

KNB nationale
bibliotheek

Building Balance

Spatial Strategies for Research and
Public Functions at the Koninklijke
Bibliotheek

AR3AH115 Heritage Graduation Studio - Revitalising Heritage

P1: Research Plan
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Abstract

The modern library of the 21st century has evolved from a static repository into a multifunctional 'third space' that fulfils a diverse range of social needs. While public libraries increasingly prioritize social functions - such as makerspaces, event spaces and cafés - national libraries like the Koninklijke Bibliotheek (KB) in The Hague require quiet and focused environments for research. Therefore, the KB faces a unique challenge: balancing their core mission as research institutions and preservers of cultural heritage with growing societal demands for openness, accessibility and public programming.

This research investigates spatial strategies to mediate these competing demands, addressing the question: How can spatial strategies in the building of the Koninklijke Bibliotheek contribute to creating an effective balance between research and public needs? Through a literature review, user surveys and case study analysis (e.g., Seattle Library, Oodi Helsinki Library) the study identifies spatial design strategies that will reconcile the research functions of the KB with its public mission.

Keywords: national libraries, spatial design, balance, multifunctionality, researcher and public needs, library design, Koninklijke Bibliotheek

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1. Introduction

1.1 The Evolving Role of the Library

In recent decades, the role and function of libraries have undergone a significant transformation. Traditional 19th and 20th century libraries, such as Bibliothèque Sainte-Geneviève and the Stockholm City Library (*figure 1&2*), were characterised by their static design and the quiet and orderly atmosphere focused on individual study and (book) collections. However, digitisation and the changing needs of society have led to the dynamic library designs of the 21st century. (*figure 3&4*) These modern libraries are evolving into welcoming social hubs, characterised by their open and flexible design. This transformation enables them to accommodate a diverse range of programmes with a strong focus on the user, beyond their traditional function. (*Aabø & Audunson, 2012; Jochumsen et al., 2012; Latimer, 2018; Lushington et al., 2016; Publieke Ruimte Onder Druk, n.d.; Vinden En Binden van Publiek, n.d.*)

In the articles by Mady & Hewidy (2025), Mickiewicz (2016) and Wood (2020), this change is regarded as an opportunity for 21st-century libraries. Libraries are increasingly regarded as “third spaces”. The integration of diverse functions and activities facilitates broader community engagement, fostering the development of vibrant community hubs. Furthermore, the adoption of flexible and open architectural designs enables libraries to readily accommodate the evolving needs of their users, ensuring their continued relevance in the present and future.

Nevertheless, this transition from traditional, static libraries to multifunctional spaces also poses several challenges. As Mady & Hewidy (2025) have observed, the pursuit of openness and flexibility may make it difficult to provide each user with a consistent environment. This issue arises from the necessity for libraries cater to a diverse range of users in addition to fulfilling their primary function. While traditional users, such as researchers, prioritise quiet and private work areas, public users place great value on social interaction and a sense of community, considering interactive zones – such as makerspaces, cafés and workshops – to be essential. Consequently, many public libraries now prioritise social engagement, a shift that sometimes comes at the expense of their traditional functions. (*Athens, 2007; Farmer, 2016; Lehmann, 2024; Lushington et al., 2016*)

Examples such as The Seattle Public Library and the Tianjin Binhai Library illustrate these challenges. Despite their success as multifunctional institutions in attracting and accommodating a diverse audience, some user groups report issues such as noise disturbances and a lack of quiet study or meeting spaces. (*Athens, 2007; Lehmann, 2024*) As Schloffel-Armstrong et al. (2021) note in their article, “Sometimes it is a posing challenge to accommodate new functions within traditional functions.” The fact that libraries now cater to diverse user groups indicates that their multifunctional roles significantly influence their spatial design requirements. (*Abulude et al., 2024*)



Figure 1 - Stockholm City Library



Figure 2 - Bibliothèque Sainte-Geneviève, Paris, 1850

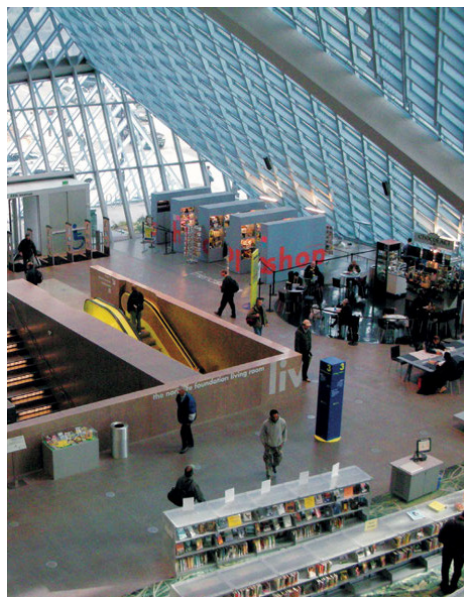


Figure 3 & 4- Public Library Amsterdam, OBA (left) & Seattle Public Library (right)

1.2 National Libraries: Between Tradition and Transformation

The influence of the multifunctional role on the spatial design of libraries has already been examined in the literature, with a particular focus on public libraries as social hubs, educational centres, and cultural meeting places. (Latimer, 2018; Lushington et al., 2016; Mady & Hewidy, 2025; Stanwicks, 2016) While public libraries have been the primary subject of these studies, it is important to recognise that different types of libraries exist, each serving different functions; see figure 5.

National libraries, such as the Koninklijke Bibliotheek (KB) in The Hague, exhibit a fundamental difference from public libraries in terms of their traditional mission. Their primary functions are preserving the cultural heritage and facilitating research. This contrasts with the open-access and community-participation model characteristic of public libraries, as national libraries have traditionally functioned within more closed and specialised frameworks. (Hoogstraten, 2007; Lushington et al., 2016)

Despite these distinctions, recent research indicates a clear shift in the role of national libraries. This change is driven by broader societal developments and evolving user expectations, which increasingly prompt national libraries to broaden their public-facing functions (Stephens, 2016). This transformation is reflected in initiatives aimed at enhancing public engagement, including curated exhibitions, cultural events, educational programmes, and the incorporation of more commercially orientated functions within library spaces.

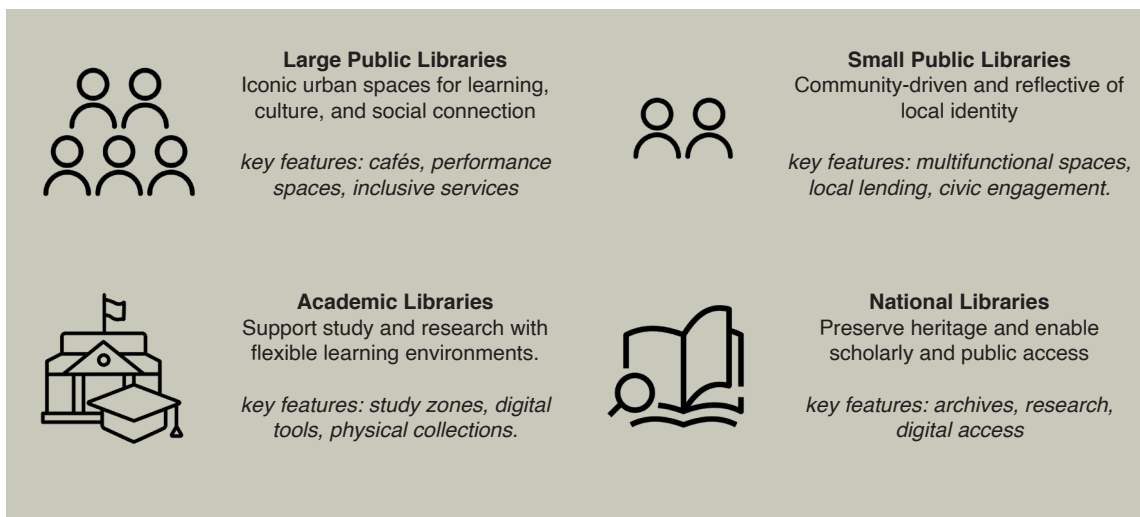


Figure 5 - Types of libraries according to Lushington et al. (2016). Own illustration based on source

1.3 Knowledge Gap: Spatial Strategies in National Library Design

A significant knowledge gap remains concerning the impact of the multifunctionality section on the spatial design of national libraries. There is a noticeable scarcity of literature specifically addressing the spatial design of national libraries. This makes the current research particularly relevant.

To address this gap, this study focuses on the National Library Koninklijke Bibliotheek (KB) in The Hague. (*see figure 6,7&8*) Designed primarily as a national institution for knowledge, heritage preservation and research. The KB has traditionally featured a closed architectural character with a strong focus on its research function, offering limited public accessibility and few public-orientated spaces. (*Hoogstraten, 2007*)

However, recent documents outline a transformative vision for the national library that extends beyond its traditional function. They indicate that the KB aspires to be an accessible and welcoming space for all Dutch citizens, in addition to its function as a research institution. This evolving mandate presents a unique challenge: balancing the library's established function as a research institution with the need cater to a more diverse, public audience. (*Berg, 2018; Hermans, 2018; Janssen et al., n.d.; Ministerie van Onderwijs, 2020*)

1.4 Research aim and societal relevance

This research project explores the potential of spatial strategies within the Koninklijke Bibliotheek (KB) to achieve a balance between its research and public functions. The research is informed by library design literature, user surveys and comparative case studies of multifunctional libraries. The objectives of the research are to identify the challenges and opportunities in the current spatial design of the KB with regard to combining research and public functions.

Secondly, it will identify the spatial needs of researchers and public users based on empirical data and an analysis of best practices. Thirdly, to develop spatial strategies that foster inclusivity and multifunctionality, without compromising the KB's archival and research function.

The findings from this research will give direction to the spatial (re)design of the KB and also contribute to theoretical insights on reconciling multifunctional requirements within national libraries.

1.5 Research Questions

The main question that will be answered in this research is:

How can spatial strategies in the building of the Koninklijke Bibliotheek contribute to creating an effective balance between research and public needs?

In order to develop an evidence-based answer to this main question, the following sub-questions will be investigated:

- 1. What are the challenges and opportunities in the library design to fulfil the researcher and public needs?*
- 2. What spatial functions and environments do researchers and public users require?*
- 3. How can spatial strategies for the Koninklijke Bibliotheek be formulated based on user surveys and case study analysis to balance research and public functions?*

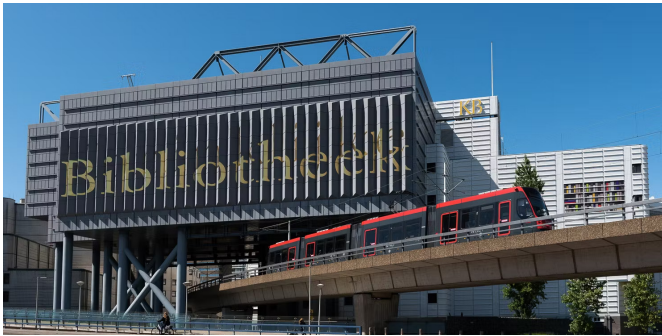


Figure 6 - Building of the KB



Figure 7 - Reading room of the KB building



Figure 8 - inside of the KB building

2. Definitions

Spatial strategies

These are design principles that organise the physical space of a building. They regulate how different functions are separated or combined - such as zoning, circulation, hierarchy, and thresholds – so that space is organised in an efficient and user-orientated way. (Ching, 2007) However, spatial strategies also encompass acoustic considerations and the optimisation of space through multifunctionality. (Abulude et al., 2024; Lushington et al., 2016)

Balance

The distribution of the elements of design—such as mass, colour, and shape — within a composition ensures that no part of the design overpowers or feels heavier than another. (Ching, 2007)

Research needs

Research needs refer to the facilities and resources necessary for in-depth research or study. This includes access to (specialised) collections and scientific databases, as well as the availability of quiet study environments and expert support. (Choy & Goh, 2016; Farmer, 2016)

Public needs

Public needs emphasise the importance of open and free access to information, resources, and community programmes for all. This includes providing learning-rich and welcoming spaces, facilitating social connection, and bridging the digital divide. (Garnar & Tonyan, 2021; MLA, 2010)

3. Methodology

To address the research questions, a mixed-methods approach is applied, combining case study analysis, surveys, interviews and literature review. This chapter describes the different methods and explains how will be used for each sub-question.

3.1 Sub-question 1: Challenges and Opportunities in Library Design

The first sub-question, “*What are the challenges and opportunities in the library design to fulfil the researcher and public needs?*”, will be answered through case study analysis and a literature review. The selected case studies have been chosen based on their user-centred approach and the extent to which they accommodate the needs of diverse user groups. *Figures 9,10,11 & 12* present the selected modern libraries: Oodi Central Library in Helsinki, Amsterdam Public Library, the Seattle Public Library and De Krook Library in Ghent.

The analysis focuses on four spatial themes that are categorised under spatial strategies, which are common factors in the design of multifunctional buildings. (*Caan, 2011; Ching, 2007; Jochumsen et al., 2012; Lehmann, 2024; Lushington et al., 2016*) The themes are explored through architectural drawings, floorplans and photographs. In order to structure and deepen the analysis, a set of guiding questions has been developed for each theme, as included in *Appendix 1*. The four spatial themes are:

1. *Zoning and functional layout*, with particular attention to the spatial organisation of functions and the relationship between quiet and active zones.
2. *Flexibility and multifunctionality*, focusing on spaces that can accommodate multiple uses.
3. *Acoustic strategies*, focusing on sound control and spatial separation.
4. *Accessibility and movement patterns*, with a focus on circulation, orientation and the relationship between public and research areas.

Additionally, relevant literature on the selected case studies will be reviewed. (*Latimer, 2018; Lehmann, 2024; Lushington et al., 2016; Mady & Hewidy, 2025; Sternheim & Bruijnzeels, 2021*). This aims to provide insight into the design vision of the architects or clients and to identify the functional priorities that were crucial in the design process. By answering this question, the study aims to gain an understanding of how modern libraries have shaped their designs to accommodate different user groups. The timeline in *figure 13* outlines the research process for this question.



Figure 9 - Oodi Central Library, Helsinki - Innovative Public Space and Research Atmosphere



Figure 10 - Public Library Amsterdam, OBA - Public-Focused; Accessibility, Culture and community engagement



Figure 11 - Seattle Central Library - Innovative Spatial Design for Multifunctionality



Figure 12 - De Krook Library Gent - Innovation, Knowledge Sharing, and Collaboration

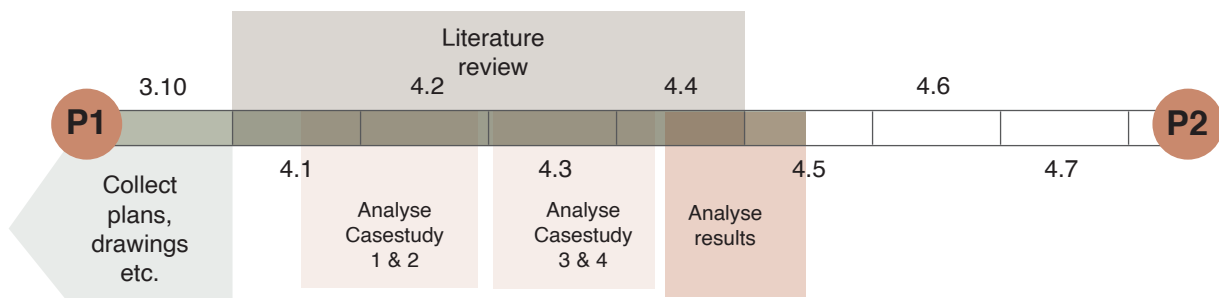


Figure 13 - Timeline for SQ1 Research, Own illustration

3.2 Sub-question 2: Spatial needs of researchers and public users

To address the second sub question, “*What spatial functions and environments do researchers and public users require?*”, a mixed-methods approach is employed. Firstly, existing literature on user needs in public, academic and national libraries will be reviewed. In addition, available documentation concerning the users of the Koninklijke Bibliotheek (KB) is consulted.

To gain a comprehensive understanding of current user needs, a survey will be conducted among visitors of the KB. This survey will be conducted in collaboration with fellow group members of the Heritage Studio and will take place both online and on-site, in and around the KB. A crucial element of the analysis is the clear distinction between the various user groups within the KB. In this study, a distinction is made between researchers and public users. *Figure 14* outlines the methodology of the survey.

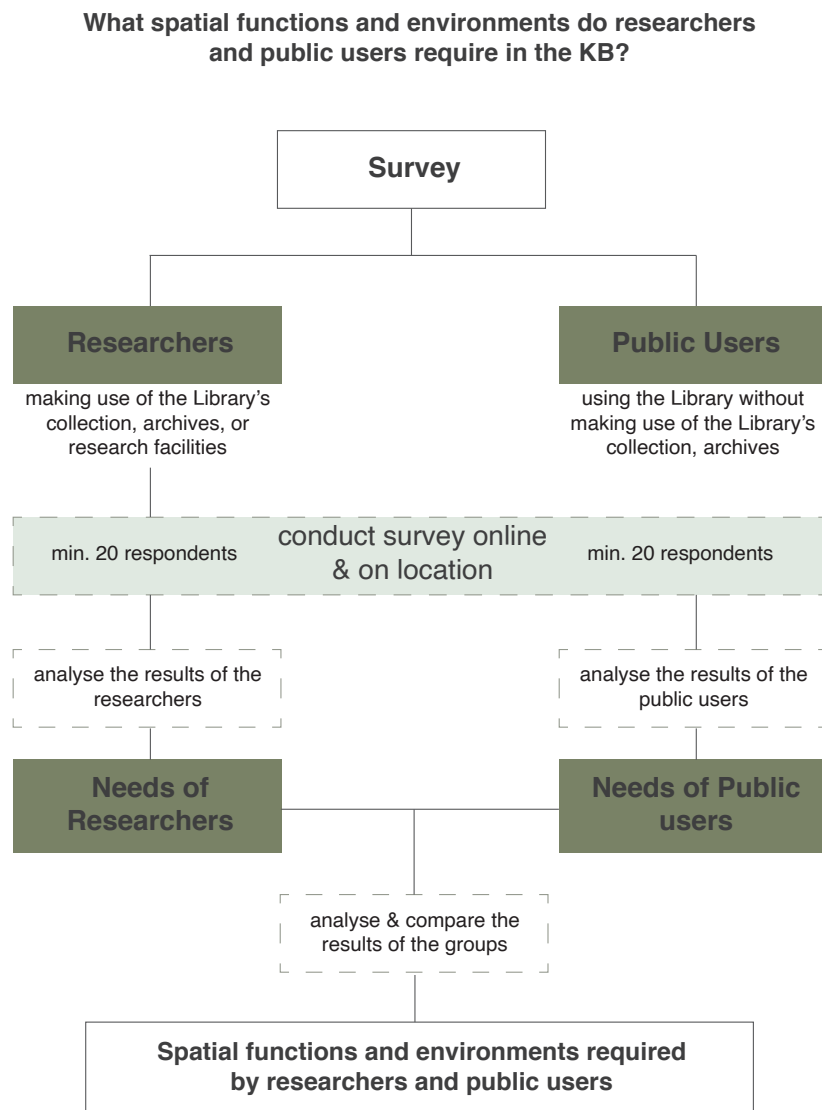


Figure 14 - Method for Survey, Own illustration

The survey results will be analysed separately for each group, followed by a comparative analysis to identify differences and similarities in the spatial needs of researchers and public users. This will facilitate a more nuanced understanding of the spatial functions and environments that are required within the KB and how these align with findings from the literature on other libraries.

As this research is conducted in parallel with a group research about the KB, the results of interviews held with KB users as part of the group research will also serve as additional data for answering this sub-question. These interviews will explicitly account for the mentioned user groups, thereby providing an additional perspective to enrich the analysis. The timeline for this sub-question is presented in *figure 15*.

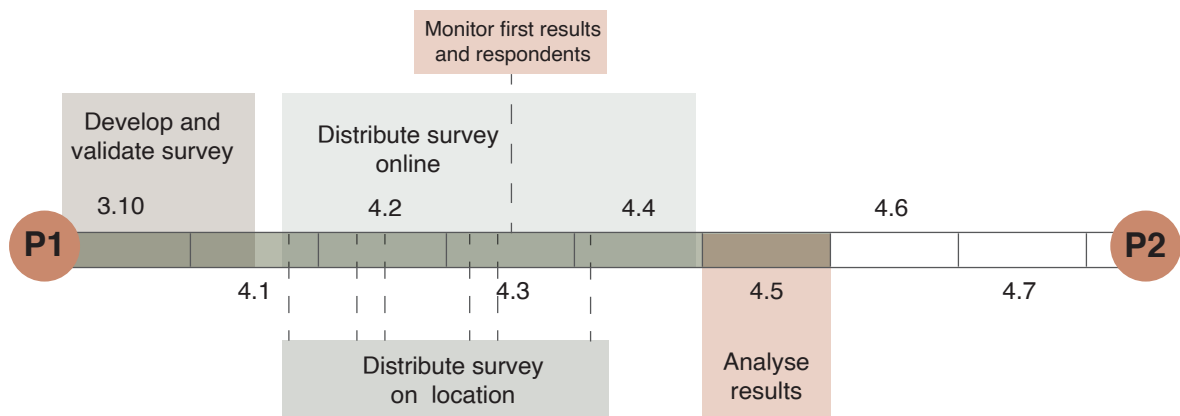


Figure 15 - Timeline for SQ2 Research, Own illustration

3.3 Sub-question 3: Spatial Strategies for the KB

The third sub-question, *“How can spatial strategies for the Koninklijke Bibliotheek be formulated based on user surveys and case study analysis to balance research and public functions?”*, focuses on the development of a strategic framework that aligns the spatial design of the KB with the needs of both user groups.

In order to address this question, the study will first explore spatial strategies currently employed in architecture. This will be followed by a data analysis of the findings from sub-questions 1 and 2 in order to identify which of these strategies are most relevant and applicable to the context of the National Library. The timeline for this part of the research is also included in *figure 16*, which illustrates that this phase will take place after the completion of the first two sub-questions.

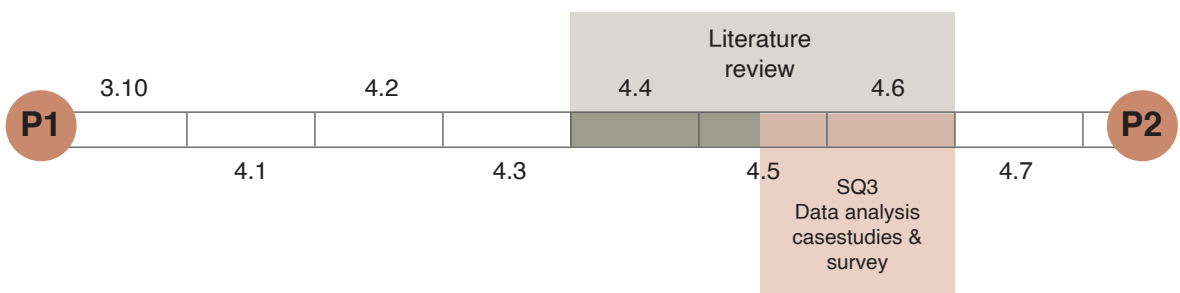


Figure 16 - Timeline for SQ3 Research, Own illustration

3.4 Literature reference table

Appendix 2 provides a preliminary table of relevant literature sources related to key definitions such as *spatial strategies, researcher and public needs, Koninklijke Bibliotheek and library design*. The table serves as an initial framework to guide the analysis of the sub-questions. It provides a structured overview of foundational references and establishes a thematic basis for this research. The table will be expanded during the research process as new sources are discovered.

3.5 Timeline and Research Design diagram

As illustrated in the previously presented *figures 13, 15 and 16*, the timeline has been elaborated per sub-question. In addition, *figure 17* presents a general timeline that delineates the overall research period prior to the P2 presentation. As previously mentioned, group research on the KB and its values will also be conducted during this period.

Following the P2 presentation, the focus will primarily shift towards the design assignment concerning the redesign of the KB, to which the outcomes of this research are expected to contribute. The research design diagram in *Appendix 3* illustrates the relationship between the research questions and the design question, demonstrating the extent to which they are interconnected.

3.6 Research Limitations

While this research can provide valuable insights, there are also some limitations to consider. Primarily, the selected case studies are leading in the field of public-orientated library architecture. However, it should be noted that these examples are situated in different national and cultural contexts from the KB. Consequently, the findings may not be universally applicable to the KB's context, though they may serve as a source of inspiration or a basis for comparison.

The user survey also has its limitations. Despite the design aiming to distinguish between different user groups, certain groups, such as occasional visitors or employees, may remain under-represented. Furthermore, there is a risk that the response per group is unevenly distributed, which may lead to a distorted view of actual needs.

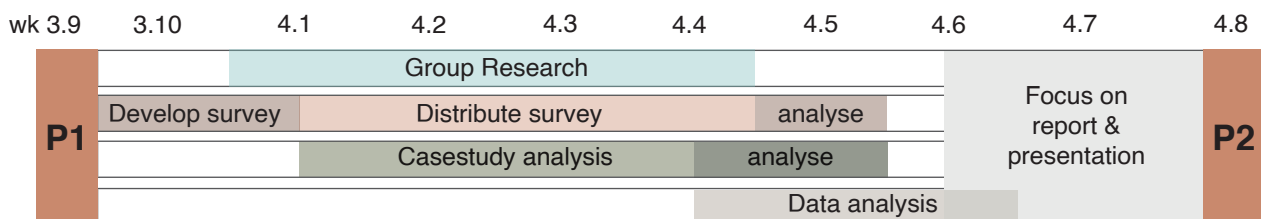


Figure 17 - General timeline for research, own illustration

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13. own illustration
14. Ibid.
15. Ibid.
16. Ibid.
17. Ibid.

5.1 Appendix - Case study Questions

Case Study Questions

1. Zoning & Functional Layout

- How are different functions (study areas, collections, cafés, research facilities) spatially organized?
- Are there clear separations or transition areas between quiet zones and social/active spaces?
- What strategies (clustering, dispersion, transition areas) are used to organize public and research spaces?

2. Flexibility & Multifunctionality

- Which spaces are designed for multiple functions (e.g., study space by day, event venue by night)?
- Are there flexible elements such as movable furniture or modular walls to adapt spaces?
- How is the layout designed to accommodate different types of activities (individual study, group work, events, informal meetings)?

3. Acoustic Strategies

- How are quiet and active spaces separated (physical barriers, materials, spatial layout)?
- What spatial or architectural elements contribute to noise regulation?
- Is there a clear strategy for positioning study areas in relation to busier zones?

4. Accessibility & Movement Flows

- How is internal circulation organized? Are there clear main and secondary routes?
- Are there visual or architectural elements guiding wayfinding?
- How accessible are research areas without disruption from public visitors?
- How is the relationship between indoor spaces and the outdoor environment designed?

.literature

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University libraries and space in the digital world Matthews en 2013

Basic design principles of architecture Parker en Yu 2011

	Spatial strategies	user needs	research needs	public needs	public library	academic library	national library	library design	KB
		■	■			■			
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5.3 Appendix - Research Design Diagram

