applies digitalization in a shared, immersive and interactive experience. This asks for the birth of a new kind of history museum which mixes both the analog and digital world.

As this is an architectural graduation studio rather than a project on museum curation, the interest and focus of the project lay with an architectural awnser or solution which houses this new kind of history museum.

Furthermore, as part of the Complex Projects: Bodies & Buildings Berlin framework, all students were assigned a lense to research how certain societal elements or events may change the built environment. In the case of the Zeit&Raum project, this lense is digitalization which was then further specified by means of group work to the processing and storage of data.

The objective for this architectural research project is to bring all these elements together and produce an 'one-of' museum for berlin. To find find an answer, the following question was asked:

In which ways can digitalization impact the design for the next generation state-history museum of Berlin, benefitting the re-engagement with the young?

Theoretical framework

The theoretical framework is created to break up the main question into 'bite size' sub questions. The questions help guide the processes of establishing the program, a site and the users, clients and partners of the Museum.

The first question is: What kind of program does a new generation of history museum need? This question helps establish the main body of the museum's program. As described in the problem statement, history is more important than ever as it helps develop critical thinking, helps reflection on current day events putting events into perspective and thus helps people understand our complex world. These are essential for a well functioning society. The new museum shall interact with these and house them as part of its core program, divided by the learning, reflecting and talking about history.

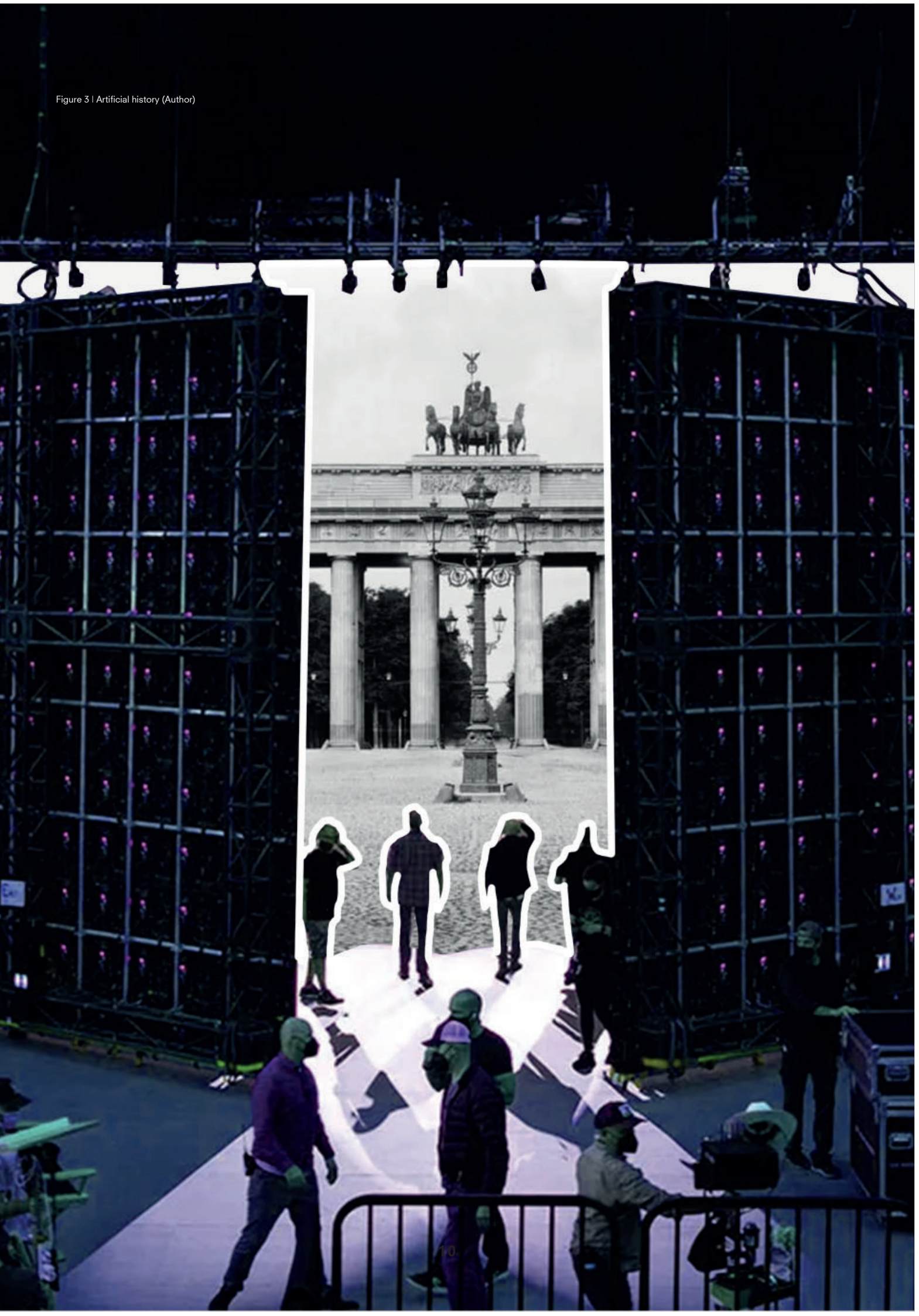
For the reflection, it is important to learn what this means or the architecture of the museum. This research will talk about what kind of environment has to be established to evoke the act of reflection or contemplation, how to guide it and even how to enhance this.

Furthermore, to give discussion or talking a place in the museum, it should be researched in what kind of environment what kinds of conversing happen. This research would talk about the different kinds of spaces where visitors and experts can talk in either a casual, professional or an in between state.

Finally, a fourth category for the processing and storage of data is required. Therefor, the following question is created: How to house the infrastructure of data processing and storage in a public building, raising its awareness to its users? Part of this question, the awareness side, shall be researched as a team effort of the digitalization group, creating a so called 'Datatecture' toolbox. For the processing and storage of data, references will be studied.

Figure 3 | Historical realities (Author)

Figure 3 | Artificial history (Author)



RESEARCH METHODS

Following the given Complex Projects: Bodies & Buildings Berlin framework, the research is conducted in three parts; program, site and client. However, throughout the project, these elements have been bound to one-another and cross referenced to produce well integrated requirements for the design brief.

Program

To start off, the research for the program mainly relies on the analysis of both general and specific references. This means that all relevant documentation (for example floor plans, sections and written media) for three 'general' history museums is analyzed to produce a more general outline for the museum's program, including rough outlines for its total floor area and programmatic division. For this phase the MAS in Antwerp is selected as a vertical state-history museum in an urban context. The James-simon as a newly built service building for the Museumsinsel in Berlin gives insight in the Staatliche Museen their ambitions and finally the Zeughaus of the Deutsches Historisches Museum is analyzed as one of the largest and most prominent history museums of Berlin.

Afterwards, more specific references are studied to give form to all the envisioned parts of the museum, namely learning (Fabrique des Lumieres in Amsterdam, the Pergamon Panorma in Berlin, Exploratorium in San Fransisco and the Futurium in Berlin), reflection (NAC Visitor center in Margraten and the Judisch Museum in Berlin), discussion (M/S maritime museum in Helsingor and Beeld en Geluid in Hilversum) and data (Dogus Tech, in Istanbul, Metro Edge in Chicago, AM3/4 in Amsterdam and GRQ3a in Eemshaven). For these themes, two to four references are as in phase one analyzed, paying special attention to their key spaces. Aside from the programmatic division, this information also gives direction for their relationships, shapes and function. All these thematic analysis are concluded with an overview of their key spaces translated to the need of the Zeit&Raum museum.

Based on these analyses, a program bar is created, which provides a basis in forming a horizontal and vertical relation diagram.

User, partner & client

The client selection starts with determining the user(s) of the museum, as this choice helps narrow down the direction of the museum. This choice is made based on the narrative stated in the introduction.

Afterwards, the client helps narrow down these choices even more. Based on desk research, the museum landscape of Berlin is studied, after which a client is chosen. Following this choice, the client's organizational structure and history are analyzed, and its mission statements are turned into project ambition. However, to prevent very generic ambitions, these statements are cross-referenced with other actors to deliver specific project ambitions. This introduces the third part of the client chapter, namely the partners.

The partners of the museum are the actors who support its operation and help with the establishment of its core program. The selection for these partners is based on desk research. Furthermore, being part of the digitalization group, a data partner is selected, based on the decimation of the existing data centers.

This chapter concludes with an overview of the users, clients, and partners for the Zeit&Raum museum, highlighting what their relation to the museum is and an overview of their missions translated into project ambitions.

Site

The site selection is the product of both the group strategy and client-induced ambitions. In the first phase, three requirements produced by the group strategy are drawn up to narrow down the available plots within (the ring of) Berlin. This leads to a more generic selection area of Berlin.

In the second phase, the client-induced ambitions give more specific requirements, narrowing down the potent area to defined sites. Finally, a choice is made, and the best-fitting site is selected. This site is analyzed in its history, accessibility, context, orientation, etc. This gives a clear image of the site as is and forms the basis for the intervention.

Based on the research thus far, several requirements are then set up to which

the mass of the museum should correspond to.

The selected site is adjusted to fit into its context by cutting where other elements may be of (more) value.

When the final plot is created, the entire volume of the museum is projected (based on the average floor height and the floor surface area).

This block is then moved across the plot to draw conclusions on its position based on how it interacts with its context.
After that step, the volume is divided in floors, testing multiple heights (in the generic middle position) to see yet again what this means for the mass and its context.

In the final step, different forms for these massings are tested.

All these conclusions finally come together several massings which best fit the program, client requirements and its context. From these massings, one is selected based on superiority in all aspects, establishing the starting volume for the design phase.

DESIGN BRIEF

Program

First, an ambition was sketch as for what the exhibition would roughly look like, and how it would work. As the exhibitions are at the core of the program, it is vital

Trough means of bench marking as described in the research methods, the program was formed. Based on three references of history museums, together with the added program of the data awareness and processing, the total floor area comes down to 20.000m² of which 20% is data, 32% is exhibitions, 16% is public, 8% is private 4% is installations and the final 20% are reserved for circulation. For a further breakdown see appendix 2.

Furthermore, based on analysis both a vertical and horizontal relation diagrams are formed. Public program and private program are bundled to create clear organization and following references their flows are separated as much as possible. Vertically, more heavy program such as data and installations are located at the bottom of the building whereas the social program such as a restaurant is located on top for its desirable location.

The programmatic core of the museum consists of learning, reflecting and discussing, in that order. In the learning section, visitors can chose to either travel through 5 time periods or six locations, all on rotation. Each exhibition starts with a digital engagement space where they can experience and interact with their digitalized environment. After visiting one, they have the choice to travel through space or time. After finishing learning about history, they continue to dedicated reflection spaces, either spaces with little distraction or a reflective garden. Finally, in the last stage they can discus what they experienced.

Site

For the site selection, the group requirements (decarbonization, decentralization & display) helped narrow the searchable area down significantly. Then the clients ambitions were introduced which through satellite research lead to a selection which was then again narrowed down to three. For these three all the requirements fit the sites making them good contenders for selection. However, the Klingenberg site in Rummelsburg had the bonus of being on a site of a transforming power station, which would like to introduce a data center in the future.

The klingenberg site is sandwiched between the Köpernicker Chausee and the Spree in one axis and some redevelopments and the architecturally appreciated power station at the other. Trough site analysis it was established that the area has potential for urban renewal, and that the museum has an obligation to respond to those (future) conditions.
For the selection of a massing, the site was first adjusted to fit its constraints and opportunities, after which the total volume was introduced. Through multiple steps of location, height, shape and orientation, three masses were selected which would best fit either program, client or site while still respecting the others. From these three client orientated mass was chosen as it respected all the requirements and its combinations led to the most promising exit point for the design phase.

User, partner & client

For the user, the projects hears to the target group as introduced in the problem statement, the young which in this project entails all under the age of 24. These individuals are the focus of the museum, but part of both the city and the SMB's (Staatliche Museen zu Berlin) missions is to create inclusive spaces, catering to all. This shall be taken into account for the design of the museum.

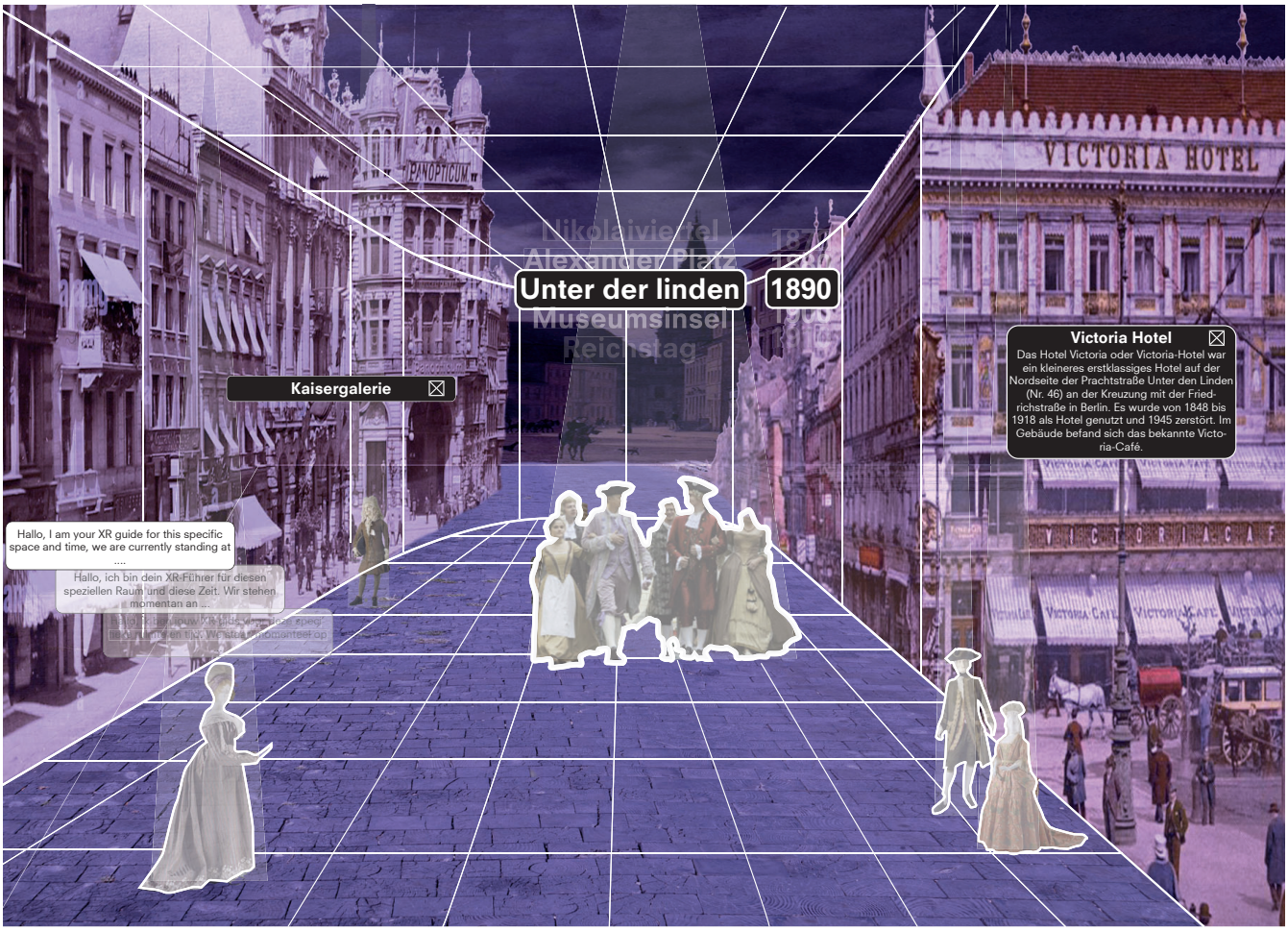
Continuing to the client, both the federal and the city government are the initiators of the museum as they both have an interest in the historical and cultural knowledge of their civilians. Together they hand down this assignment to the museum's operator, the Staatliche Museen zu Berlin, which is part of the foundation Preuzisch Kulturbesitz (SPK). They are selected as they are publicly owned, and with their large portfolio have enough in-house knowledge to support the Zeit&Raum.

These users and clients bring ambitions and missions with them, which are translated to project ambitions for the museum woven into its program, site selection and later on in the design for the museum.

To get the main body of the museum, the exhibitions, operational, three partners are selected. To deliver the vast amounts of historic documentation, the city of Berlin grands access to its archives. This raw/ physical data is then translated to digital environments by (students of) the TU Berlin, as they have both the technical and creative background needed for the task.

Finally, these immersive and interactive experiences are projected by projection world leader ILM, who specialize in hyper realistic, digitalized environments. Finally, as part of the digitalization group, NTT is selected as data partner as they own the biggest data centers in Berlin currently and with this partnership, the first step into the integration of data centers into public buildings can be made. For all these partners it is important that adequate spaces are reserved and designed in the Zeit & Raum museum. See appendix 1 for more information.

Figure 5 | DES-collage (Author)



Bibliography

Berlin, Staatliche Museen Zu. z.d. "Staatliche Museen Zu Berlin". Staatliche
Museen Zu Berlin. https://www.smb.museum/en/about-us/history/

Berlin, S. M. Z. (z.d.-a). Besuchszahlen 2019 der Staatlichen Museen zu Berlin. https://www.smb.museum/nachrichten/detail/staatliche-museen-zu-berlin-zaehlen-2019-mehr-als-4-millionen-besucherinnen/

Berlin, S. M. Z. (z.d.-b). Jahrestagung 2022: Besucher*Innenforschung Digital. https://www.smb.museum/nachrichten/detail/erfolgreiche-jahrestagung-2022-besucherinnenforschung-digital/

Boothby, E. J., Clark, M. S., & Bargh, J. A. (2014). Shared experiences are amplified. Psychological Science, 25(12), 2209–2216. https://doi.org/10.1177/0956797614551162

Cole, Margherita. 2023. "Who Was Ennigaldi-Nanna? Learn about the Woman
Who Founded the World's First Museum". My Modern Met. 30 juni 2023.
https://mymodernmet.com/ennigaldi-nanna-founded-the-first-museum-in-theworld/

Eulenstein, Michael Louis, en Michael H. Faber. 2023. "The Digital Leap:
Museums Adapting to COVID-19 and Beyond". ICOM. 23 augustus 2023.
https://icom.museum/en/news/the-digital-leap-museums-adapting-to-covid-19-
and-beyond/

Fromm, J. (2023, 23 maart). Re-Examining the role of museums in the Digital Age: MIM Director weighs in. Forbes. https://www.forbes.com/sites/jefffromm/2023/03/23/re-examining-the-role-of-museums-in-the-digital-age-mim-director-weighs-in/?sh=400dde281ebd

Gonchar, M. (2018, 11 september). Are museums still important in the digital age? The New York Times. https://www.nytimes.com/2018/09/11/learning/museums-protection-internet.html

Heafner, T. (2004). Using technology to motivate students to learn social studies. Learning & Technology Library (LearnTechLib). https://www.learntechlib.org/p/21905/

History repeating. (z.d.). College of Liberal Arts and Human Sciences | Virginia Tech. https://liberalarts.vt.edu/magazine/2017/history-repeating.html

NABORS, M. L., EDWARDS, L. C., & KENT, M. R. (2009). MAKING THE CASE FOR FIELD TRIPS: WHAT RESEARCH TELLS US AND WHAT SITE COORDINATORS HAVE TO SAY. pbworks.com.

Olivia Weaver, Daily American. (2019, 30 januari). Question of the week: Are museums still relevant with the digital age? The Daily American. https://eu.dailyamerican.com/story/entertainment/2019/01/30/question-of-the-week-are-museums-still-relevant-with-the-digital-age/116105782/

Olson, D. R., & Bruner, J. S. (1974). Learning through experience and learning through media. Teachers College Record, 75(5), 125–150. https://doi.org/10.1177/016146817407500506

Quotient Technology Inc. 2023. "Quotient DOOH Resources". Quotient Digital
Out-of-Home. 19 juni 2023. https://www.ubimo.com/blog/articles-andresearch/
museum-attendance-by-visitordemographics/
ABerlin%20Studiocomplexprojects38

Rising visitor numbers in Berlin museums. (z.d.). berlin.de. https://www.berlin.de/en/news/8157479-5559700-rising-visitor-numbers-in-berlin-museums.en.html

Roussou, Maria. 2004. "Learning by doing and learning through play".
Computers in Entertainment 2 (1): 10. https://doi.org/10.1145/973801.973818.

Schug, M. C. (1982). Why Kids Don't Like Social Studies. eric.ed.gov.

Tan, R., & Tan, R. (2018, 29 oktober). Top 5 reasons Students HATE History – and what you can do to change that. SmileTutor. https://smiletutor.sg/top-5-reasons-students-hate-history-and-what-you-can-do-to-change-that/

Team, M. B. (2021, 16 december). Why is it important to study history? https://www.mooc.org/blog/why-is-it-important-to-study-history

Top 20 - Die meistbesuchten Museen Berlins. (z.d.). berlin.de. https://www.berlin.de/museum/top-20/

Roussou, M. (2004). Learning by doing and learning through play. Computers in Entertainment, 2(1), 10. https://doi.org/10.1145/973801.973818

Figures

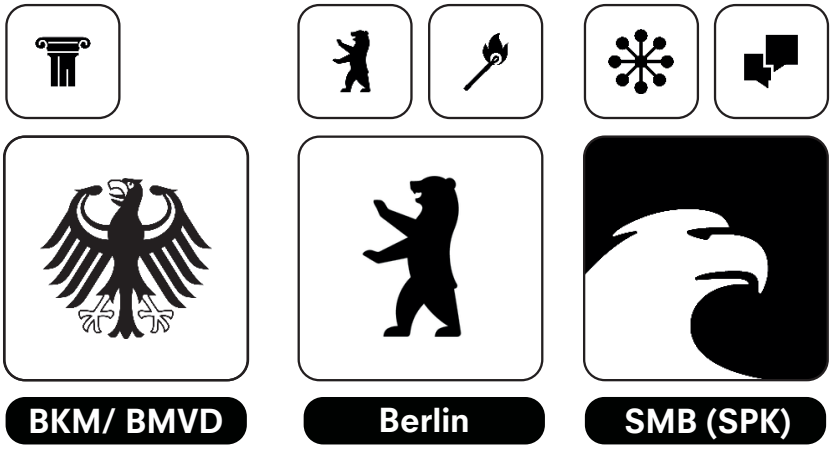
Practical references

General references (history museums):
Museum aan de Stroom, Antwerp (BE)
James-Simon Galerie, Berlin (DE)
Zeughaus (Deutsches Historisches Museum)

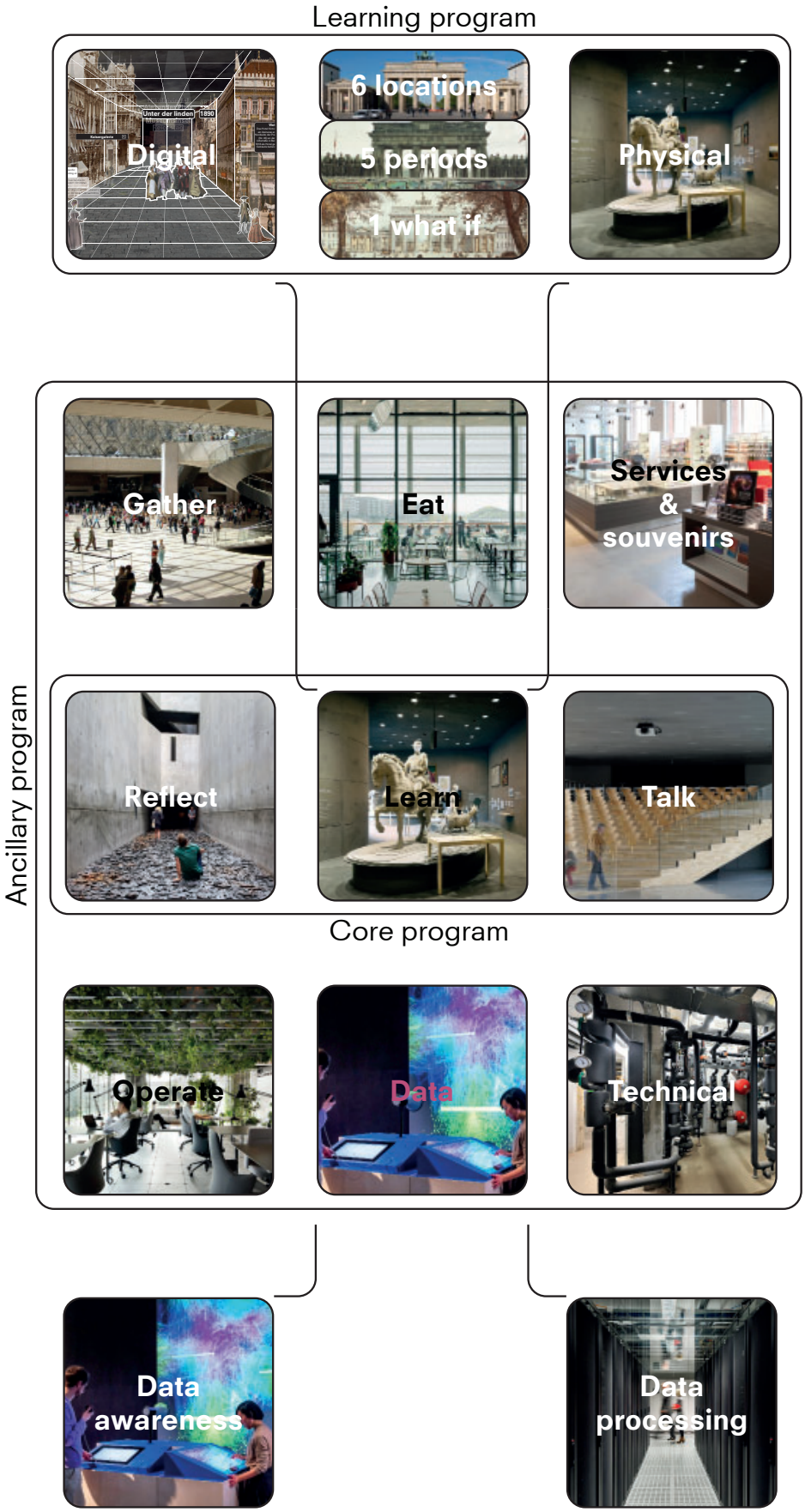
Theme specific references (Learning, reflection, discussion & Data):
Fabrique des Lumieres, Amsterdam (NL)
Pergamon Panorama, Berlin (DE)
Exploratorium, San Fransisco (USA)
Futurium, Berlin (DE)
Netherlands American Cemetery Visitor Center, Margraten (NL)
Jüdisches Museum Berlin, Berlin (DE)
M/S Maritime Museum, Helsingør (DK)
Beeld & Geluid, Hilversum (NL)
Datacenter AM4, Amsterdam (NL)
Google GRQ3a, Eemshaven (NL)

Discontinued references (History & industrial reuse):
Panorama Mesdag, The Hague (NL)
Waterlinie museum, Bunnik (NL)
FRAC, Dunkirk (FR)
Tank, Shanghai (CN)

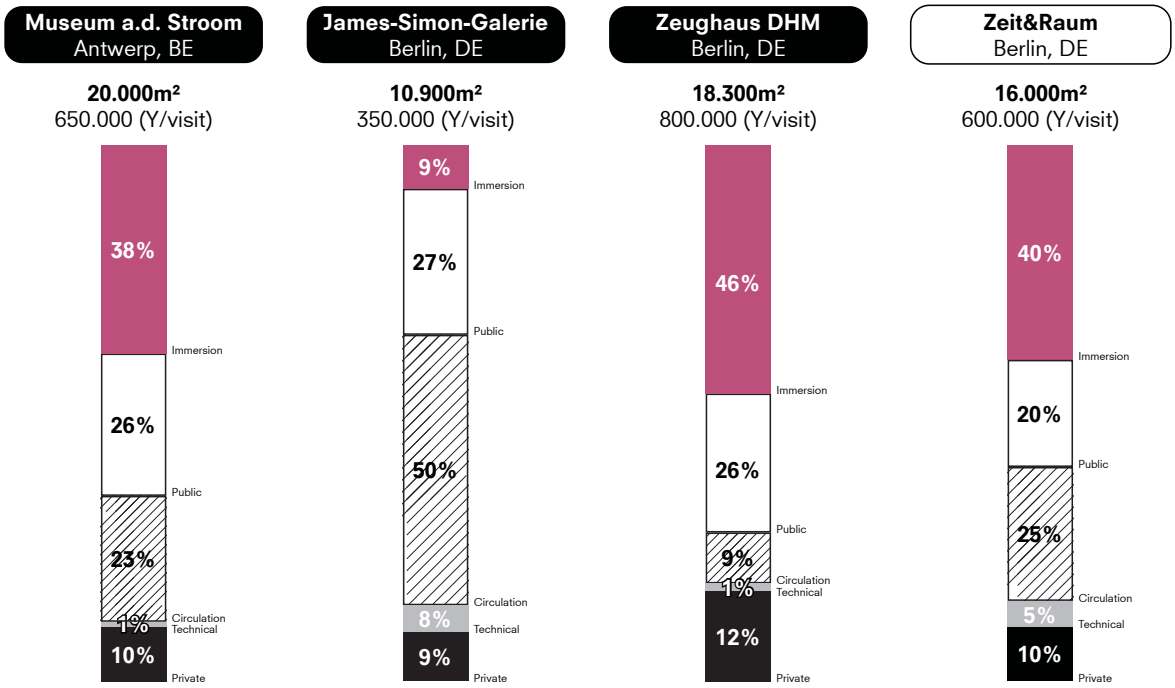
Appendix 1: User, partner & clients



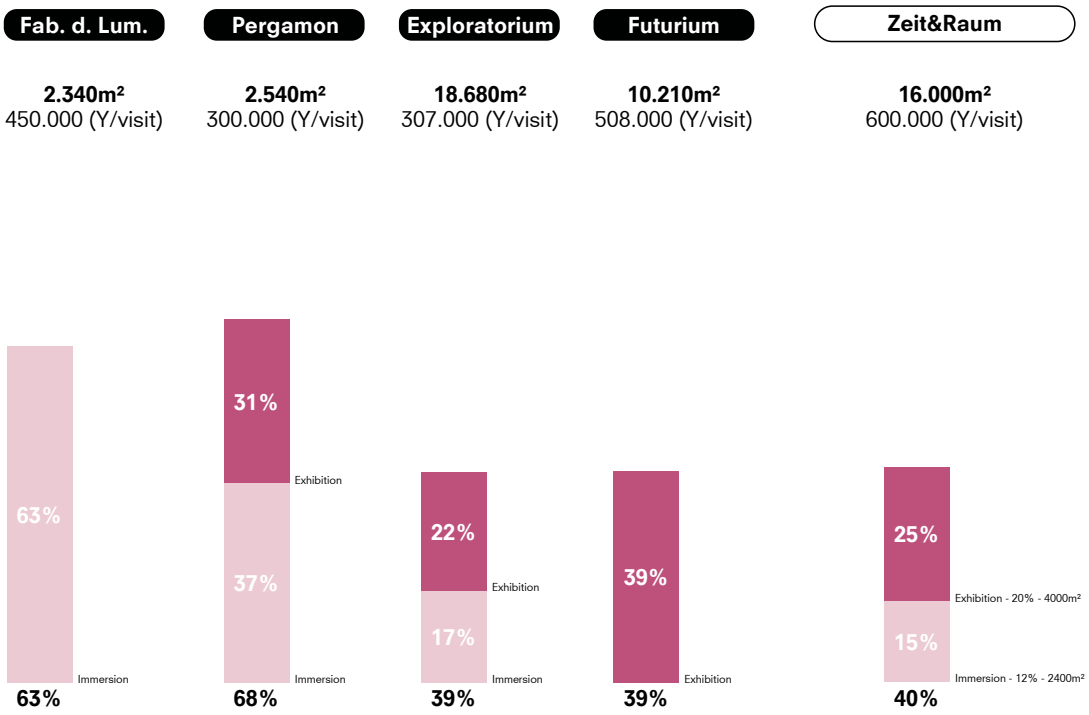
Appendix 2: Program Zeit&Raum 20.000m²



References: General program (History)



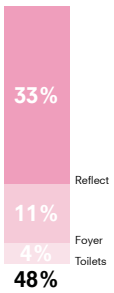
References: Learning program (Exhibits)



References: Public program

Visitor Center

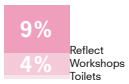
600m²
450.000 (Y/visit)



48%

Jewish Mus.

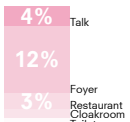
15.500m²
300.000 (Y/visit)



14%

M/S Maritime

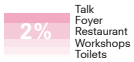
17.500m²
307.000 (Y/visit)



23%

Beeld& Geluid

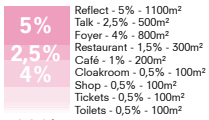
45.000m²
508.000 (Y/visit)



9%

Zeit&Raum

16.000m²
600.000 (Y/visit)

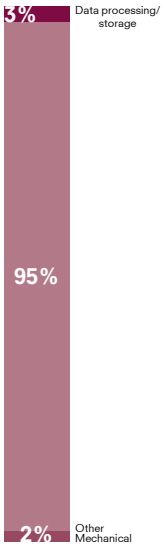


20%

References: Data program

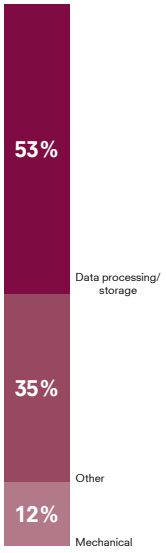
Dogus Tech

15.000m²
Internal



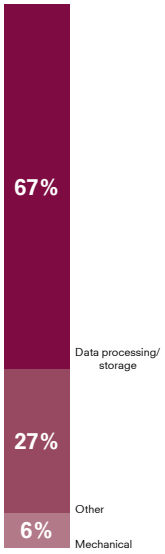
Metro Edge

18.500m²
Edge-scale



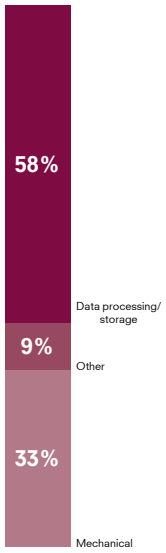
AM3/4

42.750m²
Edge-scale



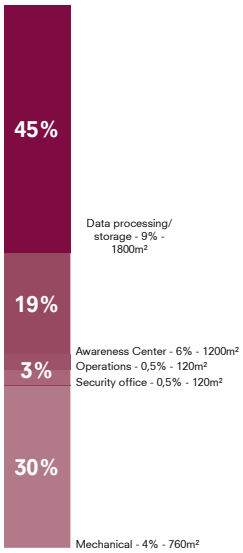
GRQ3a

68.000m²
Hyper-scale

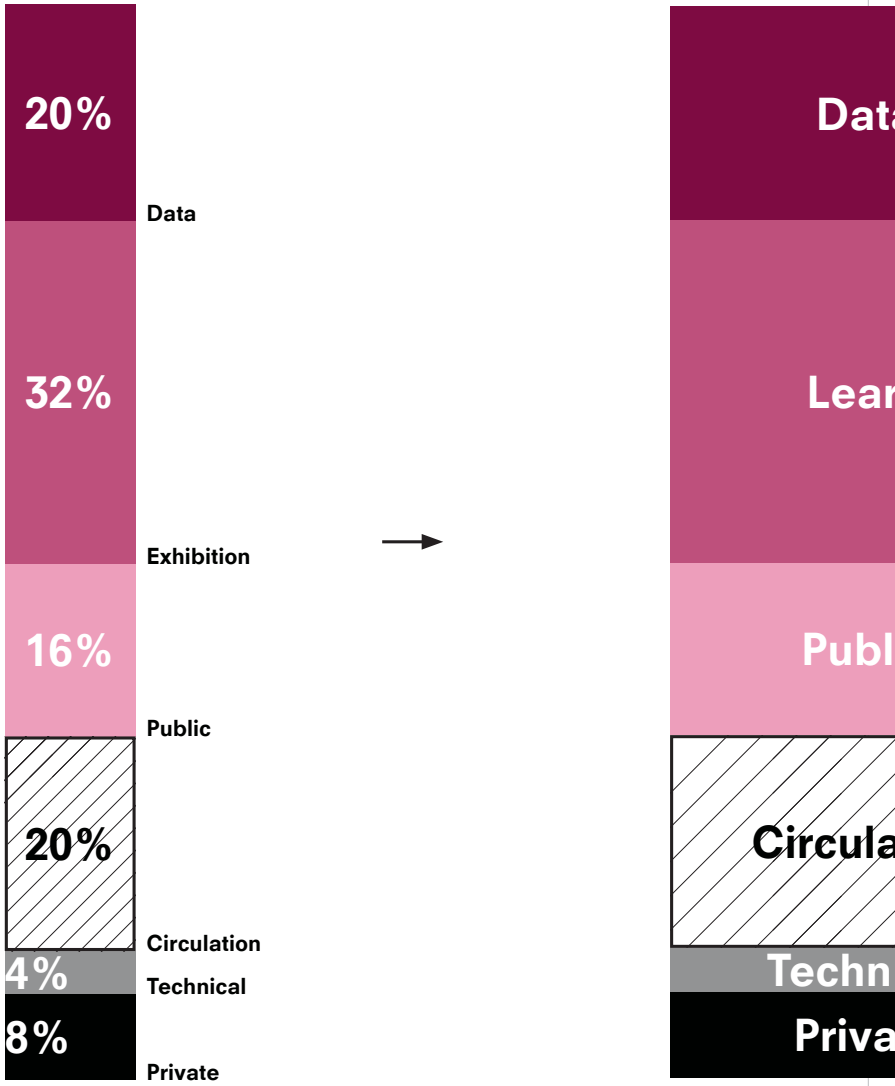


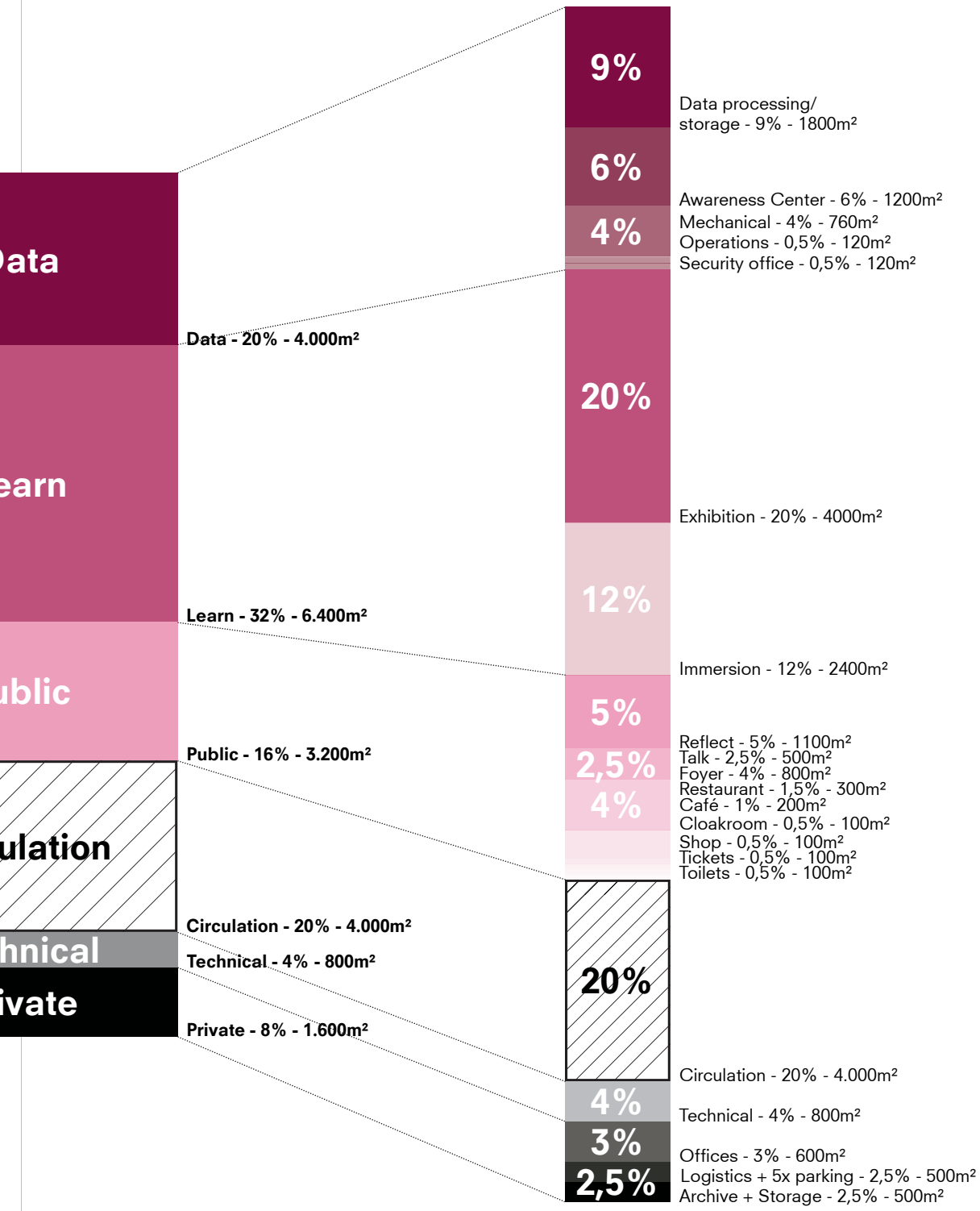
Zeit&Raum

4.000m²
Edge-scale

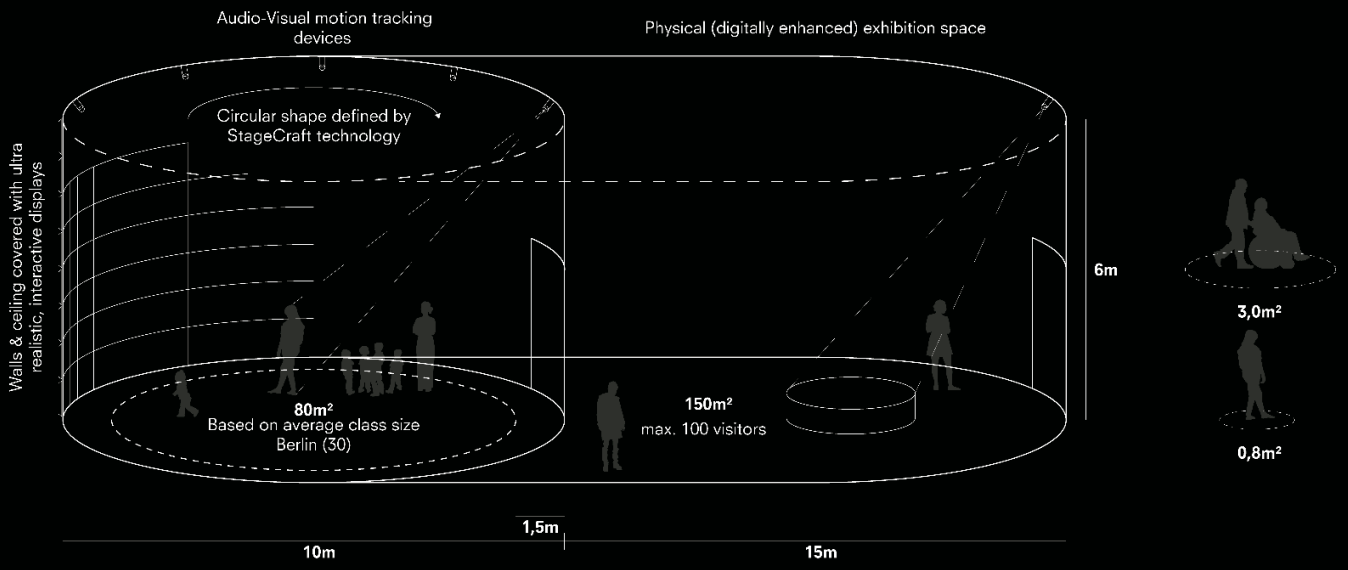


Program bar: Zeit&Raum 20.000m²

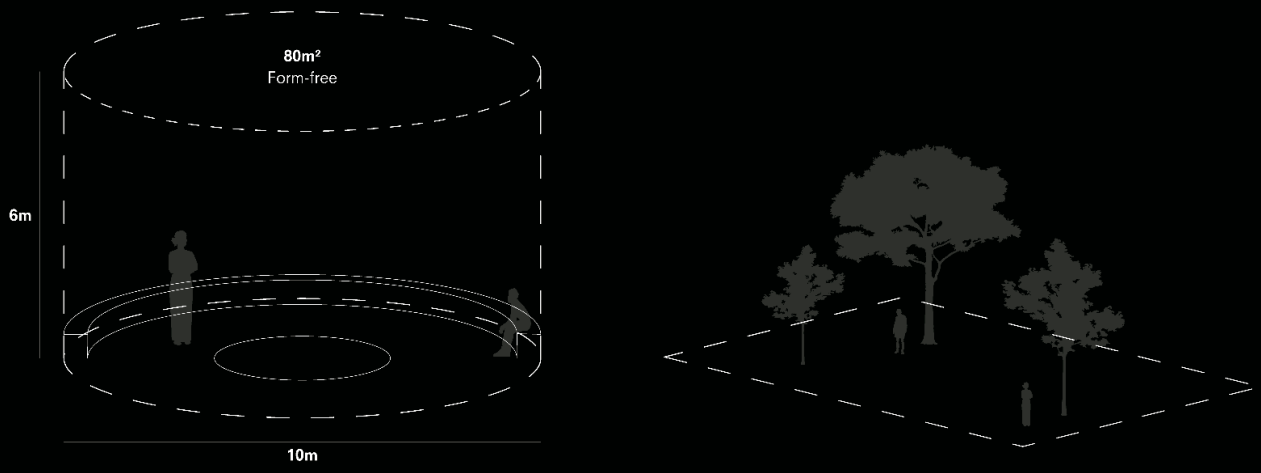



ata
earn
ublic
ulation
hnical
ivate
Data - 20% - 4.000m²
Learn - 32% - 6.400m²
Public - 16% - 3.200m²
Circulation - 20% - 4.000m²
Technical - 4% - 800m²
Private - 8% - 1.600m²
9%
6%
4%
20%
12%
5%
2,5%
4%
20%
4%
3%
2,5%
Data processing/ storage - 9% - 1800m²
Awareness Center - 6% - 1200m²
Mechanical - 4% - 760m²
Operations - 0,5% - 120m²
Security office - 0,5% - 120m²
Exhibition - 20% - 4000m²
Immersion - 12% - 2400m²
Reflect - 5% - 1100m²
Talk - 2,5% - 500m²
Foyer - 4% - 800m²
Restaurant - 1,5% - 300m²
Café - 1% - 200m²
Cloakroom - 0,5% - 100m²
Shop - 0,5% - 100m²
Tickets - 0,5% - 100m²
Toilets - 0,5% - 100m²
Circulation - 20% - 4.000m²
Technical - 4% - 800m²
Offices - 3% - 600m²
Logistics + 5x parking - 2,5% - 500m²
Archive + Storage - 2,5% - 500m²

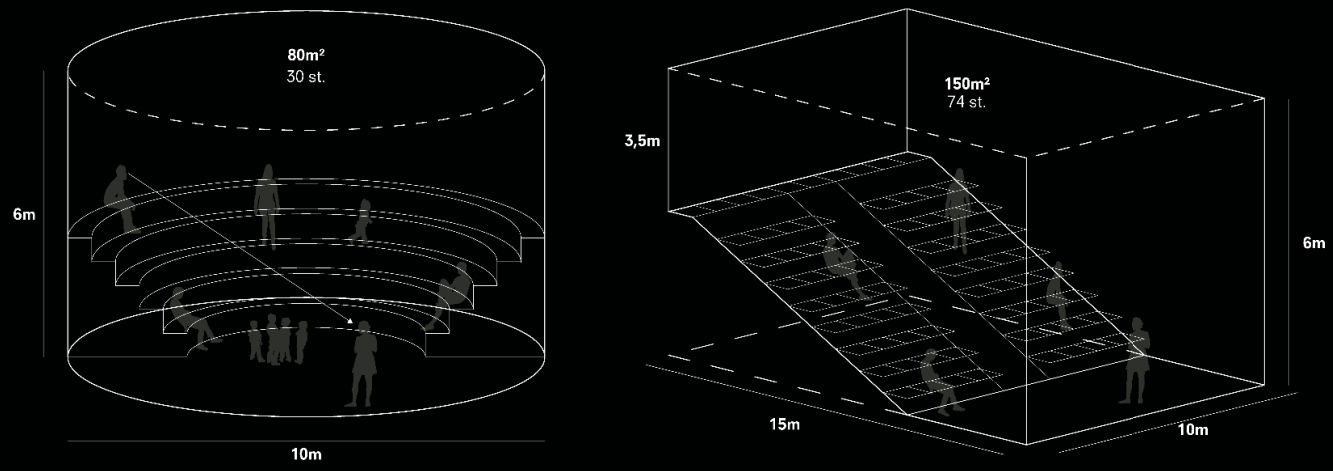
Key space: learn



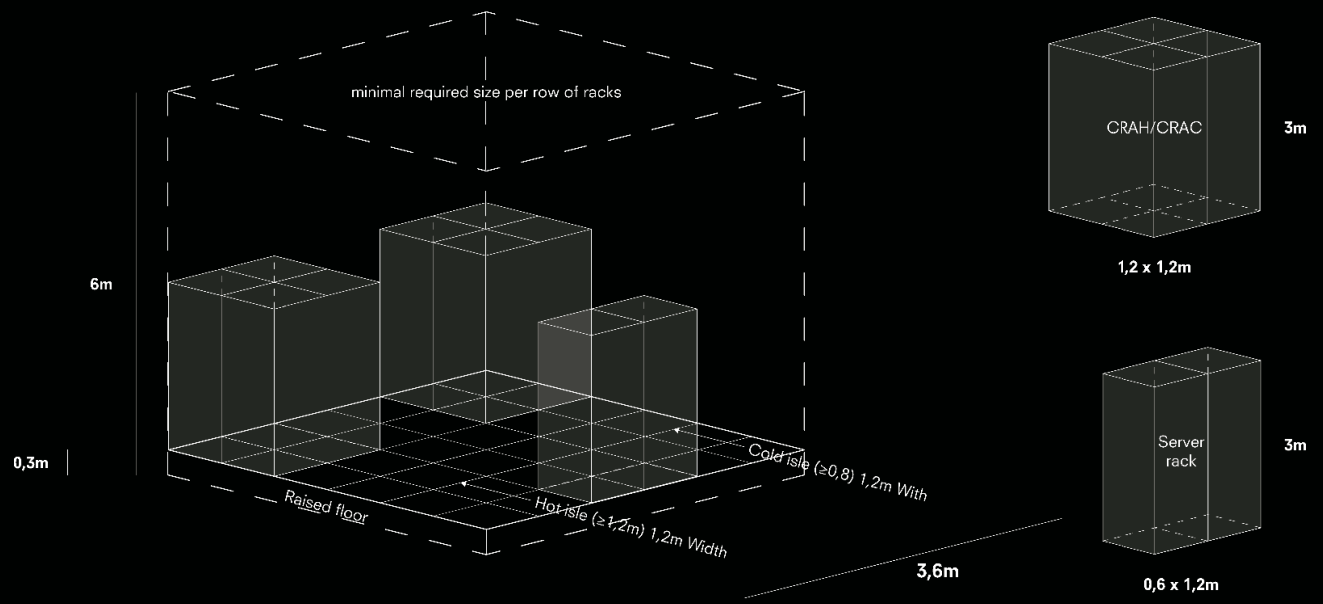
Key space: Reflect



Key space: Talk

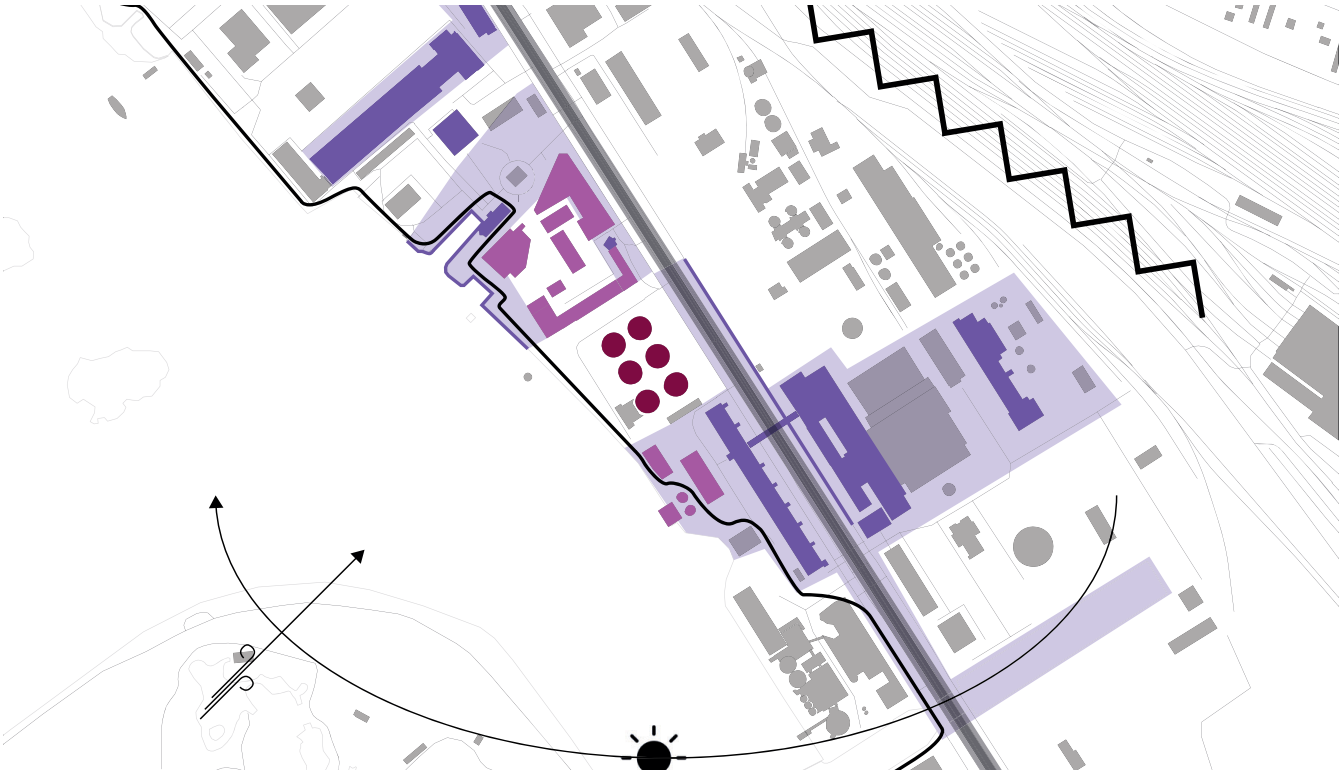


Key space: Data

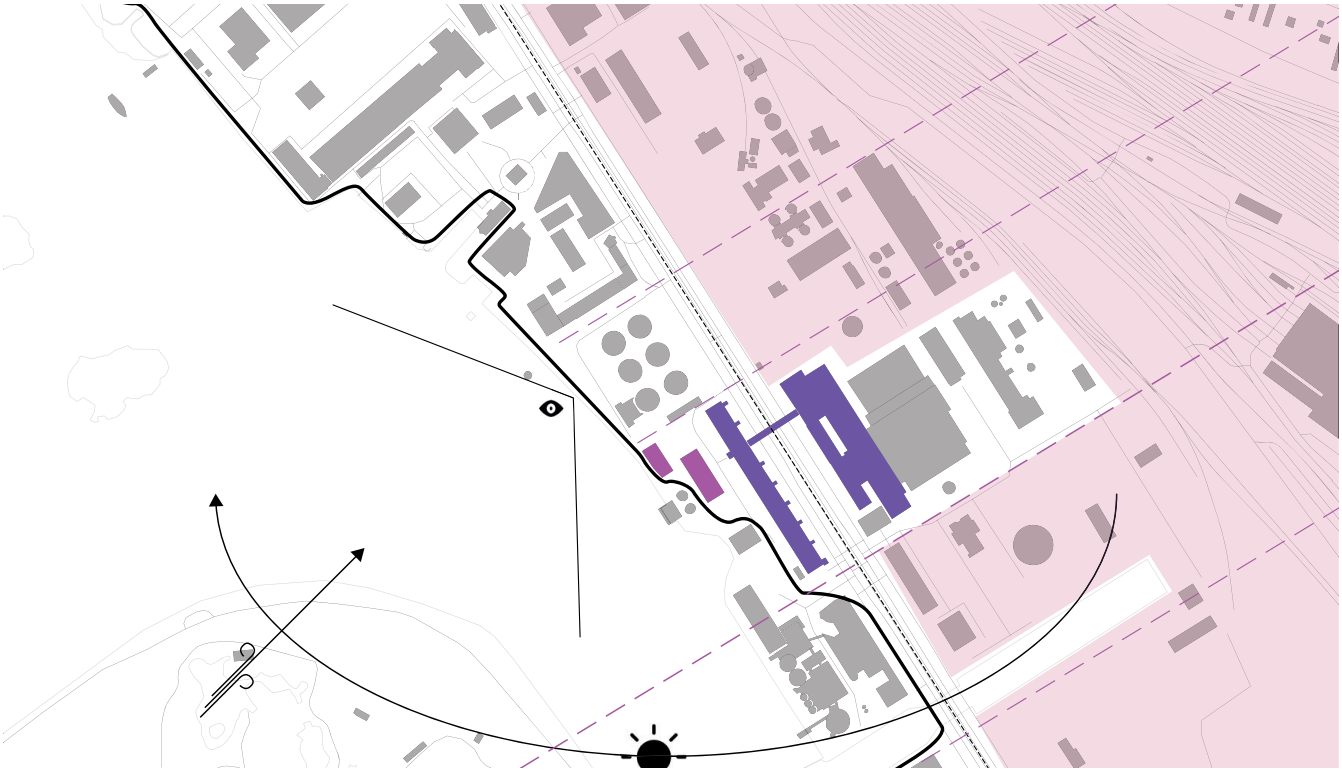


Appendix 3: Site

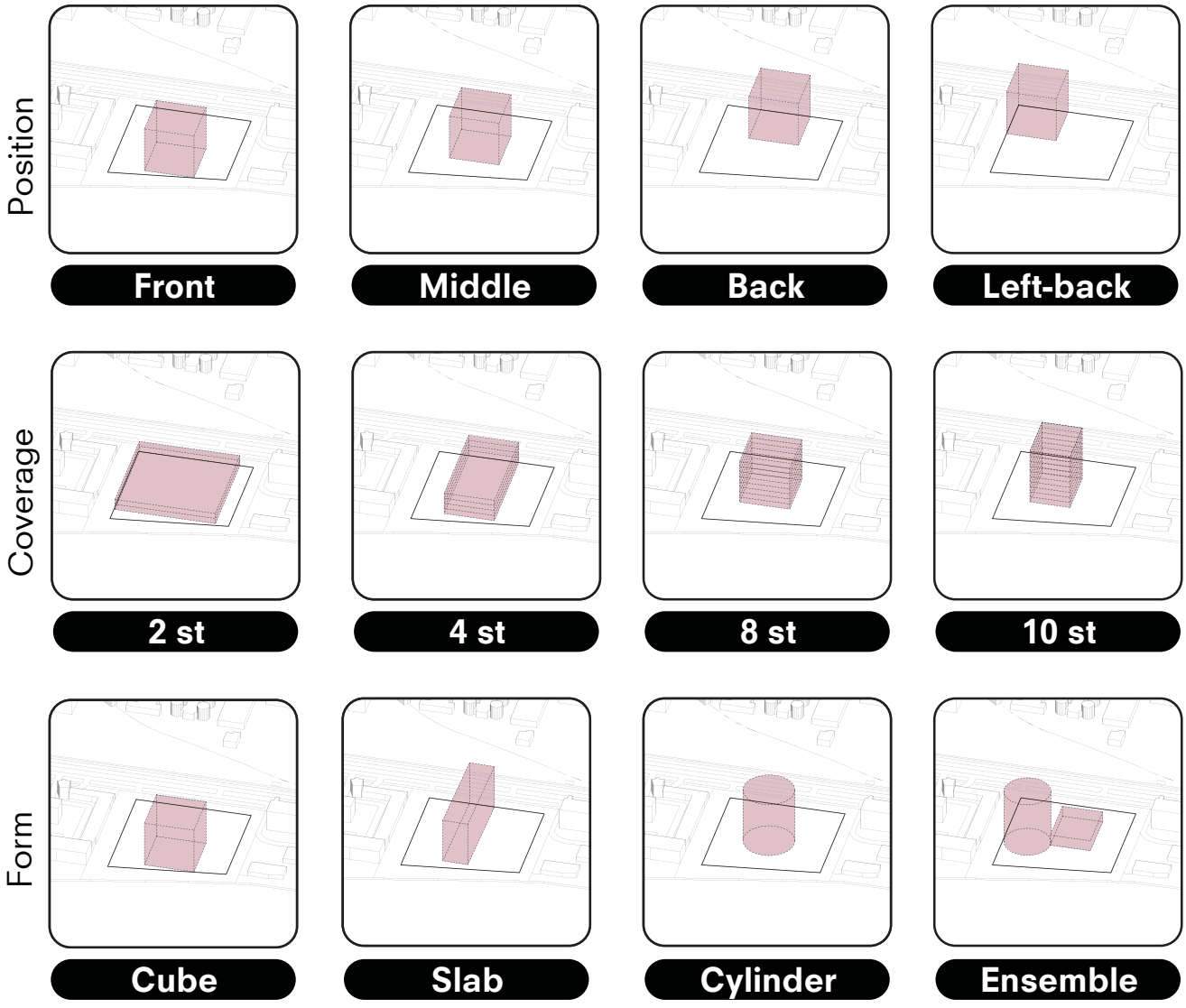
Constraints



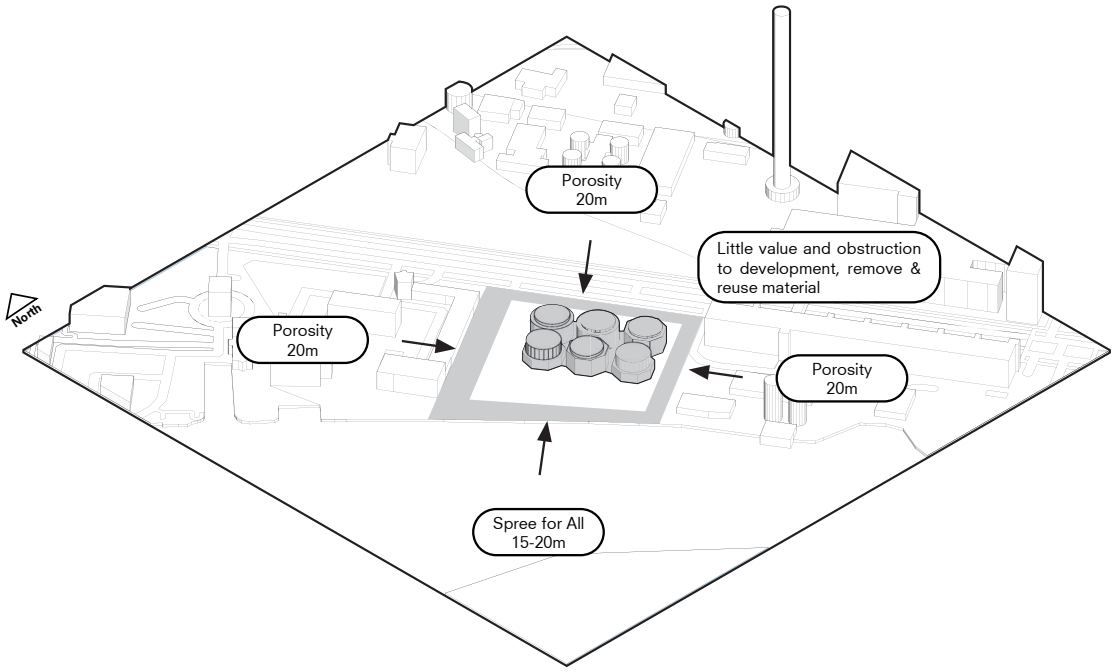
Opportunities



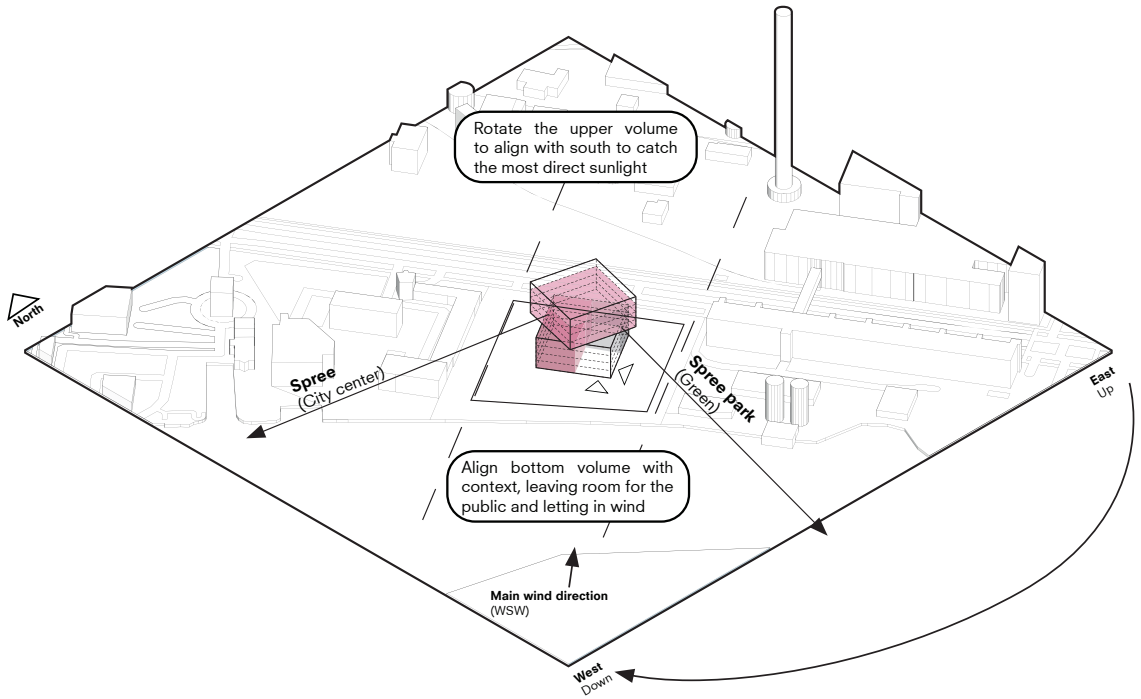
Mass testing matrix



Site exit point

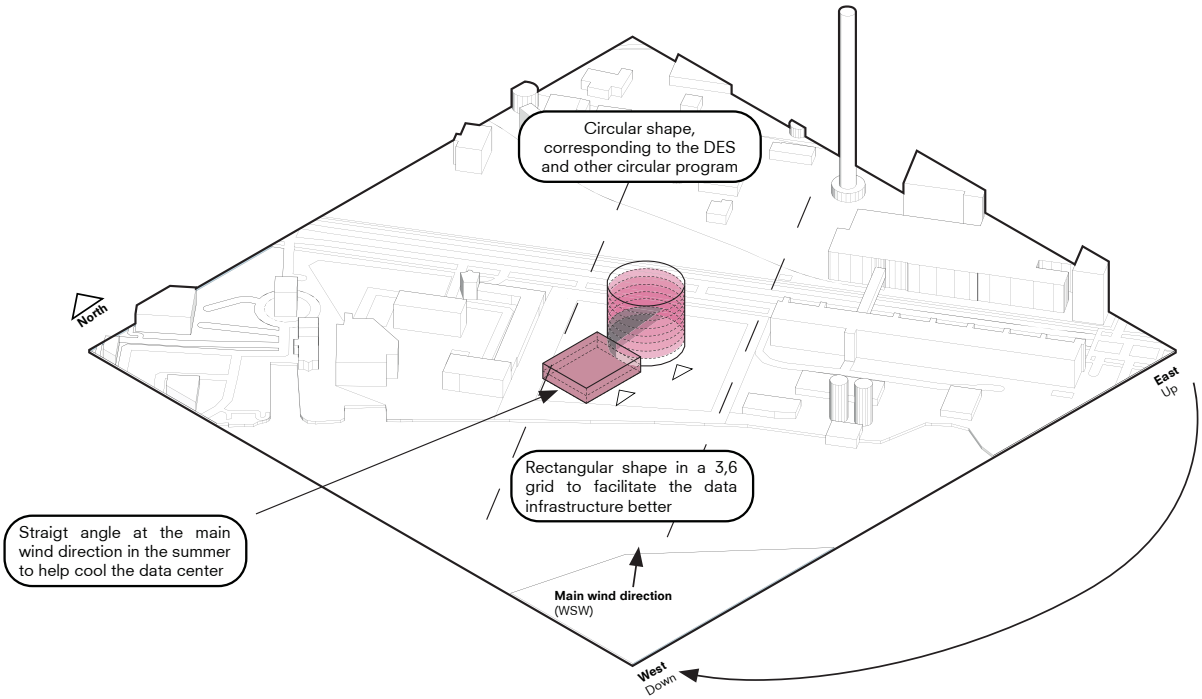


Site driven massing



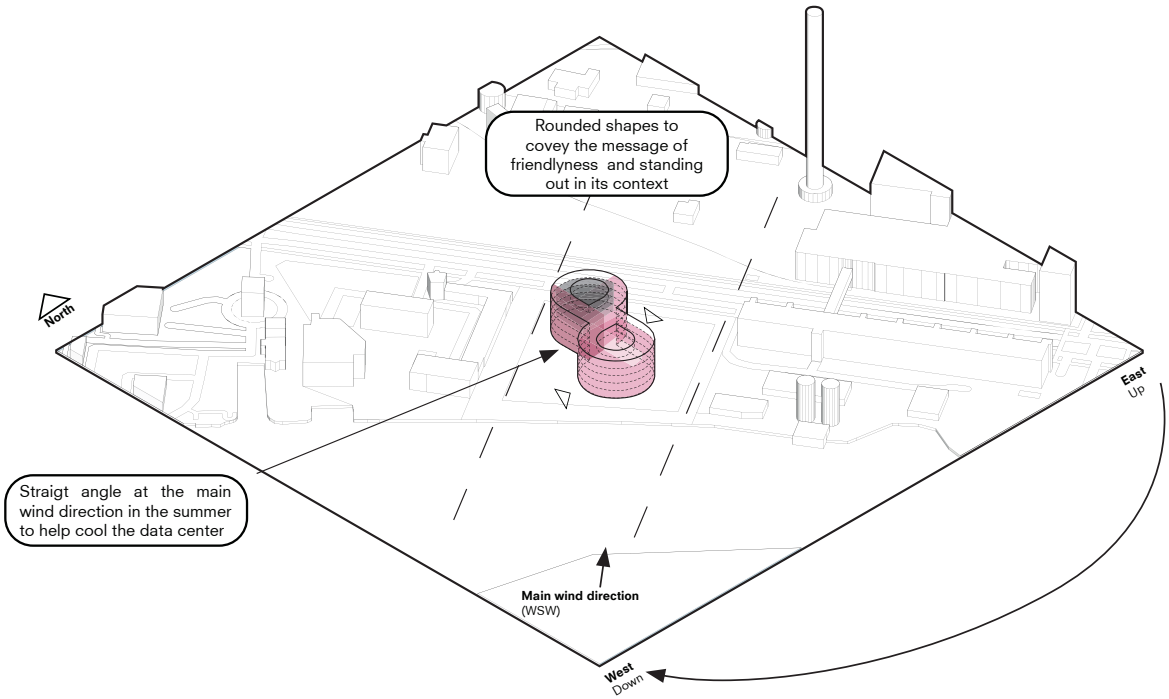
Data Exhibits Public Private Technical

Program driven massing



Data Exhibits Public Private Technical

Client driven massing



Data Exhibits Public Private Technical

ZEIT&RAUM

REFLECTION PAPER

HEIME ’T HART

REFLECTION PAPER

Project description

The Zeit&Raum project is the next generation state-history museum of Berlin, located at the former coal power plant Klingenberg.
Meant to get the youth re-engaged with history again, the museum is commissioned by the federal and state government and operated as part of the Staatliche Museen zu Berlin.

Exploring the relation of digitalization and the built environment, the research question is as follows:

In which ways can digitalization impact the design for the next generation state-history museum of Berlin, benefitting the re-engagement with the young?

As deductible from the question itself, it aims to explore the positive impact of digitalization on the design for the museum typology and its ability to engage with younger audiences. This is of importance as studies show a decline in the youths engagement with social studies such as history, which is vital in the education of the young for their critical thinking and establishing their world views, especially in a historically rich and complex country as Germany.

This creates a narrative where the ministry of education and the ministry of culture of the German government launch a program to raise historical awareness across the country. In Berlin, the capital of Germany, this materialises in funding for a new kind of historical education and thus a new generation of history museum.

Studies show that younger individuals are more interested in the interactive nature of science museums and react well to digitalized exhibitions. With this information, the German state turns to the Staatliche Museen zu Berlin, the largest museum operator in the city. They are tasked with operating this next generation history museum with three goals central: education, reflection and discussion on history.

Q1
What is the relation between your graduation project topic, your master track (architecture), and your master programme?

Through Zeit&Raum, this graduation project aims to research the development of the museum typology within our rapidly digitalizing world. With our society on an exponential curve of digital development, it raises the question whether large scale public buildings such as museums are still necessary, as most of the artefacts and information in them can be accessed through the internet. This of course has an enormous impact on the discipline of architecture, as at first glance it seems to threaten their need as a professional in the physical build environment. Without a need for public buildings, a whole branch of architecture would seem to disappear. However, this is not the case as research shows that digitalization is not the end of public buildings such as the museum, but rather a tool which can be used in both the planning of the building as well as its execution.

More specific to the graduation project, as part of the digitalization group's strategy to raise digital awareness, visitors are introduced to the topic of the museum through a data lobby. After 'checking in', the visitor is guided along an automated and digitalized route back in time, physically to the top of the building. During this first experience they are introduced to topics such as data collection, exchange and storage. This initial stage of the exhibition can also be seen as digitalized time travel. After travelling up, the visitor is then brought back through the various exhibition spaces, representing different time periods, to the present time. These exhibitions contain both physical artefacts as well as digital spaces, such as the digital engagement spaces which are spaces where the visitor can interact and immerse themselves with history first hand. This is a vital element, as studies suggest that children and youth learn better from experiences rather than conventional methods.

By integrating the storage of data as part of the visitors' experience, the Zeit&Raum project aims to increase both the digital as well as the historical awareness of the general public. Thus, the Zeit&Raum museum investigates the changing nature of the exhibition space and how it impacts the need for the exhibition space in technical aspects such as the shift from purely physical exhibitions to a hybrid or fully digitalized one, which asks for an open floor layout with zoning.

Finally, the digitalization group envisions that the chosen typologies act as a 'data bank' for other typologies within the city of Berlin and for some owned by the same company. For the museum typology this has the effect that the museums in the inner city will not need future additions for an on-site data centre or an expansion of their archiving facilities as the Zeit&Raum museum can fulfil that role as an off-site data storage. This also enables the other museums in that eco system to access data on demand, which in turn enables them to also digitalize their exhibitions, further enhancing their public engagement and future relevance.

REFLECTION PAPER

Q2
How did your research influence your design/ recommendations and how did the design/ recommendations influence your research?

In the Complex Projects graduation studio, the design of the project depends largely on the results of research conducted within the framework and the given criteria, such as the broad location of Berlin and the group lens of Digitalization. Through research, a program, client and site for the museum typology were selected, which would guide the design of the museum after P2.

For the program, it was first established that the museum shall become a highly interactive and immersive historical experience as research showed there was a need for such a museum. Then, through analysis of reference projects a substantial amount of data was gathered which would inform the design of the museum. However, it quickly became apparent that through neutral benchmarking, a logical or useful program could not be drawn up as outliers in the case studies had an over exaggerated effect on the program bar, bringing it to an imbalance of programmatic requirements. This was to be corrected through both averaging out these extremes as well as through programmatic guidelines coming from our group strategy. This led to a program of roughly 20.000m², which would form the basis for the design. This GFA is not practically small, which in the light of digitalization contradicts the initial idea that a digitalized building would end up taking up less space.

Continuing with the client, the selection of the client was primarily meant as a way to guide the project both programmatically as well as maybe architecturally. Within the framework it seemed logical to go with the largest actor in the area of Berlin, the Staatliche Museen, as they would be an all-round client with an established operation and thus expected guiding principles. However, while investigating this client in closer detail they seemingly did not have a clear direction, making the collection of principals for the project more difficult. Eventually, however, their previous commissions still provided sufficient data to inform the project both programmatically as well as some architectural principles.

Then closing the research phase of the graduation with the site selection, a combination of both digitalization based requirements as well as typology specific requirements were introduced for the collection, examination and selection of potential sites for the museum. In this the digitalization took a leading role as the inclusion of a data centre had the most physical requirements. For the more typology specific requirements, the selection was guided by the wishes of the previously selected clients, which in this case was led by the wishes of the city/ state Berlin. This might have not ended up being the best hierarchy as the museum was first and foremost a public building and only secondly a data storage facility. Nonetheless, the selected site managed to fulfil all the requirements needed for a large-scale public development.

However, as the design started to progress after p2, it became clear that the research done did not fully correspond to the direction of the project as the initial concept kept being refined throughout the design stage. This asked for the constant evaluation of prior research and the production of new knowledge in order to develop a functional design.

That opened investigations such as the changing nature of the exhibition spaces, which were analysed for their characteristics with a focus on their adaptability to digitalization. For this, flexibility was shown as a key element in order for the museum to adapt to the changing scene, which ended up being introduced into the design.

Finally, the group strategy was still in development, which had an impact on the program of the building. With the introduction of ‘datatecture’ the project received a set of requirements it had to fulfil, all of which were based on benchmarking done by the group.

Q3
How do you assess the value of your way of working? (approach, used methods & methodology)

The order in which the student goes through the three main subjects; program, client, and site, is determined by the framework of the Complex Projects studio. Furthermore, within these subjects the studio gives a rough outline of the required progress, or products needed per week on which the students work divided in individual, group, and seminar work. However, these are closer to expectations for the benefit of the student rather than hard requirements.

The main research method used during the research phase was the analysis of case studies and the benchmarking of those findings. To produce a program for the museum, some thirty reference projects were investigated divided among their main research purpose such as museums specialised in digital experiences or historical museums.

Secondly, through desk research in the form of historical analysis the evolution of the museum typology was studied to investigate key moments of change to better understand the potential digitalization of the museum.

Thirdly, within the second phase of the graduation studio research by design was employed throughout the various stages of design. For the massing of the building multiple rounds of massing studies were done, constantly evaluating the findings, and adjusting the direction of the of the conducted research. Later, while establishing the floor plans and the facades the same method was used. For these it was key to understand the leading concept of the design. This way the concept and adhering choices should be legible from the design.

Finally, the research conducted in preparation of and during the design aligned with the expected progress of the Complex Projects studio as these were established methods done by students of the same and forgone years. Albeit that not all data was used and multiple stage of research where at times required, the chosen methods of research and design were sufficient for the development of the Zeit&Raum project.

REFLECTION PAPER

Q4
How do you assess the acedemic and societal value, scope and implication of your graduation project, including ethical aspects?

In our complex world, the subject of history is more important than ever as historical education is vital for reflection and the development of critical thinking. However, popularity of the subject has been on decline for years with younger audiences. Historically, field trips to the museum played a significant role in the education of the youth as they provided the pupils with a more hands-on approach to learning. However, also between different types of museums substantial differences exist. Research shows that younger people are interested in the technical and interactive nature of science museums. The lesson learned here is that to improve the engagement, the history museum of the future should introduce an extra layer of experience for the visitor.

By applying digitalization, the Zeit&Raum museum aims to rekindle the young's interest in the (history) museum. This change makes the museum typology change from a one directional educational 'monologue' to an immersive, interactive experience. Aside from the already unprecedented changes digitalization has had on our society and this graduation project's position in it, the museum goes further and tries to be an environment for young people to learn, reflect upon and discuss about history.

Within this goal it is important to remember that we as architects do not determine what history is told or rather, silenced in our designs. Of course, architecture can be linked to various historical events on all sides of the historical spectrum. It is then only important to remember that the museum is a vessel for a message. I chose to go with a neutral yet engaging museum which captures the interest of its visitor through a neutral experience which can be adjusted to the museum's operator's needs.

Changing to the topic of user experience, the designed museum aims to offer a fully inclusive experience to all its visitors, regardless of background or disability. Hence, the museum is fully accessible by ramps and tries not to separate the visitor stream from abled and disabled.

Finally, a trend has emerged of museum typologies in which the visitor is enabled to get a much more in-depth look into the operation of the museum. These so-called 'open museums or archives' allow the visitor to see parts of the back of house such as the archiving facilities, which would normally be a private program. By doing so, the visitor learns more on their trip through experience, which further enhances the effect of their visit. Thus, a new balance in the public private division of the program is required to which the Zeit&Raum museum tries to open as much of the narratively interesting program as possible, especially on the data side of the project.

Q5
How do you assess the value of the transferability of your project results?

To come to the final design, decisions were made of which some where specific and related to context or the situation and on others referred to the theme and/ or were specific to the assignment.

On the topic of digitalization, the digitalization group devised a strategy in which a data storage facility would be implemented into the public buildings of Berlin. This asks for a set of requirements, which would need to work on all the nine typologies within the Complex Projects studio, making it generally applicable to most if not all public buildings.

However, the Zeit&Raum projects integration of data into the visitor's experience is a more specific addition to the concept, which would be more difficult to adapt to other museums, let alone other typologies. For this an educational typology is needed, which could both spare the floor area needed for its integration as well as the logic behind the integration. However, a more indirect integration could work, albeit less efficient in engaging the public.

Looking into the typological development of the museum, the lessons learned in the ambition to create a fully accessible building for every type of visitor can of course be applied to other public institutions. It is not in their benefit as a lower general threshold could increase its potential visitor pool, thus stimulating engagement with the public. Furthermore, the shift of educational museums from a sequential layout to an open one has the effect that the programming becomes freer. This increases the adaptability, which is of benefit to other educational institutions as well.

More specifically, however, the Zeit&Raum employs a layout specifically designed to enhance the concept of time travel and the visitor's experiences surrounding it. Elements such as the vertically automated path through the data spaces and the spiral surrounded by narrowing exhibition spaces come to mind. As these are designed for the Zeit&Raum, they may not find use outside of this concept.

Finally, also important to mention is the far-reaching ambition to include elements of the site's former use in the form of preservation. For this, parts of four oil tanks were integrated as key elements on the ground floor, although they were not protected in any way. By preserving them, the museum, which historically plays a key role in cultural preservation, can refer to onsite history in a physical way. The museum is then organised in such a way that the tanks are allowed to distinguish themselves through difference in mass and materiality, highlighting their presence and importance. Although preservation is a common theme in contemporary architecture, it requires specific conditions in which the preservation of a non-monument is to the benefit of the building.

complex CP 10 projects