A FUTURE LIBRARY
- STORAGE OF IDEAS

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How to translate the concept
of storage of ideas into
a collective building of
knowledge and information?

Keyword:
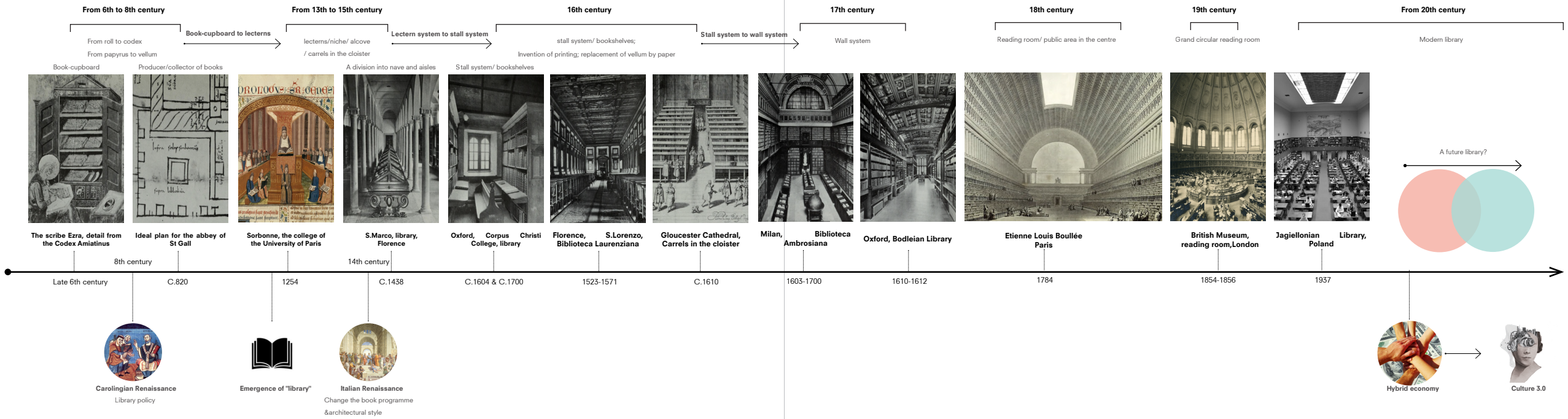Storage of ideas, Knowledge sharing,
Creativity, Efficiency

In the post-industrial city, storage is not physical and immobile. The increasing digital storage flows, such as data, knowledge, and information, play a vital role in determining the physical parameters in cities. Ideas, as the collective term for knowledge and information, can be stored in the digital medium. This paper addresses the topic of storage of ideas as the collective form of knowledge and information. The development of digital and dynamic storage generates new typologies, while challenging other existing typologies to transform their scope and services. In particular, the public library, traditionally devoted to storing ideas in the form of passive knowledge, is now confronted with a completely new way of producing knowledge available to people.

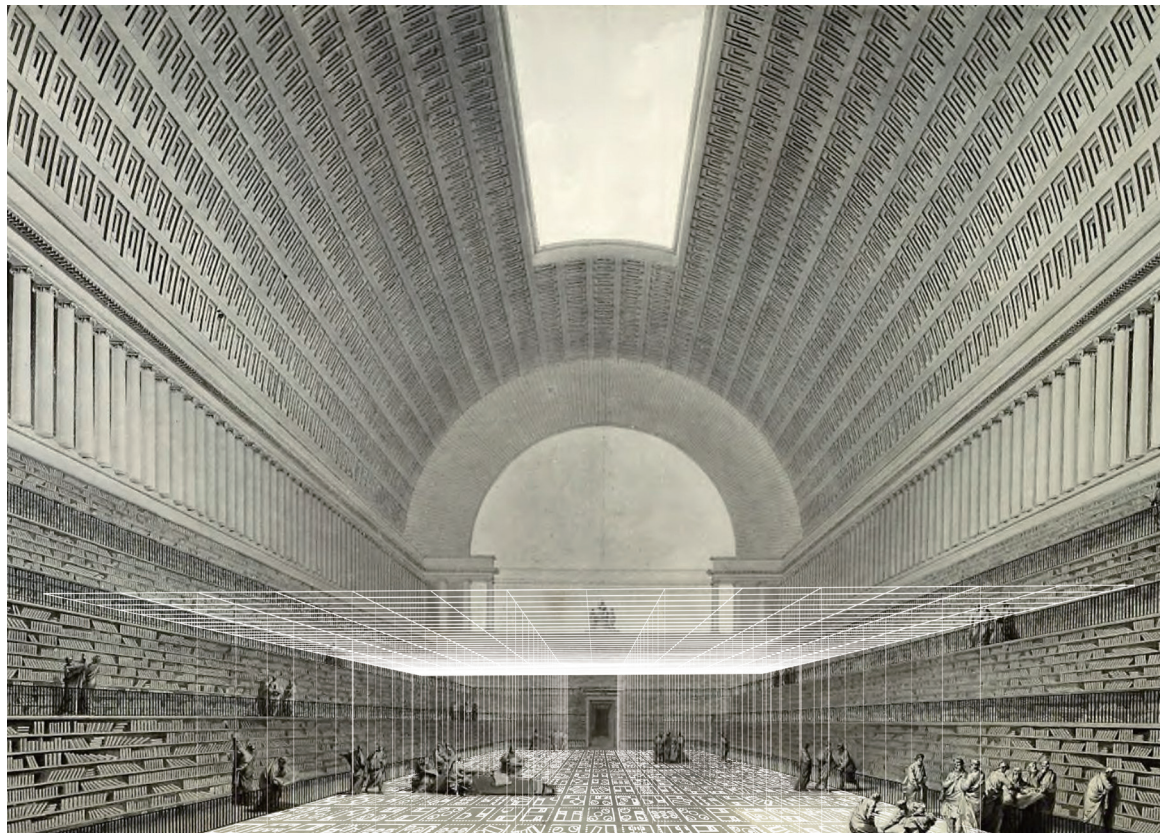The personal contribution is to conceptualize a future library as a modern panopticon, particularly, the visibility in panopticon as the metaphor of efficient knowledge sharing creation activities. To achieve this, the research question is "How to translate the concept of storage of ideas into a collective building of knowledge and information?"

The answers to the research questions are derived from the relevant building typologies research, which includes cultural institutions: libraries, community centres; storage facilities: datacenter, distribution center; disciplinary institutions: panopticon.

South of Rotterdam as the testbed offers the challenges and opportunities for the project of storage of ideas. A future library's specific design brief is constructed by analyzing three aspects, including the creative city strategy, the lack of cultural institutions, and the existing bottom-up creative industries.

From 6th to 8th century | From 13th to 15th century | 16th century | 17th century | 18th century | 19th century | From 20th century

From roll to codex
From papyrus to vellum

Book-cupboard to lecterns

lecterns/niche/ alcove / carrels in the cloister

Lectern system to stall system

stall system/ bookshelves;
Invention of printing; replacement of vellum by paper

Stall system to wall system

Wall system

Reading room/ public area in the centre

Grand circular reading room

Modern library

Book-cupboard

Producer/collector of books

A division into nave and aisles

Stall system/ bookshelves

A future library?

The scribe Ezra, detail from the Codex Amiatinus

Ideal plan for the abbey of St Gall

Sorbonne, the college of the University of Paris

S.Marco, library, Florence

Oxford, Corpus Christi College, library

Florence, S.Lorenzo, Biblioteca Laurenziana

Gloucester Cathedral, Carrels in the cloister

Milan, Biblioteca Ambrosiana

Oxford, Bodleian Library

Etienne Louis Boullée Paris

British Museum, reading room,London

Jagiellonian Library, Poland

8th century | 14th century

Late 6th century | C.820 | 1254 | C.1438 | C.1604 & C.1700 | 1523-1571 | C.1610 | 1603-1700 | 1610-1612 | 1784 | 1854-1856 | 1937

Carolingian Renaissance
Library policy

Emergence of "library"

Italian Renaissance
Change the book programme
&architectural style

Hybrid economy → **Culture 3.0**

Collage, Etienne Louis Boullée, 1728–1799

The research topic "migration of ideas" is reflected in the observation and consideration of the migration of libraries and migration of storage of ideas.

1.1 Migration of libraries

Libraries have evolved from a passive repository of knowledge to a pro-active place for cultural activities. The history of libraries is also the development of knowledge storage(above), from Book-cupboard to bookshelves to wall system to store books (Pevsner 1976). Since storage becomes increasingly digitalized and dynamic, the form of knowledge has changed from manuscripts and books to information and data. The design of libraries echoes the trend of digitalized knowledge. The Idea Store in London creates a digitally inclusive environment for learning and creating, rather than the shelf-based spaces in traditional libraries. In the knowledge-based society, libraries have the great potential to become the future centralized cultural institutions as the platform for the storage of ideas.

1.2 Migration of storage of ideas

Migration of storage of ideas is derived from the migration of storage. Firstly, in post-industrial cities. Physical storage does not accumulate in the depositories instead as a flow due to the development of the information management system (Lyster,2012). For example, the whole storage network controlled by the logistics companies (FedEx, DHL) has infiltrated every corner of our life because of the promotion of information management systems. (Fig 2.1)

Fig 2.1: FedEx World Hub(Left); Drop box(Right)

Secondly, storage becomes increasingly digitalized, multi-layered, and dynamic. storage flows have developed from physical space to virtual interface. For example, in

3

4

South Korea, Tesco's Homeplus has installed the first virtual shopping aisles in a Seoul subway station. Using a smartphone and a QR code, customers order food from a vertical interface when they commute to and from work (Martin& Kimberley& Courtney ,2015). The form of food has developed from singular physical storage to hybrid storage with physical entities and the digital icon on the screen.(Fig 2.2)

Fig 2.2: Tesco Homeplus virtual storefront, Seoul, South Korea, 2011

1.3 Relationship between the migration of libraries and migration of storage of ideas

On the one hand, the migration of storage of ideas has challenged modern libraries and driven the migration of libraries. On the other hand, libraries as physcial-digital hybridity of knowledges also facilitate the migration of idea storage. Specifically, a future library acts as the collective form of the storage of ideas.

1.4 Literature review

Some related cultural theories and practice of libraries have been theorized and exemplified by Architects and Theorists.

In the context of "Culture 3.0", the new library is a platform for creating ideas and embedding active cultural participation. Culture 3.0 (Sacco 2011) characterized the transformation of cultural audiences into cultural practicers, while Culture 1.0 revolves around the concept of patronage and Cultural 2.0 can be seen as a new relationship between cultural production and generation of economic value. A shift from Culture 2.0 to Culture 3.0 promotes active cultural participation. Active cultural participation refers to individuals being motivated to engage in cultural activities, rather than absorbing knowledge passively. The emergence of the 'Performative space' in libraries echoes the active cultural participation. The four space model for the public library is composed of Inspiration space, Learning space, Performative space, and Meeting space. (Jochumsen&Hvenegaard Rasmussen&Skot-Hansen,2012). The 'Performative space' has been added to the more traditional spaces for proactive knowledge creation(Jochumsen&Hvenegaard Rasmussen&Skot-Hansen,2017). Specifically, the performative space, composed of creative space and innovation space, is a platform for mediation, supporting publishing and distribution of the users' products, and providing stages for their activities.

1.5 Challenges

Two challenge needs to be considered when redeveloping the future library typology. Firstly, in the age of increasingly digitalized and dynamic storage, libraries develop from the physical storage place to the physical-digital hybridity. The French National Library designed by architect Étienne-Louis Boullée, was the precursor of libraries representing the changing relationships between stored knowledge (books) and flowing knowledge (discussion& communication). Surrounded by the book shelves, readers in the central public forum are free to communicate with others. Knowledge became proactive in terms of information during the conversation. The modern library's typology is the hybrid public building which is composed of a traditional library, education center, gallery, labs, Makerspace, information centre. For example, LocHal in Tilburg(Fig 2.3), Rozet in Arnhem(Fig 2.5), Dokk1 in Denmark(Fig 2.4). The trend of the physical-digital hybridity challenges the programs and the spatial relationship of the future library. Some subquestions need to be solved in the next chapter: what is the relationship between
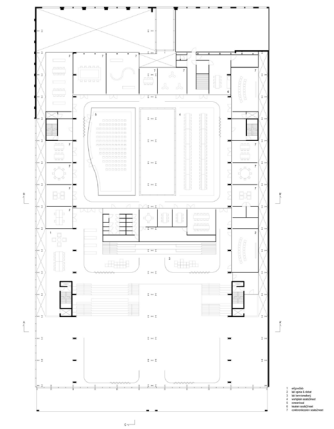

Fig 2.3: LocHal in Tilburg
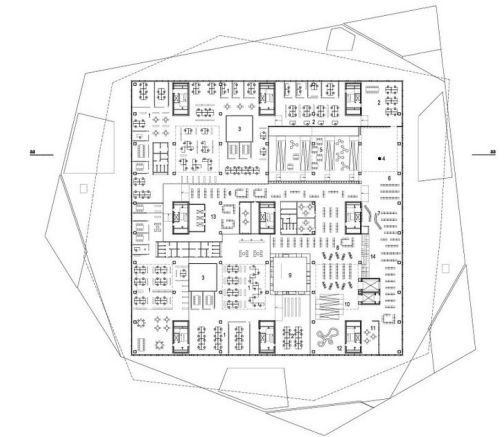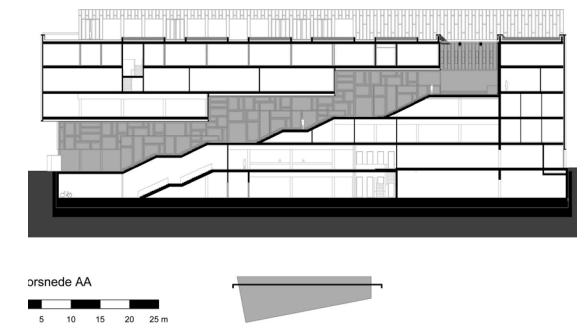

Fig 2.4: Dokk1 in Denmark

Fig 2.5: Rozet in Arnhem

the hybrid program in different libraries; what specific spatial relationships can be summarized from the spatial arrangement of a future library?"

Moreover, facing the challenges of the hybrid economy and the emergence of Culture 3.0, libraries become the hub of active cultural engagement, especially knowledge sharing and creative activities. Libraries provide the creative enterprise with entrepreneurial opportunities and business development information. For example, libraries in the United States, According to the 2013 ALA/University of Maryland Digital Inclusion Survey, 95% of public libraries have economic/workforce programs. (Carlo Bertot& Real& Lee& McDermott & Jaeger 2015). However, there has been a declining trend in the efficiency of creativity over the last ten years, particularly in the creative entrepreneur business. According to the IPA data of creativity, there was a 69.2% collapse in creativity efficiency from 2008 to 2018 in creative campaigns. The introduction of new economic and workforce programs in libraries does not seem to be enough to reverse the reduction in innovation efficiency. The challenges and opportunities of a future library as the hub of active cultural engagement bring up another subquestion "what spatial character of a future library can contribute to efficient knowledge sharing and creativity?"

2.1 What is the relationship between the hybrid program in different libraries?

This chapter addresses the hybrid program of a future library by researching libraries and storage facilities' typologies. Four most relevant libraries and five storage facilities are selected as case studies. On the one hand, for the libraries' program research, the program is classified according to the public library's four-space model (Jochumsen2012). On the other hand, storage facilities, including distribution centers and digital storage facilities, provide the reference for the internal proportions of storage space in designing the libraries. The percentage within

the library storage space derives from the ratio among storage space and human space in storage facilities.

Several considerations and observations are reflected in the process of deducing the benchmarking of the program.

There is a gap between the proportions of four spaces in libraries because the concept and the target group of the chosen libraries are different. (Fig 2.6) For example, the Dokk1 library in Denmark aims to provide a platform for library users, citizens, and creative enterprise. So there is a high percentage of space dedicated to citizen engagement and the rental office. The Rozet in Arnhem, on the other hand, is the hybrid building with heritage centre, art centre, and community college. An interior gallery street(Inspiration space) intersects all levels of the building, which takes up to 30% of the building area.
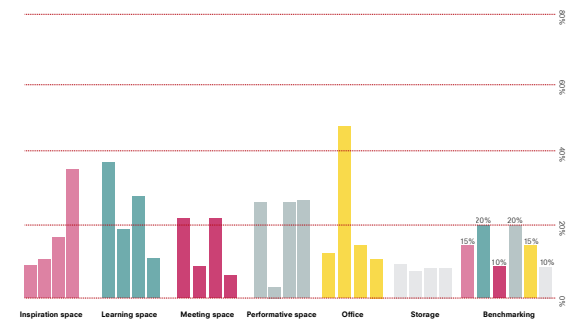

Fig 2.6: Program benchmarking

The performative space is defined differently in accordance with the context and strategy of libraries. Compared with learning space and meeting space, the design strategy of the performative space seems not to be contemplated, in terms of program type, accessibility, etc. For example, the concept of the LocHal library concentrates on the Makerspace. The performative space is characterized as different knowledge labs: Digital Lab, Youth Lab, Knowledge making Lab, Writing Lab, Food Labs, etc. Some of the knowledge labs are embedded in the library lobby space with good visibility and accessibility. Seattle central library, as an iconic city landmark, redefines the library as

the information centre where all hybrid forms of media are displayed. Performative space integrates into the media platform spaces for work, interaction, and plays.

2.2 What specific spatial relationships can be summarized from the spatial arrangement of a future library?

This chapter addresses a future library's spatial scheme by focusing on three relationships among different hybrid programs- the relationship between traditional library programs and the new programs, the relationship between performative space and meeting space, the relationship between library and storage space.

The relationship between traditional library programs and new programs is shown in the (Fig 2.7). The traditional library programs, composed of book stacks and reading areas, integrate into the hybrid library program. For example, in the LocHal library, the books stack and the reading room are hidden under an open stage with a performative space above. In the Rozet , traditional library programs become part of the sequence of the interior gallery street. In the Seattle central library, printed books as one of the manifestations of media, coexist with other media clusters, including video, music, and database.
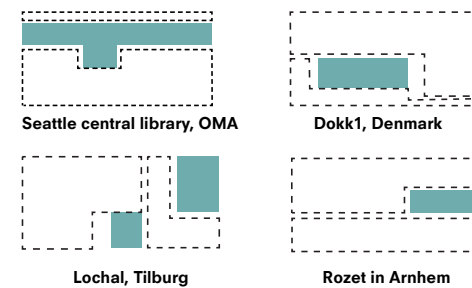

Seattle central library, OMA   **Dokk1, Denmark**

Lochal, Tilburg   **Rozet in Arnhem**

Fig 2.7: Traditional program and new program

The relationship between performative space and meeting space is shown in the(Fig 2.8). The meeting space acts as a medium for connecting different scales of performative space. For example, in the LocHal library, meeting space as the buffer zone bridges

performative space on the open stage and knowledge labs in the closed setting. In the Seattle central library, performative space and meeting space integrate in the mixed chamber. Meeting space creates a vertical visual connection between different scales of performative space.
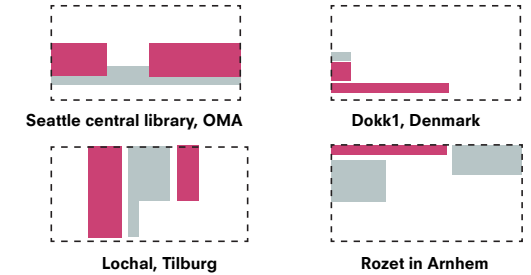

Seattle central library, OMA   **Dokk1, Denmark**

Lochal, Tilburg   **Rozet in Arnhem**

Fig 2.8: Performative space and meeting space

The relationship between library and storage space is shown in the (Fig 2.9). Physical and digital storage are dissociated from the original location with the expansion of knowledge. Excess storage is transported to an efficient storage space with weak accessibility, which shares the same typology as the storage facility. For example, in the Dokk1 library, the books storage area is the enclosed area with a vertical connection with the other floor. Besides, the development of technology is challenging physical storage to transform its form and location. With the introduction of the books sorting machine, books are stored in the basement in the form of a package, rather than being visible in the public.(Fig 2.10)
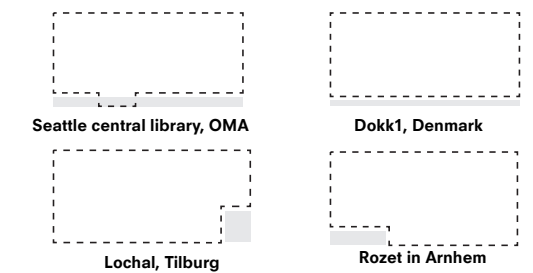

Seattle central library, OMA   **Dokk1, Denmark**

Lochal, Tilburg   **Rozet in Arnhem**

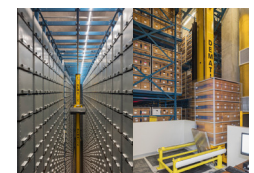Fig 2.9: storage space and other program

Fig 2.10: Storage of books, Charles Library at Temple University

2.3 What spatial character of a future library can contribute to efficient knowledge sharing and Idea creations?

The spaces for knowledge sharing and idea creations are distributed in libraries. In order to research the spatial character of this type of space, this chapter selects the performative space in Dutch libraries, particularly, the LocHal library in Tilburg. The performative space in public libraries is categorized as a creation space and innovation space. Creation space represents the artistic creative space that provides users with music instruments and recording equipment to stage events, while innovation space represents the technological hub in terms of Makerspaces and hackerspaces (Jochumsen& Skot-Hansen& Hvenegaard Rasmussen 2017).

This chapter addresses the spatial characters of eight performative spaces in LocHal library, which are mapping in the axonometric

drawing of performative space. The following spatial aspects need to be considered: the general spatial characteristics: size, open&close, accessibility; the configuration of the performative space; the visibility in the Knowledge-sharing space.

The general spatial characteristics: size, open&close, accessibility are illustrated in the (Fig 2.11). The eight different spaces vary from 35 m2 to 315 m2 with an average size of 123 m2. The smaller space (0-80m2) is configured in the closed environment while the larger one(80m2-315m2) embeds into the library. The accessibility of large performative space is good, particularly the space for Lab acquaintance located in the open stage. However, most of the smaller performative space(Game lab, Word lab) is distributed under the open stage, which is not visible from the public routing.

The configuration of the performative space influences knowledge production activities. On the one hand, the performative space with the closed configuration, such as Word Lab,

Fig 2.12: The configuration of the performative space

Fig 2.11: General spatial characteristics: size, open&close, accessibility

Model-making Lab, Game Lab, Food Lab, Digital Lab, is separated from the library's whole public space. The room's furniture and partition wall defines users' behaviour in two general groups: learning and communicating (Fig 2.12). The smaller enclosed spaces are designed primarily for Learning activities, while communicating activities occur in the central space. For example, the chamber in the corner of the Game Lab provides users with an immersive environment. The spaces for the communicating activities are distributed in the center of the room with a table or stage, especially the Model-making Lab and Game Lab. On the other hand, the performative space with the open configuration integrates into the library environment. The space for communicating activities dominates the open configuration with increasingly spatial flexibility. In particular, the Lab space on the open stage, by moving the seats on the open stage randomly, allows lab users to communicate freely.

The visibility plays a vital role in facilitating the efficiency of the knowledge-sharing and idea creations. In the analysis of the eight performative spaces' visibility, the general

spatial strategy of the communicative space is to create the organizational centre to facilitate sharing and creating knowledge. Moreover, in the LocHal library in Tilburg, visibility also reflects the spatial strategy of performative space. (Fig 2.13) The moveable textile curtains define four dominant knowledge-sharing spaces. On the one hand, each space has the organization center for discussion. On the other hand, each space integrates into the lobby to ensure the visibility between different knowledge-sharing groups.
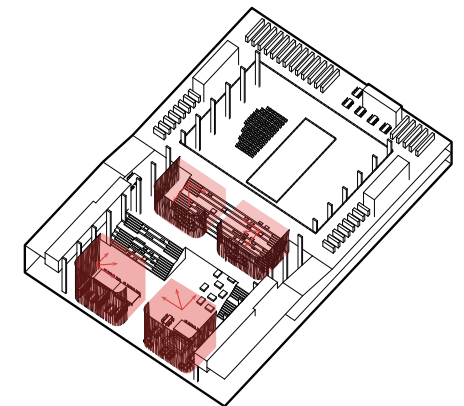

Fig 2.13: Visibility in the LocHal, Tilburg

3.1 Reflection

This chapter addresses the observations and considerations on the aspects reflected through the programmatic drawing and data comparison.

1. Storage of ideas are not only physical and immobile but also increasingly digital and dynamic. The proportion of physical storage of ideas is becoming smaller, while the proportion of digital form of ideas increases. Meanwhile, digital storage of ideas has a different manifestation in libraries, particularly different digital media as the carriers of storage of ideas. Storage of ideas as a knowledge flow becomes increasingly dynamic and multi-layered. Ideas can be not only stored in the digital depository but also shared through active cultural activities. The development of digital storage of ideas is just beginning and has a great potential to become the primary form of knowledge in the future library.

Storage of ideas become a way of communication that brings different background of people together, rather than the passvie and immobile knowledge. When linking the sites, It is very interesting to reflect on the impact of evolving storage interpretation on the south of Rotterdam. Kop Van Zuid has developed from the port of Rotterdam to a diverse multi-functional area . The remaining storage facilities, for example, Fenix warehouse, have been given a new definition to adapt to the modern community. However, storage facilities, as products of the industrial past, are not only projects to be transformed, but also have the potential to develop the concept of storage and thus give back to the society. If the storage of ideas is the starting point for public libraries, what are the opportunities and challenges for a future library in the south of Rotterdam? What will it bring to the local community?

2. The physical-digital hybrid form of knowledge is represented in the four-space model of the library. However, there is no common ground of the physical and digital form of knowledge in different libraries,

in terms of definitions and proportions. For example, in Performative spaces and Inspiration spaces, ideas can be generated by physical medium, as in the case of paintings in inspiration spaces, or leverage language as a vehicle, as in discussions or interactions in knowledge labs. Moreover, each of the four spaces in libraries has an approximate dominant form of storage of ideas. In the inspiration space, ideas mostly exist in physical forms, in particular the artistic product in the exhibition. In the performative space and meeting space, ideas as the digital forms are disseminated through conversation and discussion in lounge areas or knowledge labs.

In the spatial arrangement within the four spaces, the project should not only takes into consideration the spatial qualities required for the dominant form of idea storage but also flexibly integrates other forms of storage of ideas.

3. Visibility exists in the space of efficient knowledge sharing and idea creation, in particular, the Organization centre inside the knowledge-sharing group.

Panopticon, as the metaphor of the organization centre conceptualizes the visibility in the space of Knowledge-sharing and idea creations. (Foucault 1977) uses Jeremy Bentham's prison model of the panopticon as a metaphor for passive surveillance's disciplinary effects. (Leclercq-Vandelannoitte&Issac&Kalika 2014) proposed several developments of the metaphor of the panopticon: 1) From a subdued prisoner to a voluntary participant 2) From unilateral constraints to dialectics of control and autonomy. The relationship between Knowledge Sharers and Creators represents the development of the metaphor of the panopticon. In contrast to passive surveillance in the panopticon, the organizational centre in sharing and creating knowledge promotes active participation. For example, in the online meeting, one or two moderators will designate the topic of the session for discussion. Simultaneously, others actively participate in the discussion,

hoping to gain others' recognition on the topic and become the new moderators.

3.2 Contribution & Application

To put it further, the personal contribution is to conceptualize the libraries as a modern panopticon due to the fact that knowledge sharing creation activities are distributed in a future library.

Several considerations and observations lead to the concept of the panopticon. Firstly, users in the libraries are subjected to a field of visibility. In the Bentham's panopticon(Bentham 2011), the prisoner believes that they are watched by the guard in the inspection power whether the inspector is present or not. The visibility also comes from the library itself instead of the one person in a specific location. Readers always keep quiet because of the "shushing librarian" or the sight from other readers.

Moreover, " unconscious surveillance" in the library promotes the efficiency of learning and sharing knowledge. Some visible elements in the library enable people to feel under surveillance and concentrate on learning and producing knowledge. On the one hand, the surveiliance originates from the library itself, including organized bookshelves, library regulation. On the other hand, it also comes

from other readers sitting next to you.

Finally, centrality - The spatial arrangement of knowledge-sharing spaces evolves from mono-centric space to multi-centric space.

In the analysis of the visibility of LocHal in Tilburg (Fig 2.9), four knowledge-sharing units with the organizational centre in each are distributed in the open stage. The distributed centrality of knowledge-sharing space echoes Foucault's explanation of panopticon. "Power (centrality) has its principle not so much in a person as in a certain concerted distribution of bodies, surfaces, lights, gazes; in an arrangement whose internal mechanisms produce the relation in which individuals are caught up"(Foucault 1977). The furniture, lights, and atmosphere permeate the the different functional areas of the library, providing the platform for multi-centric knowledge-sharing activities. (Fig 3.1)

The panopticon as a metaphor becomes the toolbox of an efficient library for knowledge creation while promoting active ideas creation. Such a shift challenges the traditional spatial arrangement of libraries. Meanwhile, knowledge as the physical-digital hybridity into different library programs is both an inheritance and an innovation of the previous knowledge storage forms in libraries.
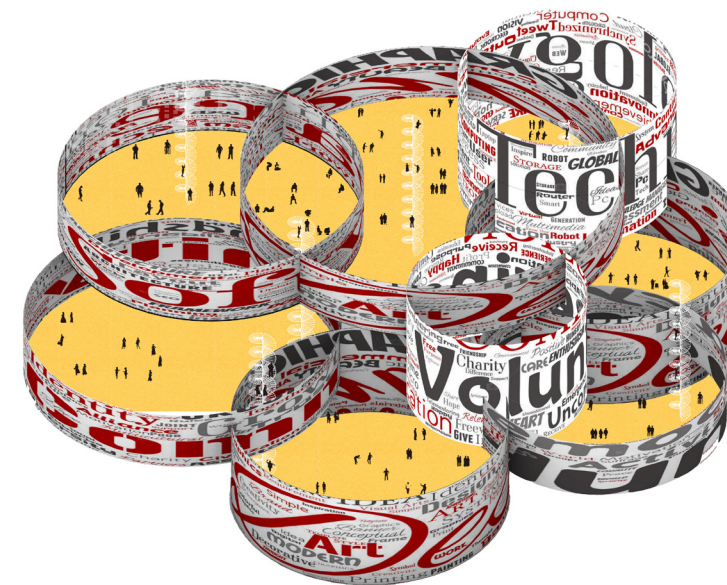

Fig 3.1: Panopticon as the

metaphor of library, collage

Rotterdam as the testbed

1 In the case of south of Rotterdam, a future library is gaining prominence due to the proposal of the creative city strategy, the lack of cultural institutions, and the existing bottom-up creative industries.

●Creative city strategy:
The Economic Vision Rotterdam(City of Rotterdam Regional Steering Committee 2009) embraced the Rotterdam as "The Creative City. The creative cluster's extension was one of the emphases in the city plan to create more jobs, which encompasses architecture, technical and graphic design, enterprises, and new media. From 2006-2010, the number of locations of creative entrepreneurs in Rotterdam increased 37.6% while the growth of the number of people working in the creative sector amounted to 10.2%.

● Lack of cultural institutions:

It is noticeable that the south of Rotterdam lacks cultural institutions. Compared to the high density of cultural institutions in the north of Rotterdam, south of Rotterdam is mainly composed of residences with limited cultural institutions. In particular, public libraries are mostly distributed in the north of the Rotterdam. No public libraries are built in Kop Van Zuid.

●Existing bottom-up creative industries:
Some of the small creative industries that address bottom-up culture are distributed in clusters, such as Freehouse, Creative factory, EMI, Wij Zijn, Jinc, Rotterdamse Munt. In particular, Built in 2008, Freehouse in Afrikanderwijk bridges the gap between designers and neighborhood residents by nurturing the creative talents of local residents. Moreover, the Creative factory in Maashaven , artists collaborate with local residents to develop creative business. Forty-eight businesses in the Creative factory are composed of five sectors: Design, Fashion, Music& Events, Media, and Business.

Site in relation with surroundings
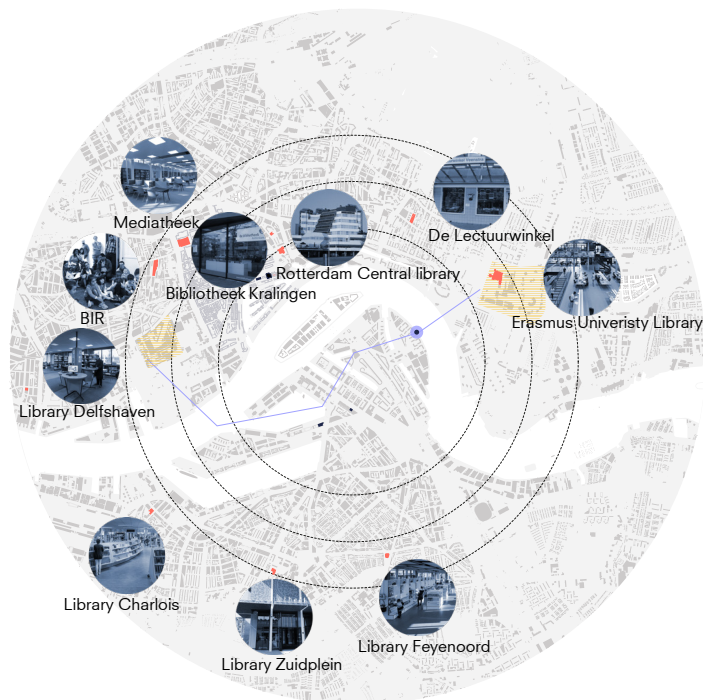
Legend:
- Proposed cablecar system
- Erasmus university &Erasmus MC
- Public library
- Bottom-up activism
- Site
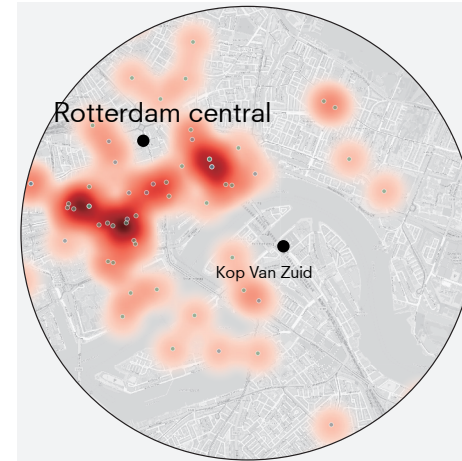
Cultural Institutions(XL Map)

Cultural Institutions (L Map)

● Cultural Institutions

Cultural institutions, by author,data source: Lisa data_ Zuid Holland_2019
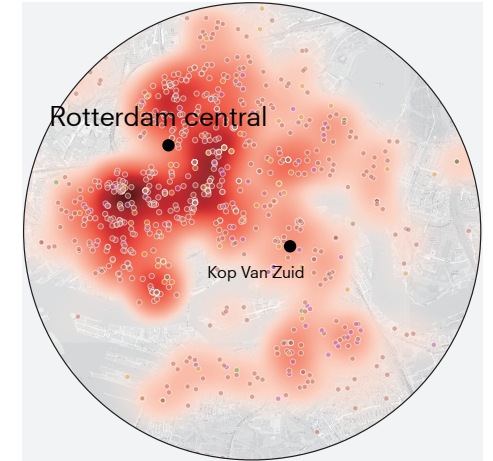
Creative industries(XL Map)
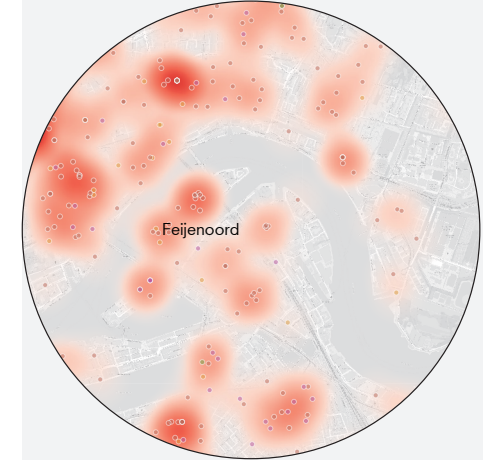
Neighbourhood creative industries(L Map)

- Production and distribution of video & audio
- Production and distribution of Image
- Book publishing

Creative industries, by author, data source: Lisa data_ Zuid Holland_2019

2 The relation to the site creates the local characteristics of the library. Several site conditions are relating to the typological research and play a vital role in determining the library design: the diverse demographic background; the relation to the Mass river; the connection to the proposed cable car system;

●The diverse demographic background:
Kop Van Zuid features diverse ethnicities in a different neighbourhood, in particular, Kop Van Feijenoord is composed of 77% non-western immigrants and 16% western immigrants. The diverse cultural background echoes the trend of multi-centric knowledge-sharing spaces in the library. On the premise that people of the same cultural background can share a leanring unit with an organizational centre, the project aims to ensure that library users with different cultural backgrounds can communicate by organically combining learning units of different scales.

●The relation to the Mass river:

Kop Van Zuid is characterized by an abundance of water resources, with 12 kilometers of waterfront and 37% of the total area covered by water. The library locates in the eye catchy waterfront of Kop van Feijenoord. Iconic programs such as the Open Stage, the Knowledge Lab, and the Makerspace are spread out on the river-facing side of the library, displaying across the river to Rotterdam's north side. Moreover, The library's ground floor is elevated to create an urban plaza that draws people to the waterfront, which ensure the north to south connection along the waterfront.

●The relation to the proposed cable car system:
The proposed cable car system is shown in the below, connecting Erasmus Medical Center and Erasmus University. The future library has a great potential becoming the knowledge hub between two main educational facilities. The library design provides flexible programs on the top floor for the educated users and citizens accessible by cable cars.
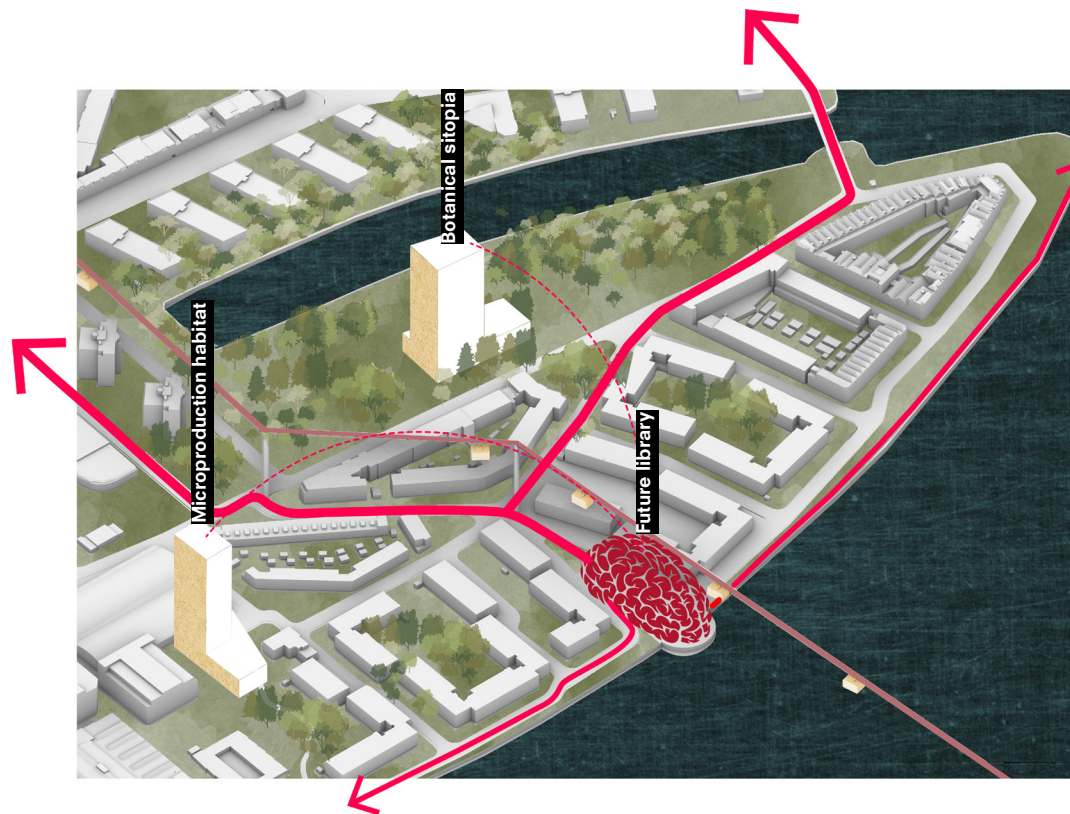
Project vision, relation to the site, collage
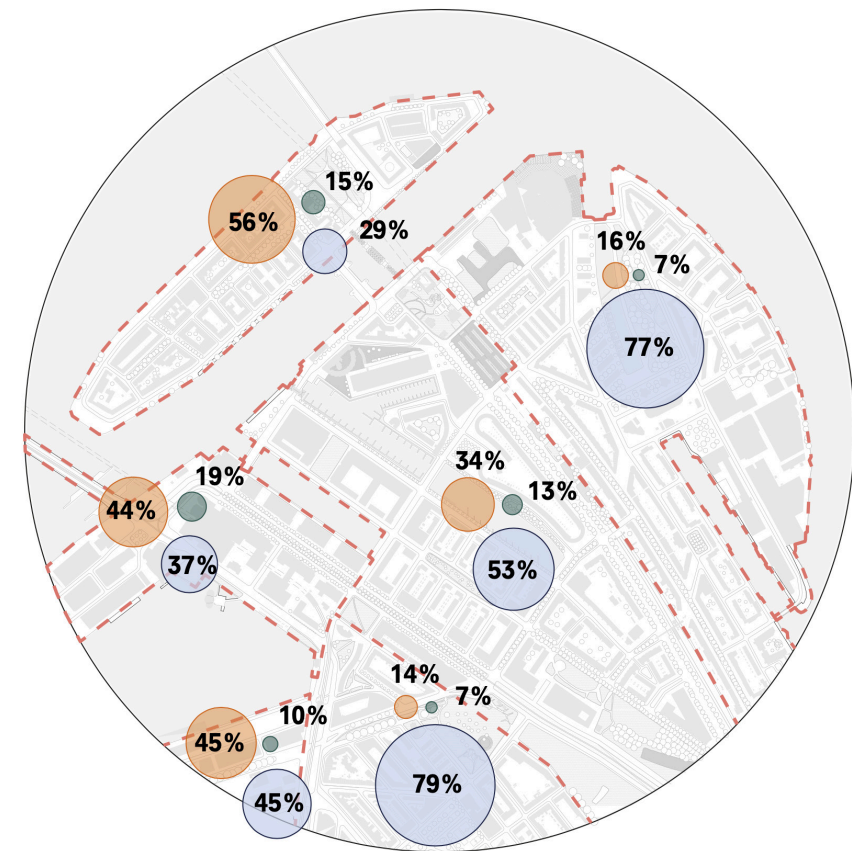
Non western   Western   Dutch

Rotterdam Zuid's diverse cultural background

Public Hall   Makerspace   Idea store

Learning   Open stage   Rental office

Program arrangement in 3D

Open water view of the city plaza

3 In consideration of the existing situation in the south of Rotterdam, the specific design brief and design ambition are needed to reflect the local character of a future library.

● The design ambition is to build a future library as the collective form of the storage of ideas while promoting community cohesion in Kop Van Feijenoord.

● The target group of the library is the local community residents and the creative entrepreneurs in Rotterdam.

● The client of the library is the City of Rotterdam and Centraal Biblioteek.

● The program ambition of the library is" based on the understanding and interpretation of the four space model of libraries, the project reconstructs the composition of the four dominant spaces and the relationship between the different spaces by utilizing storage of ideas as a clue, thus branding a future library as the collective form of storage of ideas

● The optimal library volume: Kop Van

Feijenoord's FSI is between 0.8 and 1.0, while the expected FSI in the Group's vision is between 4.0 and 5.0, as in Paris. Meanwhile, Due to the skyline of the shoreline and the constraint of the site dimension, the FSI and GFA of the library is 4 and 10000m2.

● Program benchmarking: In consideration of typological research, site situation, and design ambition, the proportion of leased office and performance space has increased by 10% with respectively, compared to the average. The increasing rental and performative spaces are provided for small creative industries and local residents in the south of Rotterdam.

● Spatial arrangement scheme: The spatial arrangement scheme comprises six hybrid programmatic clusters: Reading zone, rental office/ office, makerspace, idea store, citizen engagement, and urban plaza. Each hybrid cluster is interconnected through the central public hall as the transportation hub. Different forms of knowledge are integrated into each programmatic clusters instead of separating into different zones.

Site constraint

The optimal library volume

Spatial arrangement scheme

Skyline analysis

Benchmarking chart (top)

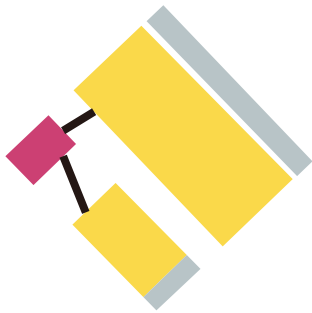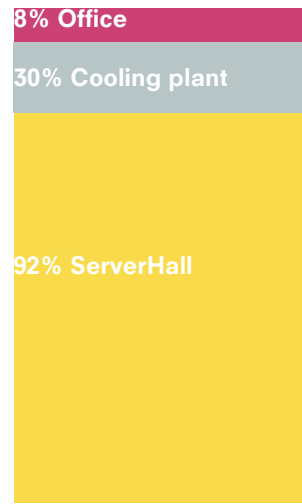|	100%	80%	60%	40%	20%	0%
Seattle central library, OMA						
Dokk1, Denmark						
Lochal, Tilburg						
Cultural Center in Arnhem						
Average	10% Storage	15% Office	20% Performative	10% Meeting	20% Learning	15% Inspiration
Benchmarking	10% Storage	25% Office	30% Performative	10% Meeting	10% Learning	5%

Program breakdown (left bar — Area: 25000m²)

- 5% Inspiration
- 10% Learning
- 10% Meeting
- 30% Performative
- 25% Office
- 10% Storage

(scale: 20%, 40%, 60%, 80%, 100%)

Program list (middle)

- Exhibition/ 1250m²
- Book Stack/ 500m²
- Reading Room/2500m²
- Kids Reading Room/500m²
- Cafe/ 400m²
- Information Center/ 400m²
- Salon/ 450m²
- Civic engagement/ 1250m²
- Studio/ 1750 m²
- Workshop/ 2250m²
- Makerspace/3500m²
- Office/ 1250 m²
- Rental office/ 5000 m²
- Storage of books/1000m²
- Digital Storage/1000m²
- Cooling system/ 500m²

Program (right)

- Office
- Reading room
- Kids Reading Room
- Makerspace
- Rental Office
- Idea Store
- Citizen engagement
- Urban Plaza

Program benchmarking

19

Typology research

Library
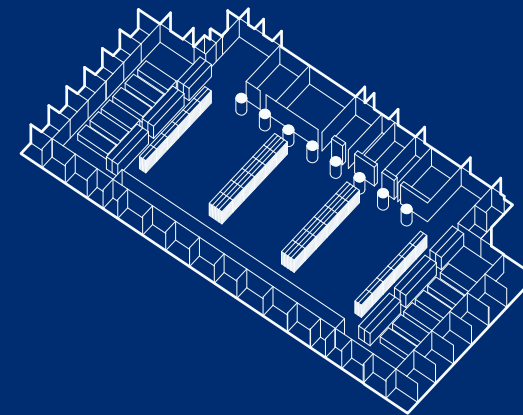
Storage facilities

Panopticon

20

Seattle central library, OMA

6% Inspiration space

37% Learning space

13% Meeting space

23% Performative space

10% Office

9% Storage

38300 m²

Dokk1, Denmark

9% Inspiration space

16% Learning space

7% Meeting space

1% Performative space

43% office

2% Storage
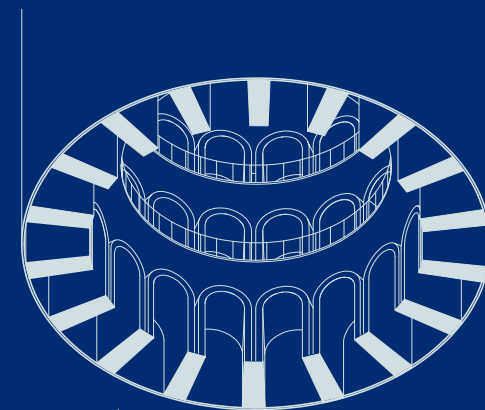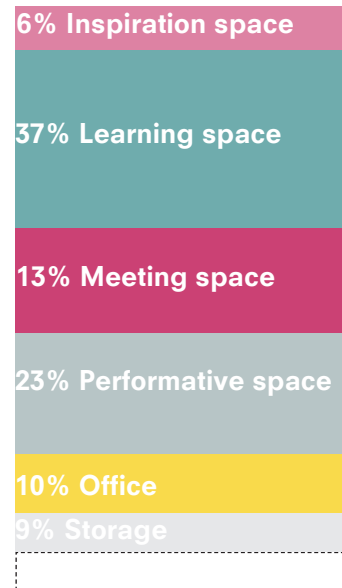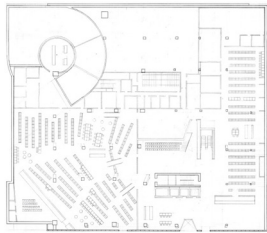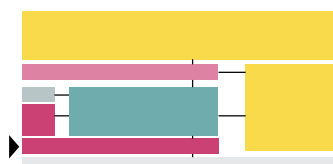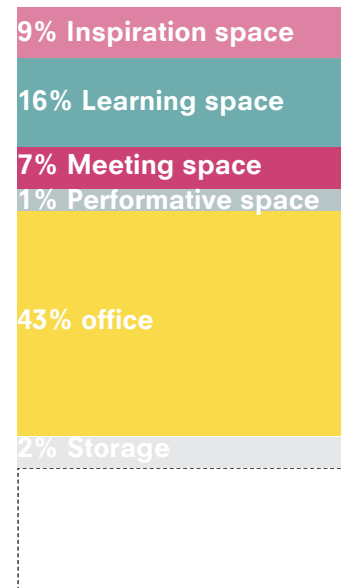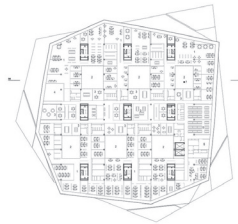
28,000 m²

Lochal, Tilburg

12% Inspiration space

20% Learning space

15% meeting space

23% Performative space

11% Office

7% Storage
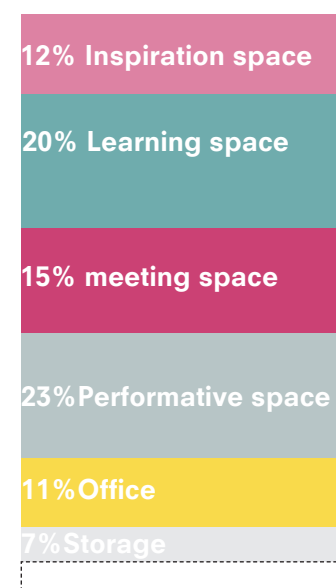
11,200 m²

Cultural Center in Arnhem

33% Inspiration space

8% Learning space

2% Meeting space

24% Performative space
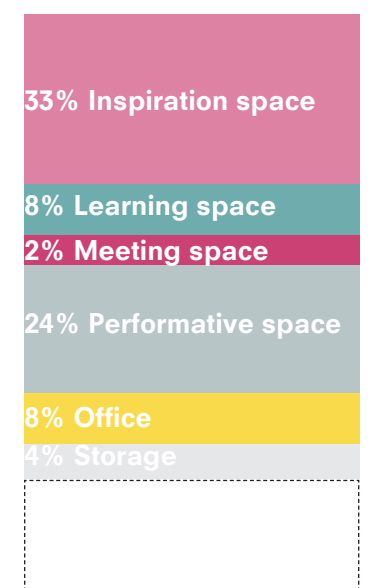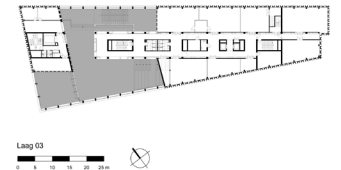
8% Office

4% Storage

12,000 m²

Datacenter AM4, Amsterdam

8% Office

30% Cooling plant

92% ServerHall
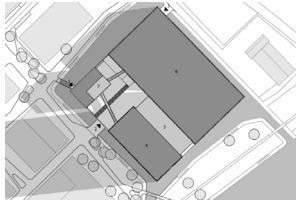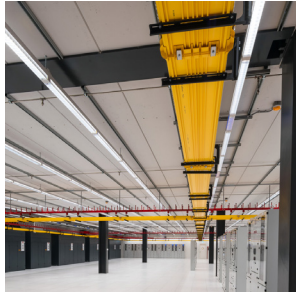
45500 m²

Datacenter, Bahnhof, Stockholm, Sweden

25% Office

20% Cooling plant

50% ServerHall
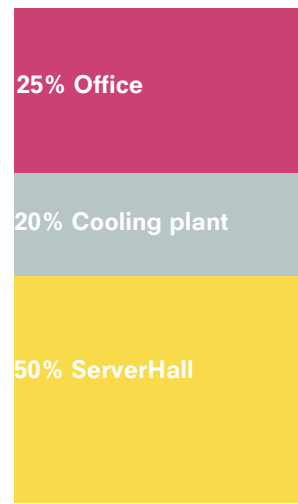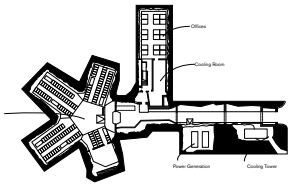
1000 m²

SantandarDatacenter

3% Office

47% Cooling plant

50% ServerHall
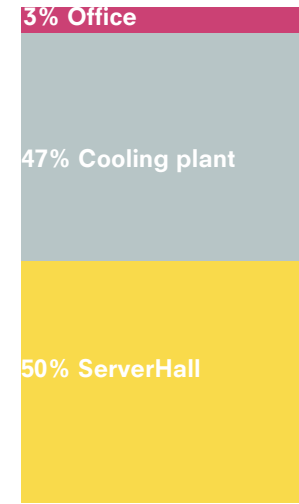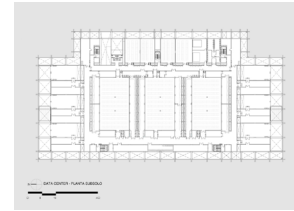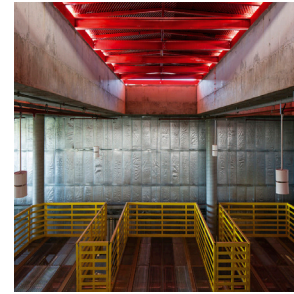
28670 m²

Dollar General , Distribution Center

28% Office
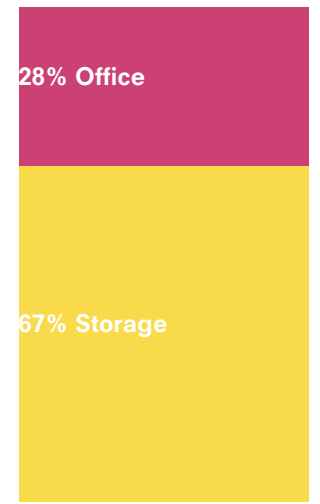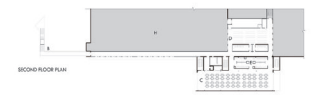
67% Storage

10990m²

Logistic Center, Modostudio

19% Office

81% Storage

13760m²

Théodore Charpentier, Projet de prison pénitentiaire
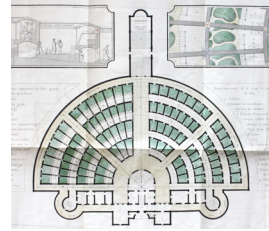
Hippolyte Lebas, Petite Roquette
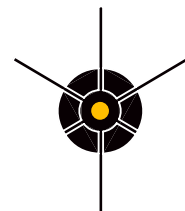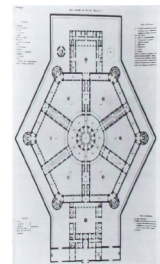
John Haviland, The Eastern Penitentiary, Philadelphia, 1823-1829.
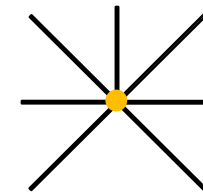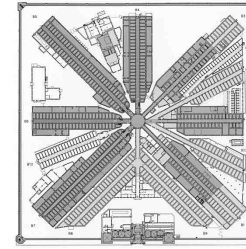
Samuel Vaucher Crémieux, Prison pénitentiaire de Genève, 1822-1825
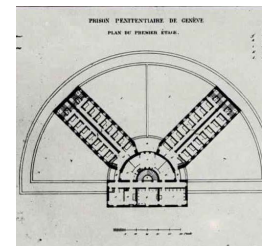
Jeremy et Samuel Bentham, Projet pour une prison Panoptique (1791)

Portman Castle

● Word lab/40m²
○ Lab space/ 989m²

● Mood making lab/68m²
○ Lab space/ 989m²

● Game lab/35m²
○ Lab space/ 989m²

● Food lab/55m²
○ Lab space/ 989m²

● Digital lab/76m²
○ Lab space/ 989m²

● Heirtage lab/90m²
○ Lab space/ 989m²

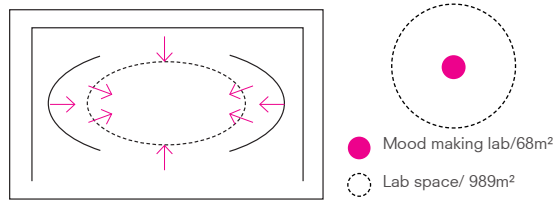● Lab acquaintance/310m²
○ Lab space/ 989m²

● Youth library/ 315m²
○ Lab space/ 989m²
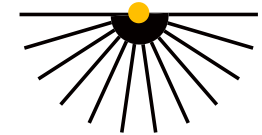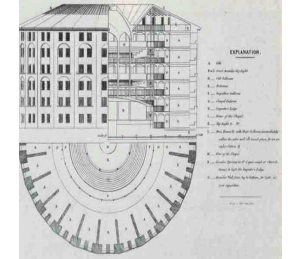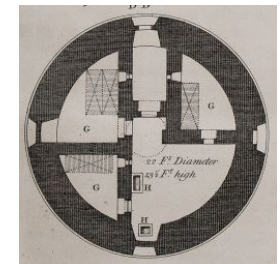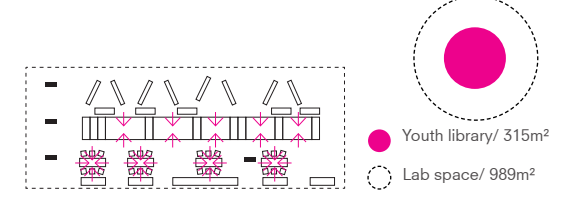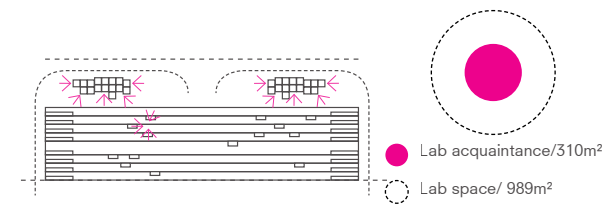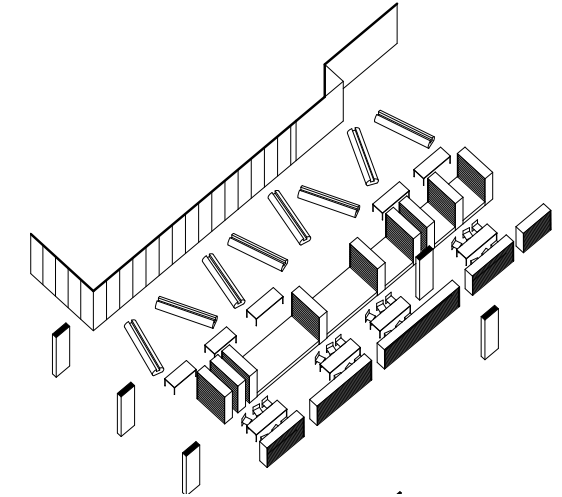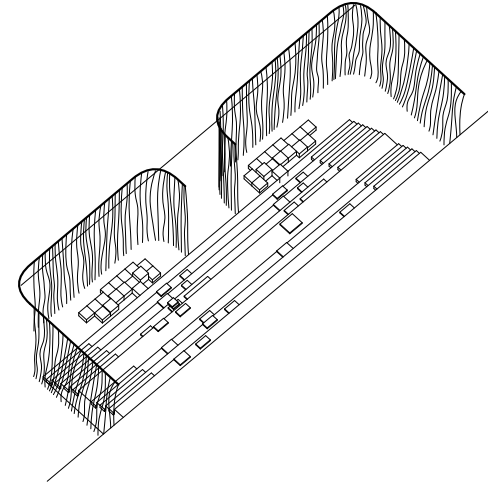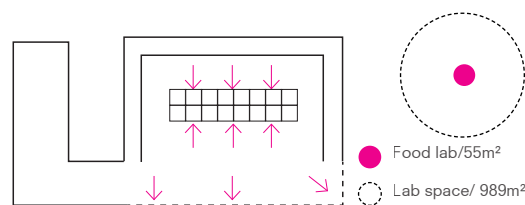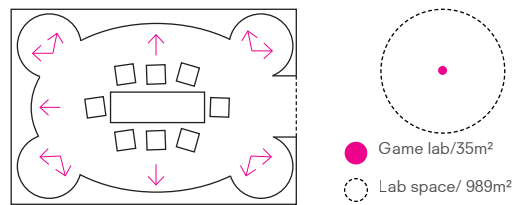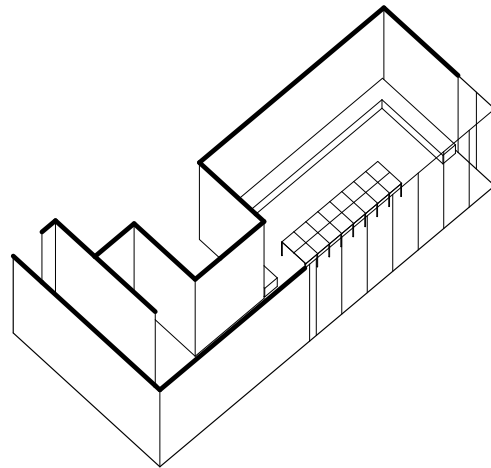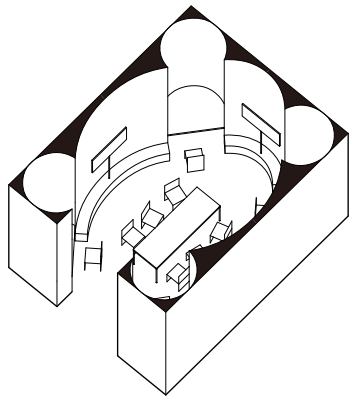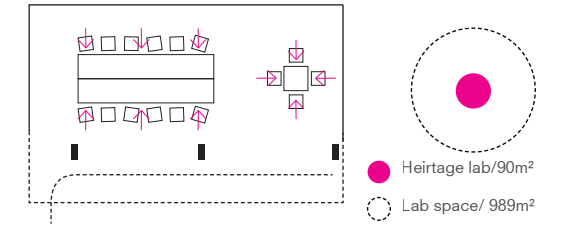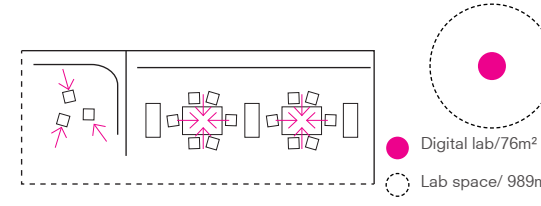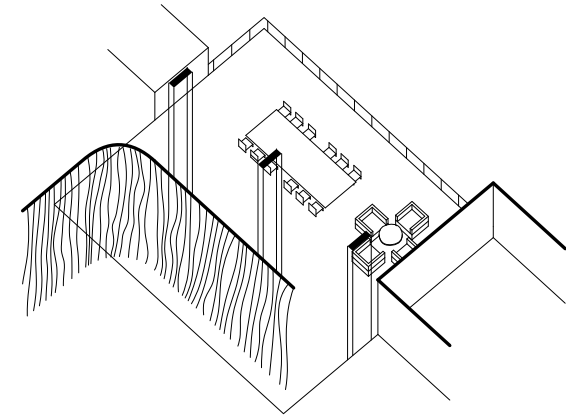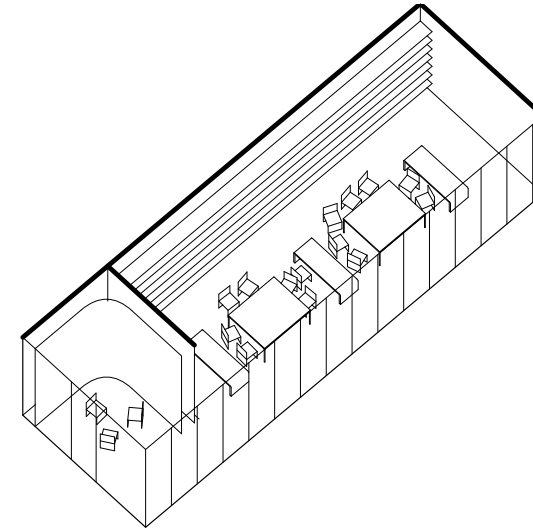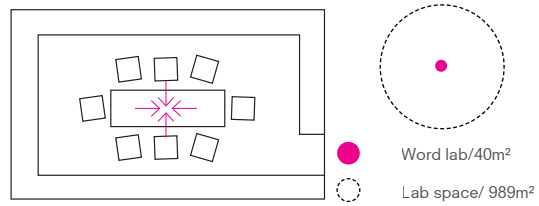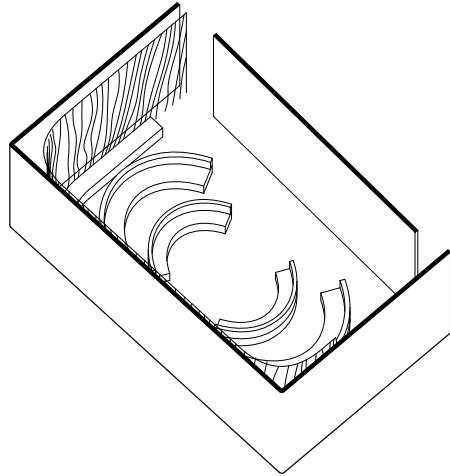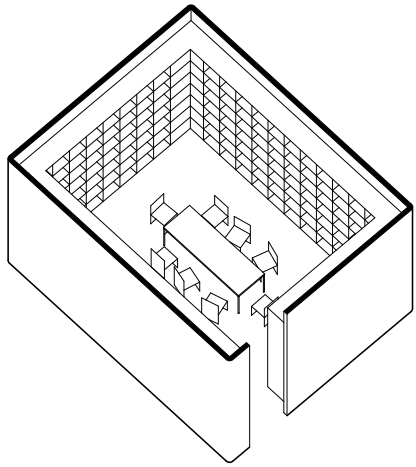
Graduation plan(Msc 4)

	RESEARCH	DESIGN
P2.0 / MORPHOLOGY	●Group vision Analysis ●Relationship between group vision and individual concept ●Program analysis	●Massing options ●Programmatic options ●Design options ●Revised design option
P2.5 / DESIGN	●Functional research ●Reference research ●Structure research ●Reference research	●Developed plans ●Developed sections ●Developed elevations
P3.0 / MATERIAL	●Research on materials ●Research on structural systems ●Structure on facades	●Developing materials ●Developing from details ●Developing facade
P4.0 / FINAL	●Finalizing research	●Finalizing design brief
P5.0		

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