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PULCHOWK CAMPUS
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Pulchowk, Lalitpur



**PROGRESSION OF CIVIC SPACE:
LIBRARY WITH COWORKING SPACES**

IN PARTIAL FULFILLMENT
OF REQUIREMENTS FOR THE DEGREE
OF BACHELORS IN ARCHITECTURE

BY
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074-BAE-243

April, 2023

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ACKNOWLEDGEMENT

Without the kind assistance and support of numerous people, this report could not have been completed. I would like to sincerely thank each and every one of them.

First of all, I am highly indebted to my thesis supervisor **Asst. Prof. Dr. Inu Pradhan Salike** for her unwavering support and guidance, as well as for her immeasurable effort to provide me feedback and suggestions.

I would also like to sincerely thank the entire **Department of Architecture**, Pulchowk Campus, for providing the opportunity to work on thesis as a fulfillment of Bachelor's degree and also for all the resources they offered.

Moreover, I would want to convey my gratitude and appreciation to the librarians at the **Kathmandu University Central Library (KUCL)**, **Tribhuvan University Central Library (TUCL)** and **Mr. Dadhi Ram Poudel** from **Work Around** for their time, attention, and assistance in making my case study a pleasure.

I would also like to thank my family members who went out of their way to ensure everything around me was fine and helped me with their abilities. My thanks and appreciation also go to my seniors and friends who despite having their own hardships were there for me to help me in my work.

Lastly, I profess my thanks and regard to all the assisting hands for their constant support and encouragement throughout each step of my research.

Supriya Sharma

074-BAE-243

ABSTRACT

People visit libraries not only to read and borrow books, but also to gather, share information, and connect with others who share their interests. The library has changed from “collection to connection” and has evolved into a social hub for citizens. Modern libraries now combine traditional functions along with new functions which cater to society’s needs and keep the library relevant or active in the present era.

This project proposes a new typology for a public space- library with coworking spaces. In doing so, it reimagines the library as an extended place that incorporates several services and serves as a vibrant public space that is accessible to all, rather than as the "definitive repository of knowledge."

Therefore, the idea expresses the role of architectural intervention in revival of public library to transform the institution and make it relevant for the everyday usage of the nearby residents.

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1. INTRODUCTION

1.1 Background

The public library, local gateway to knowledge, provides a basic condition for lifelong learning, independent decision-making and cultural development of individual and social groups. Primary purposes of the public library are to provide resources and services in a variety of media to meet the needs of individuals and groups for education, information and personal development including recreation and leisure. As a public service open to all, the public library has a key role in collecting, organizing and sharing information, as well as providing access to a wide range of information sources. (The public library service: IFLA/UNESCO guidelines for development)

As global trends indicate, the change of libraries from simple collection houses to modern libraries; it includes improvements to library spaces appropriate for coworking and social learning. A work style in which people from many occupations and jobs come together and share the same workspace, enhancing each other by actively communicating and sharing wisdom and information is known as coworking. Santani (2012)

Library buildings usually include quiet and pleasant study areas, as well as communal spaces for group study and conversation. They also offer public access to its electronic resources, such as computers and internet. By combining a coworking space with a library, individuals can have access to these resources as well as the space to work and collaborate with others. The spaces offered by library are community centers, collaboration hubs, and social spaces where individuals from various backgrounds may gather to share knowledge and explore new ideas. Because knowledge and information are so important for overall development, libraries that handle and manage knowledge and information are priceless and should be transformed into active public spaces.

This thesis looks into an alternative strategy for public libraries due to the inactive and neglected state of this public institution. In order to create a single space that supports reading, learning, working, and sharing of information, libraries and coworking spaces will be combined.

1.2 Need identification

Libraries provide access to a wealth of information, resources, and knowledge in various formats, including books, journals, databases, and e-books. This access is particularly important for those who do not have the resources or means to access such materials elsewhere.

Recent earthquake in 2015 in Nepal has devastated major built edifices in the country. Libraries were also the victim of such edifices. Nepal National Library, Kaiser Library, TUCL which housed appreciable amount of information carrying books and other medias

were also affected by the earthquake. After the total destruction of these libraries an alternative planning of library with considerations to both traditional and modern functions seem necessary. In the age of digital information, libraries offer free computer access, Wi-Fi, and online resources to patrons. Also, even though digital media is gaining fame, the library serves as a community hub and provides a physical space for people to gather, learn, and connect.

Also, due to the change in technology and thinking of people, the number of startups is increasing. Independent entrepreneurs and young individuals do not have enough money to rent an office space. As a result, they commonly have little alternative except to work from home or go to coffee shops or other public cafes. They may be content with coffee shops at first, but after a while, they seek a professional working environment. As a result, they require a working atmosphere in which they may freely work on their projects without feeling isolated or getting distracted.

Partnering with a coworking space can help libraries stay relevant and provide new opportunities for their patrons. Libraries typically have an abundance of resources such as books, journals, and research materials that can be useful to those using the co-working space. Co-workers can benefit from having access to these resources in the same location. Similarly, Coworking spaces often attract a lot of people looking for a place to work or collaborate. By partnering with a coworking space, libraries can increase their foot traffic and attract new patrons. So, a public library including coworking spaces serve as a hub for individuals to connect, learn and share information, which meets the demands of both traditional and modern libraries.

1.3 Importance of the research

- This research will assist individuals in understanding the value of a public library in a city as well as new requirements in library planning and space design.
- To understand how libraries are changing in the present time and how they are being combined with other functions like coworking spaces to become an active space for the people.

1.4 Problem statement

The lack of public reading spaces and well-maintained libraries is hindering the reading culture among Kathmandu's new generation of book lovers. (Arya Mainali and Diya Rijal, 2019).

Despite the fact that everyone understands the value of a library to a community or city, Nepal lacks proper public libraries. Some of the few public libraries present do not have book lending services, while others do not have clean, comfortable reading spaces that is the top most requirement of any kind of library. The present libraries are not resourceful and well-maintained, the library contents are stored without regard for sunlight or dust particles. Most importantly, the majority of the buildings that house libraries are not designed with libraries in mind.

Books are no longer the only source of knowledge because of the widespread accessibility of the internet. Libraries, historically viewed as a repository for literature, must evolve to meet changing public demands and needs. The distance between public institution and the public- its target audience, is increasing every day. Libraries can no longer be regarded as places to read and store books but rather as a place for human interaction, a place for public discourse and a place for continued education.

The demand of library and coworking spaces is seen increasing as people are now inclining towards reading books and want a place where they can work individually or in a group. Nepal has been lacking in this field as the public libraries present do not offer proper reading rooms along with spaces where they can work on their own.

1.5 Objectives

The main objectives of this project are:

- To design a library that combines both traditional and modern library attributes and revive them as active community place.
- To design a library environment that promotes different forms of learning.
- To form an environment that encourages social interaction and enhances networking and collaboration opportunities for businesses by working in close proximity to people in other fields that share similar values.

1.6 Proposed methodology for research

Specific procedures or techniques are used to identify, select, process, and analyze information for this thesis project. Site visits will be carried out to find out how the environment affects the location. It is critical to conduct site research and analyze the geography, climatology, and location of existing buildings in site in order to design the best possible space. It is also critical to examine a number of case studies connected to the project typology. The methodologies and procedures used are literature review, case study, and design idea formulation and planning. This procedure entails identifying the project location, conducting a case study of similar projects to determine the building situation, and developing a design program. A design concept will be generated based on this process. The proposed methodology for this research is as:

1. Theoretical understanding and data collection

A literature review of books, reports, articles, research papers, surveys, and other related publications referring to the data for the project is used to compile the necessary information for the project. The necessary facts are also revealed and analyzed during the information gathering procedure. Survey work is also done when necessary to obtain data.

2. Literature review

The section will include pointers for things to take into account when designing any built form. As a result, reference materials for architectural standards relating to national and international standards must be reviewed. Also, the project-related books, papers, project works, documents, etc. are carefully researched in order to comprehend the various aspects and significance of the project. We can get more information from the case studies and what is necessary for the project from the conducted literature review.

3. Case studies

Several case studies will be conducted to ascertain the project's essential requirements. One of the most crucial steps in a case study is gathering the necessary information about the situation, as the richness and depth of what is known depend on the skill and effectiveness of the data collection approach. The six major sources emphasized in the case study include participant observation, direct observation, interview, documents, archival records, writings and physical artifacts. Different establishments will be visited in order to investigate the primary factor of the design. The analysis of the existing feature, including both its positive and negative aspects, will result in a suitable building design guideline.

4. Site visit and analysis

The proper design guidelines for the project are determined after a site visit and sufficient investigation. The type of site it will be built on has a significant impact on the design that needs to be done. After conducting a project-related literature assessment, the project's appropriate site is chosen. Research will be done on the selected site to determine the project's best position, surroundings, topography, etc. for the best design output.

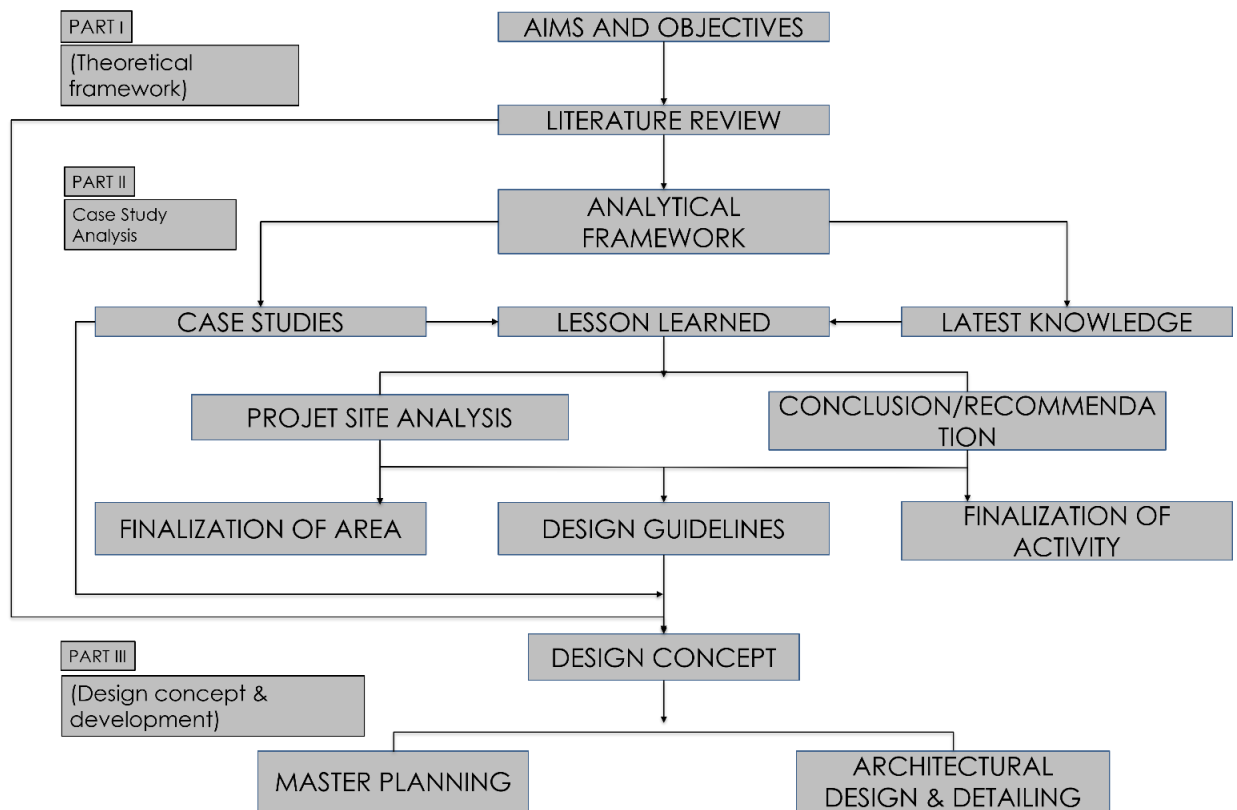


Figure 1: Research methodology chart

2. LITERATURE REVIEW

Libraries and coworking spaces both offer areas for people to work or study, but their principal functions and services differ.

Libraries have long been associated with the availability of books, research materials, and other educational resources. They are also frequently regarded as quiet areas for individual study and research. Libraries usually include designated sections for various activities, such as quiet study areas, computer labs, and meeting rooms.

On the other hand, coworking spaces are designed to provide a flexible, collaborative workspace for entrepreneurs, freelancers, and other professionals. Coworking spaces usually include open floor plans with shared workstations, conference rooms, and other amenities like kitchens and social areas. They frequently provide networking opportunities as well as community events.

In recent years, however, several libraries have begun to include coworking spaces as part of their services. These library coworking spaces may provide features comparable to those found in regular coworking spaces, such as conference rooms, event spaces, and networking opportunities. In some circumstances, libraries and coworking spaces may collaborate to offer joint memberships or services. Generally, while libraries and coworking spaces serve distinct purposes, there is some overlap in the services they offer. Both provide chances for learning, collaboration, and community building, and can complement one another in terms of providing flexible and accessible workplaces for a wide range of users.

2.1 Library

Library is a place set apart to contain books, periodicals, and other material for reading, viewing, listening, study, or reference, as a room, set of rooms, or building where books may be read or borrowed. (Dictionary)

A library, which can be of any size, can be organized and managed by a public entity such as the government, an institution such as a school or museum, a corporation, or a private individual. It is a collection of documents, books, or media that are easily obtainable for use rather than display. It provides physical (hard copies of papers) or digital (soft copies) access to materials. Libraries play an important role in socio-economic, cultural and educational development of a society. Its services improve knowledge and skills of people for positive productivity thereby contributing to national development. (Gill, 1997)

2.1.1 Types of libraries

A library is a building or a room containing collections of books, manuscripts, published materials for use or as reference serving to a defined community. A library can be of different types depending on the group of individuals it serves. The various types of libraries are:

- 1. Academic library:** An academic library is generally located on the campus of colleges and universities and serves mainly to the students and faculty members of the same institution. Academic libraries are categorized into school libraries, college libraries and university libraries.
- 2. Children's library:** Children's libraries are particular collections of materials aimed towards young readers that are typically housed in distinct sections of larger public libraries. In larger libraries, children's libraries may have entire floors or sections dedicated to them, whereas smaller libraries may have a room or area for children.
- 3. National library:** A national library is a library that is particularly established by a country's government to serve as the primary source of information for that country. These, in contrast to public libraries, rarely allow citizens to borrow books. They frequently feature a large number of rare, valuable, or notable works. A National Library is a library tasked with collecting and conserving the nation's literature.
- 4. Special library:** A special library is one which serves a particular group of people, such as the employees of a firm of government department, or the staff and members of a professional or research organization. Some special libraries, such as government law libraries, hospital libraries and military base libraries commonly are open to public visitors and the institution.
- 5. Public library:** A public library is an organization established, supported and funded by the community, either through local, regional or national government or through some other form of community organization. It provides access to knowledge, information and works of the imagination through a range of resources and services and is equally available to all members of the community. (IFLA/UNESCO Public Library Manifesto, 1994)

2.1.2 History Of Library in The World

The history of libraries began with the introduction of writing and the efforts to organize and gather documents. Since then, changes in the acquisition of resources, storage and arrangement of items, usage patterns, and changes in user needs have caused the libraries to evolve into what they are today.

2.1.2.1 Ancient stone library

According to some historians, the first libraries marked the end of prehistory and the beginning of recorded human history. Scribes began to establish archives of clay tablets that documented inventories and records of economic transactions as ancient civilizations such as the Mesopotamians and Egyptians developed the earliest forms of writing—Mesopotamian Cuneiform and subsequently Egyptian hieroglyphs. While these early manuscripts may not sound fascinating or intellectual, they played an important role in the advancement of knowledge and early human civilization. (Cite This for me, 2018)

2.1.2.2 The Invention of Paper Documents

Grand libraries were established to store the huge collections of scrolls that governments and people began to gather when ancient civilizations mastered means for making paper.

The Library of Alexandria and the Chinese Imperial Libraries, both built during the Han Dynasty, were among these famous ancient libraries. These libraries were open to the public, but they were difficult to navigate. Scholars who wanted to read specific books or authors had to request specific scrolls from librarians (Krasner-Khait). As a result, librarians remained key players in connecting scholars to crucial recorded knowledge. The Han Dynasty's libraries were especially noteworthy in the history of libraries because Chinese librarian Liu Xin invented the first library classification/formal catalog system (Frank). Furthermore, ancient Chinese scribes developed crucial book printing technologies such as woodblock printing, which allowed for the first large-scale printing and dissemination of literature. (Cite This for me, 2018)

2.1.2.3 Religious libraries in the Middle Ages and Early Public Library

Religious institutions began to take over the responsibilities of ancient government and private libraries when antiquity ended with the collapse of the Roman Empire. Catholic monks had an important role in collecting and generating written literature in Western Europe, and monasteries served as the primary library. (Cite This for me, 2018)

Imams and other experts in Muslim countries created collections of written literature using printing processes established by Chinese scholars. Early libraries housed Qur'anic manuscripts, as well as crucial early breakthroughs in astronomy and mathematics by Arabic intellectuals. Non-religious libraries began to spring up as the Renaissance and subsequently the Enlightenment movements swept across Europe. Libraries began to hold not only important ancient documents, but also modern books after the invention of the Gutenberg Printing Press. Despite the fact that these libraries were self-contained, they were exclusively accessible to cardholders who were mainly from prestigious academic institutions or the nobility. (Cite This for me, 2018)

2.1.2.4 The Development of Public Libraries

By the 1800s, there were libraries open to the public across the United States and Europe, but they were not public libraries in the same sense as they are today. Individuals from outside the institution were allowed to visit large university libraries and privately held libraries, but they had to pay to do so. The first real public libraries, supported by public taxes and thus open to the public, began to operate in

the late 1800s and early 1900s. Most universities and municipal libraries are free and open to the public, including private universities that receive federal funds. The fact that libraries are open is critical to their history, as it has formed a significant role for libraries in assisting the general people in gaining access to critical information ranging from medical and science to public affairs and the literary arts. (Cite This for me, 2018)

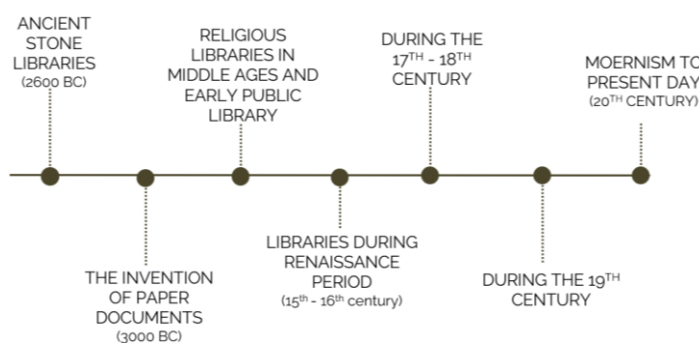


Figure 2: Timeline showing history of library in the world

2.1.3 Typology Of Libraries and Their Spaces

The library as an architectural type has a millennia-long history. With the introduction of digital technology in the late 1990s, the long history of its evolution was radically transformed. The introduction of digitized content and the emergence of a new type of book reshaped the field, throwing doubt on the future of the book as an item of paper and ink, as well as the library's significance as a space of collections and readers. Digitized material has not replaced the physical collection; rather, it has been integrated into the institution as an important component of a larger framework. Instead, the library's typology has been stretched to give new experiences within the library, increasing its knowledge provision. New programs are being introduced into the library to better serve, retain, and attract existing and new customers, ranging from shopping, entertainment, and the arts to healthcare and secondary education. These programs, which are primarily dictated by location and the socioeconomic demands of the communities, represent a distinct development in library typology. (Nolan Lushington, 2018)

The library's architecture initially emerged from the interior planning. Its interior layout emerged to characterize it over the course of centuries. Initially, libraries were only a chamber for keeping written scrolls, it later evolved into a reading room. Later, this modest area developed into a main reading room. For many years, only people who could read and write had access to libraries. Libraries are now accessible to everyone, and not just members of the upper classes use them. Making libraries more accessible to the public is strongly related to their appearance in the urban environment as buildings, rather than as a component of another building complex. (Nolan Lushington, 2018)

2.1.3.1 Study Libraries in the Middle Ages

During the Romanesque era, monasteries were the only places where libraries could be located. The books were housed in the sacristy close to the altar because most of them were religious scriptures for services. Therefore, the books were kept in the sacristy in safekeeping as part of the church's holy property. They were frequently kept in spaces directly above the sanctuary. The library was eventually relocated to a spot on the east side of the church, still close to the choir and choir stools, as it became less and less necessary to hold the books in the sacristy as the collection of books steadily increased to include theological and legal works for the monks' instruction. The book presses served solely as a repository for the books, the monks withdrawing to their cells for the purposes of study. (Nolan Lushington, 2018)

2.1.3.2 Libraries in the Renaissance – First Public Appearances

In the important cities and city-states of Italy, the Renaissance saw the construction of numerous new representative public buildings. Additionally, a few of these new constructions were libraries, always ordered by well-educated and powerful individuals. (Nolan Lushington, 2018)

The educated Cardinal Federico Borromeo of Milan commissioned the construction of a library in 1603, to hold his collection of 30,000 volumes and 15,000 manuscripts from all over the world. The Biblioteca Ambrosiana's entry leads onto Piazza San Sepolcro, with a projecting entrance that announces its presence to the surrounding urban environment. The Sala Federiciana, a two-story reading room, has a long barrel-vaulted ceiling with two semi-circular Diocletian windows at the ends providing illumination. (Nolan Lushington, 2018)



Figure 3: Biblioteca Ambrosiana, the interior the open shelves act as walls.

Source: Corinna de Marchi, Google photos

The open shelving where the books and manuscripts are held, however, is what makes this building unique. They appear to cover, if not entirely comprise, the entire surface of the wall (See fig.3). A gallery along the outside makes it easy to reach the upper bookcases. The Biblioteca Ambrosiana was the first library to have this type of shelving. From this point forward, all the basic characteristics of a library have been developed: a long, column-free space, open shelves, and galleries. These characteristics were then polished during the Baroque period. The galleries, for example, evolved into components that characterized the space, and shelves evolved from furniture to an integrated part of the walls. (Nolan Lushington, 2018)

From the abovementioned, it is obvious that the library's interior underwent continuous development, although no such trend can be shown for the library's exterior.

2.1.3.3 The Library as a Gesamtkunstwerk (total work of art)

While the Baroque period saw no additional fundamental typological advances, libraries evolved into magnificent Gesamtkunstwerke - a fusion of building, painting, and stucco that mirrored the era's general lavish attitude and beauty. By the second half of the 17th century, monastic libraries had evolved to the level of importance of the refectory or the communion hall. The library was frequently built over the refectory, the two rooms incorporated in a single building that extended like a spur from the cloister's quadrant, its built bulk acting as a contrast to the church. Libraries began to be based after nobility-representative buildings such as ceremonial halls, antiquaria and cabinets of curiosities, and, most notably, cathedrals. (Nolan Lushington, 2018)

2.1.3.4 During the 17th and 18th century: The Pantheon of Knowledge

The concept of the library as a centrally designed building gained popularity in the 17th century. In 1705, the court architect of Brunswick, Hermann Korb, constructed a library above the castle chapel, a square layout with an octagonal arrangement of free-standing

columns within it, as part of modernization work on the renaissance Blankenburg Castle in the Harz area of Germany.

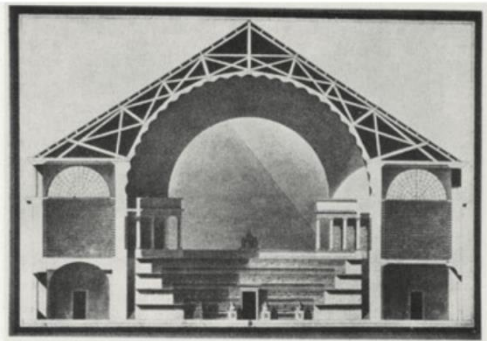


Figure 4: Etienne-Louis Boullée, initial design for a public library in Paris, 1784. The cross section shows a domed central space.
Source: (Nolan Lushington, 2018)

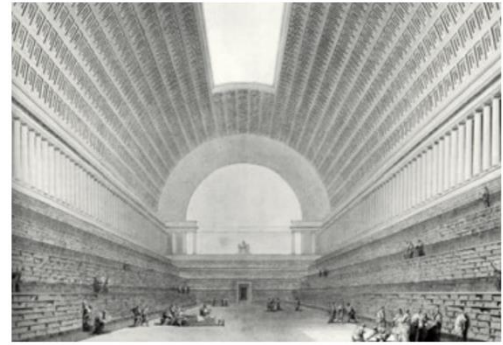


Figure 5: Etienne-Louis Boullée, design for the reading room of the National Library, 1785.
Source: (Nolan Lushington, 2018)

Etienne-Louis Boullée drew up a design for an ideal form for a public library in 1784 that features a monumental domed central space. The bookshelves are arranged beneath the vast semi-circular dome in four staggered tiers beneath one another in the manner of rows of theater seating. It is during this period that he also produced a design for the National Library, which applied his earlier idea for a public library to an elongated rectangular volume. Boullée's visions would have a strong influence on later generations' ideas about the design of library reading rooms. (Nolan Lushington, 2018). (See fig. 4 and 5)

In 1862, Henri Labrouste designed the French National Library, which completed a piece of the Louvre on the Rue Richelieu, resulting in a cohesive ensemble. The center oval reading room's towering arcades are built of slender iron columns that support a shallow vault with a huge oval skylight. From the floor to the height of the main cornice, bookcases fill the walls behind the arcades. The reading room took advantage of the possibilities provided by the introduction of iron as a building material and served as a model for many subsequent reading rooms until well into the twentieth century. (Nolan Lushington, 2018)

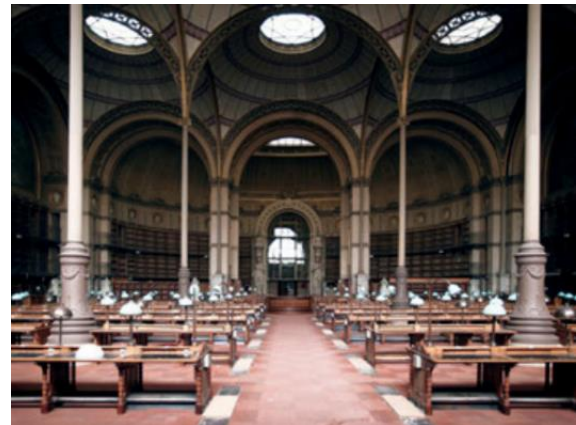


Figure 4: French National Library, Paris, 1868, The domed construction of the large reading room.
Source: *Libraries: a design manual*

This brief historical study shows firmly that, unlike other types of structures, no single typological model has emerged for the library across time. The reading room, as both a book depository and a study space, remains the key focal space of a library, and its formal elaboration has always impacted library architecture. As a result, libraries have always been built from the inside out. (Nolan Lushington, 2018)

2.1.3.5 From the 19th Century to Modernism and the Present Day

Most libraries today operate as hybrid models, providing both traditional library services and those improved by digital technology. Searching, storing, archiving, and, more recently, online searching, accessing digitized and scanned collections, and digital archiving are all activities that take advantage of the digital era. A library, for example, provides a sensation of "presence" that neither Google nor online book shopping can convey. The library can provide comfortable seats as well as an environment that encourages tranquility and reflection, as well as inspiration and intellectual stimulation; in other words, a sense of community. As a result, newer libraries include distinct areas with distinctive designs that are tailored to the demands of various user groups. (Nolan Lushington, 2018)

Libraries of the 19th Century

Architectural space and architectural form remained consistent during the time span. There were no major shifts. New public buildings used the same standard set of forms - rotunda, open hall, and atrium - a typology of spaces seen in all nineteenth-century public structures. The concept of spatial typology and spatial character, rather than architectural form, was used by nineteenth-century architects to solve problems about function. These spatial kinds had been used for over 2,000 years and had simply been altered to fulfill various functions. For example, the rotunda could be a sacred place, an exhibition area, or a reading room. In the nineteenth century, function was expressed via the character of the space rather than through architectural or spatial form. Although the spatial aspect altered in each situation, the building's form could remain the same for all three roles. (Nolan Lushington, 2018)

The library of the 20th Century – New Spatial Concepts in the Age of Modernism

The 20th Century Library - New Spatial Concepts in the Age of Modernism Architectural space evolved drastically around the end of the nineteenth and early twentieth centuries. Architects began inventing new spatial notions that were incompatible with previous epochs' architectural principles. The early twentieth-century Modernist design deviated from past concepts, proposing a new spatial concept of open or flowing space. Never in architectural history has there been such a dramatic shift in the evolution of architectural styles and architectural form.

Gunnar Asplund (1885-1940) was a Swedish architect who stood on one leg in the nineteenth century and the other in the twentieth. The history of his design for Stockholm's City Library demonstrates how Asplund's approach changed, which is obvious in the building's design and one's experience of it. This transition is most visible, paradoxically, in the modern plinth. The major portion of the structure, the library, is elevated on a contemporary plinth that appears to hover above ground. History is flipped in its head here: the old appears to develop out of the new rather than the other way around. (Nolan Lushington, 2018)

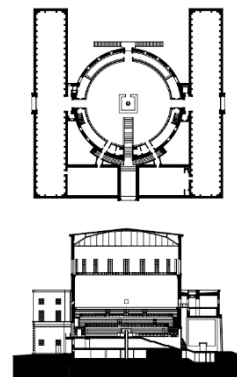


Figure 5: Plan and section of City Library in Stockholm.

Source: *Libraries: a design manual*

The sequence of spaces that lead into the interior is based on the concept of enclosed spaces. The modern plinth's stairs to the entryway are tightly grasped by flanking walls. The books are housed in a spacious, well-lit area at the end of the corridor. The main room of the library represents knowledge. This concept is very much in the tradition of the nineteenth century, as Modernism is not receptive to describing space by metaphors. At the same time, the enormous center room is quite restrained, with no artwork or ornamentation: simply books, white walls, and light. Asplund therefore constructed a setting that is rooted in 19th-century heritage but can equally be understood as contemporary. Asplund uses a system of shelving built into the walls to give the central space the feel of a library. The City Library in Stockholm, on the other hand, is one of the twentieth century's last big libraries to adopt such a system. (Nolan Lushington, 2018)



Figure 9: Mount Angel Abbey Library, main floor
Source: mountangelabbey.org

The big enclosed reading room and attached storage were no longer used after 1930 for two reasons. For starters, embedded wall storage did not fit with the concept of flowing space. And secondly, the large central reading room was no longer able to accommodate the growing stock of books. The distance between the books and the reading space grew ever larger. All of the spaces in his design flow into one another, with just the lecture hall and administrative areas remaining as closed spaces. The library does not have a reading room; instead, reading spots are scattered around the building. It embodies Modernist concepts by reimagining the library as an open landscape of areas that flow into one another. (Nolan Lushington, 2018)

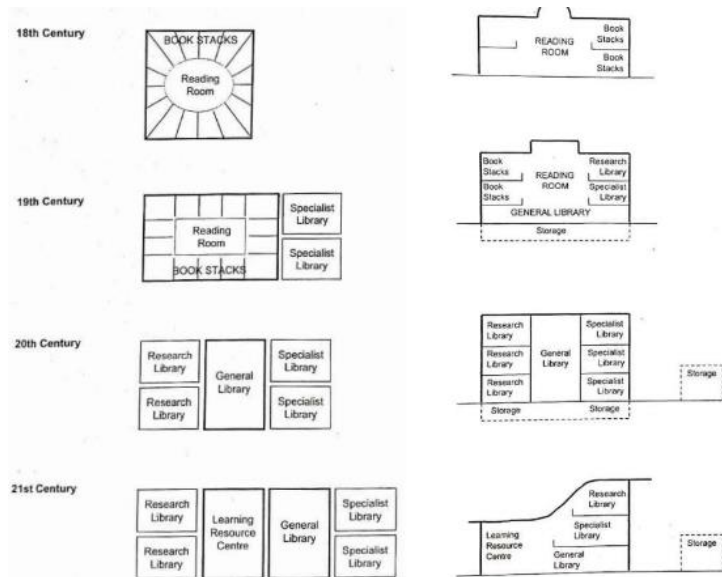


Figure 6: Change of library interior and outer form. Source: (Edwards, 2009)

2.1.4 History Of Library in Nepal

The ancient kingdom of Nepal's rulers were active readers, writers, and collectors of manuscripts, books, and other types of documentation. Nepal has been a center of learning since history. The Hindu temples, Bouddha Gumbas and Viharas were the places of education. Those holy places used to collect the manuscripts in various forms such as Tamrapatra, Bhojoatra, Shilapatra etc. (Niraula) When the Lichhavis first arrived in Nepal, they brought many more precious manuscripts with them and established the 'Safu Kotha' library in Bhakapur. Because the written history of Nepal began with Lichhavis King Mandev, it is also stated that Safukotha is Nepal's first library. This location is now known as Sokatha. Sakotha was well-known for eastern philosophy and tantrism from the 13th to the 17th centuries. It is said that the library housed about 14000 manuscripts at the time. Unfortunately, most of Safukotha's writings were destroyed by fire, which some historians believe lasted at least a week. Few manuscripts were transported to Hanumandhoka. (Bati, 2020)

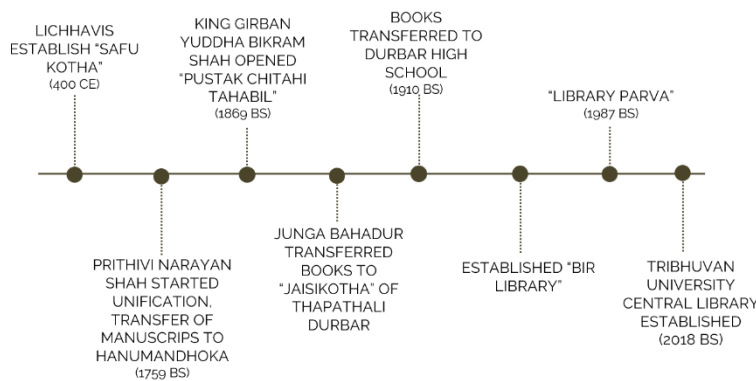


Figure 7: Timeline showing history of library development in Nepal

Prithivi Narayan Shaha had started to build up the unified Nepal from 1759 Along with the unification of Nepal, he began to acquire important manuscripts and written materials, which he preserved at the Hanumandhoka palace. (Niraula)

The actual development of libraries started in Nepal after King Girban Yuddha Bikram Shah, issued a decree (Ialmohar) in 1869 B.S., to open a Library "Pustak Chitahi Tahabil" in his Palace. It was the first library in Nepal. A librarian (Pandit Kedar Nath) and two assistants were appointed to look after the library. Since 2008, Nepal has observed "library day" in remembrance of the memorable day. It falls on August 31st. (Niraula)

After this, Prime Minister Junga Bahadur Rana opened first school in 1843 B.S and transferred the books from the Pustak Chitahi Tahabil to the Jaisikotha of the Thapathali durbar. He set up offices called Munshikhana and Jaishikotha, to preserve those books and manuscripts. Later in 1910 B.S., the books were shifted from Thapathali Durbar to the top floor of Durbar High School. This continuous shifting of the books resulted in the loss of valuable documents. Therefore, Junga Bahadur Rana established Bir library (Ghantaghar library) for proper safe keeping of the books. (Niraula)

Later in 1918 A.D., Tri Chandra college, the first Higher education institution, was established which had a library where large volume of different books, manuscripts, periodicals, etc. were kept for preservation. In 1987 B.S., during Bhim Shumsher Rana regime, some youths prepared to establish a public library called “Saraswati Sadan”. Unfortunately, one person among the group informed the rulers. All the persons involved to establish the library were fined Rs. 100 each. This is called as “The Library Parva”. (Naresh Koirala)

There were only 31 libraries in Nepal before the independence many of them were as personal library such as the Kaiser Library (Kesharmahal), Bharati Bhawan Library (Basantapur), Singh Library (Thapathali), Dhawal Library (Palpa), etc. After the independence many educational institutions and public libraries were started throughout the country. Tribhuvan University Central Library was established in 1952 in Cooperation with the USAID. Current renowned libraries such as Nepal National Library, Madan Puraskar Library were established in 1957.

Between 1950 and 1960 several public libraries were established throughout the country through community initiatives, but there was no formal state recognition of libraries as institutions. In 1960 the king dismissed Nepal’s first popularly elected government and started ruling the country as an absolute monarch. Public libraries were again discouraged and the libraries established in the fifties began to close. This was possibly hastened by the lack of dedicated financial support, as well as it being to the benefit of the government to limit access to information. (Niraula)

After 1990, when absolute monarchy was replaced by a constitutional system of democratic governance, interest in public libraries resurfaced. The re-opening of a number of rural community libraries that were closed during the king's autocratic rule, as well as the number of requests for funding for community libraries received by INGOs such as Room to Read, Read Nepal, and the NLF, demonstrate this. Nepal's library population expanded from around 400 in 1990 to around 800 in 2003.

As of today, all colleges and universities have their own libraries, and various schools across the country have libraries as well. It is anticipated that the country has 1000 to 1200 public and community libraries. (Naresh Koirala)

2.1.5 Paradigm Change in Libraries

Libraries and learning have always been intrinsically tied. In the beginning, books available were few, valuable, and tightly guarded. Their development and production were labor-intensive tasks that were frequently lavished with riches and aesthetic ability. This began to change in the Western world with the advent of moveable type in the fourteenth century; nevertheless, because to the high cost of paper, books remained a luxury item until the eighteenth century. With the introduction of the Fourdrinier machine in 1807, mass-produced paper became relatively cheap, and it is arguably the most important industrial product of the nineteenth century. Throughout the nineteenth and twentieth centuries, books, periodicals, and newspapers grew significantly less expensive and more plentiful. (Bennett, 2009)



Figure 8: Paradigm changes in library

The learning paradigm changes are:

2.1.5.1 Reader-centered paradigm

Books are clearly in the service of readers in the first of these paradigms. Because books were few and valuable, the space was primarily meant for readers—usually a reading lectern or carrel for the monk, set opposite to a window for light. The concept of a departmental library in larger colleges and universities is based on the idea that books should be at the heart of scholarly work. (Bennett, 2009)

2.1.5.2 Book-centered paradigm

The storage of huge collections is a defining feature of a second paradigm for the construction of libraries, as indicated by this allocation of space. Most library holdings were quite limited throughout the nineteenth century. They could usually be housed in a single room or a group of rooms in facilities that also serve other objectives. It was clear that a new paradigm was required to accommodate huge and increasing collections. Over the course of 50 years, book space, not reader space, grew to dominate this library. Although this shift is most noticeable in research libraries, which have extremely huge collections, it was also common in academic libraries of all kinds, which saw a seeming inevitable displacement of readers by books over time. As books took over the place, a building type that was once believed to bring readers and books together became less and less welcoming to readers. (Bennett, 2009)

2.1.5.3 Learning-centered paradigm

Putting the learner at the center of library space planning is a return to the original paradigm, with the key differences that knowledge is now superabundant rather than scarce, and that virtual rather than physical space is becoming increasingly important. The original library design paradigm brought readers and printed materials together in a physical location. The design problem becomes less about the interaction of readers and books and more about the connection between space and learning. If we wish to make learning a priority in library design, we must first gain a basic understanding of the learning process. A learning-centered design practice's initial concern will be to create places that encourage intentional learning. We must continuously restate that the most essential educational function of physical library space in the twenty-first century is to encourage a culture of intentional study. (Bennett, 2009)

2.1.6 Basic Functions of Public Library

People can explore a wide range of interests and activities at their local public library. This section dives into what is believed to be the primary reasons why people visit public libraries.

2.1.6.1 Past Context

Previously, libraries were only used to gather books before becoming accessible to the public and allowing them to read books there.

i. A place for collection and reading of books

In their earliest forms, libraries were often private storehouses of information. They were not necessarily built to allow the public to freely consult books or take them off-site, as libraries do now, though some did. Many libraries in the Near East and Egypt were related to sacred temple sites or were part of an administrative or royal archive, whereas private collections became considerably more widespread in the Greek and Roman cultures. When libraries were open to the public, they were usually designed to allow visiting researchers to consult and copy texts. (Cartwright, 2019)

2.1.6.2 Present Context

People now use public libraries not only to learn, but also to socialize. Today, the public library serves as a community gathering place.

i. A place to learn

The promotion of early literacy is a priority for public libraries. (John, 2016) Libraries have long been regarded as one of the best places to learn new things. The goal of the first three modern public libraries, which opened in 1833, has been to provide access to knowledge to all classes of the population. Public libraries are well-known for being excellent places to study, and they continue to draw an increasing number of visitors, particularly students, who are looking for not only a quiet space to study, but also all the materials they may require in one location. A variety of shared places at public libraries can be used for studying. It provides visitors with comfortable furniture, so that each visitor feels compelled to return repeatedly. The library's divided rooms allow visitors to choose the one that best suits their needs, depending on the study job, whether it demands solitude and solo work or group work. Public libraries can also aid to increase productivity; by completing their studies in a peaceful atmosphere away from home, students are able to complete more work in less time. (Bluesyemre, 2021)

ii. A place to meet

People may now access information online with the press of a button, which has resulted in dropping visitor numbers and may even call into question the library's worth as a physical space. New technology, on the other hand, makes people more 'mobile,' and they are looking for new places to work and play. Individuals are drawn to the public library because it is a neutral, 'free' location where they can conduct business, study, or socialize. The library has recreated itself in this way. It has become a "third place". They are gathering places for people to make new acquaintances and exchange ideas and interests across social and intellectual divides. (John, 2016)

2.1.6.3 Mix Use of Public Library

The ability to serve several purposes is a key feature of public libraries. Public libraries provide a variety of services for adults, children, the elderly, civic society along with other members of society. (Md. Abul Kalam Siddike, 2014)

Frequently, public library is the only location where meeting space is free or even accessible. People want library designers to pay attention to people's needs by focusing less on books and more on creating flexible places for community and library events, collaboration, and study. Library designers must know that providing the appropriate space in library facilities is a fantastic method to induce flow of people in the library. Libraries should provide rooms for more than just reading, studying, and doing homework. They require digital collaboration spaces with colleagues engaged in similar tasks in libraries and learning centers across the world. (Cohen, 2009)

We have noticed an increase in the demand for group study rooms and project-based learning activities during the previous five years. Many students gather in groups and work on laptops. They are conducting study using technology and textbooks. Learning rooms have been created in many libraries so that the children's librarian, tutors, and students can collaborate. The convergence of these factors demonstrates how library buildings are changing their functions. Technology has produced a new collective behavior that needs more seating. We need to realize that digital work, books and e-books, periodicals, and portals will define the future of learning. Thus, convergence of both traditional and new method of space requirement is essential in today's context. (Cohen, 2009)

The library must be constructed with flexible space in terms of size and location inside the libraries, mobile furniture and ergonomic chairs, and tables for numerous purposes in mind. Simultaneously, it would be fascinating to create greater space for social interaction and group activities. (Mina Di Marino, 2015)

2.1.7 Trends of Modern Public Library

Many trends in library models have surfaced over the years such as removing all books from the library and going completely digital or going completely backwards and banning all forms of technology from the library. Some of the trends of modern public libraries are:

Library as a social institute

Public libraries contribute to community development in a variety of ways, including providing free communal space, technological resources, and opportunities for people to cultivate imagination, creativity, and personal growth. It is also used to relieve isolation as it acts as a place for interaction among people. It acts as a meeting place and promotes community and building social capital. (Svanhild Aabø, 2012)

The library has potential as a meeting place across cultural, ethnic, and social lines. Public libraries are used as meeting places to a great extent, and a variety of meetings take place in them. Six categories of meetings were identified: the library as a community square,

where one accidentally bumps into neighbors and acquaintances, the library as a public sphere, that is, a place where people live out their role as citizens; the library as a place for joint activities with family and friends; the library as a meta-meeting place, that is, as a channel to identify other social arenas and organizations in the community; and the library as a virtual meeting place. The library has evolved into a complicated public space, with behaviors used by library visitors and employees reconstruct the area to meet their needs. This has been referred to as social capital, and is one of the building blocks of a strong community. Research highlights that social networks have value and affect the productivity and health of individuals and groups. For all users, public libraries can provide a safe haven, where people can feel a part of the broader community. (Svanhild Aabø, 2012)

Libraries: public space for private purposes

The main finding is that the library stands out as a public space primarily, in the sense that it is accessible to anyone and that the majority of visitors are strangers to one another. However, due to the nature of the activities that users participate in, it functions as a private environment. Users come to the library with specific tasks related to their studies, jobs, or personal lives. In addition, the library includes three realms: public, parochial, and private. (Svanhild Aabø, 2012)

Friendship groups, typically adolescents, playing computer games or utilizing social sites such as Facebook, behavior that can be classified as using the library as a private world. However, it was regularly seen that users stepped outside of their private bubbles and used the library as more of a public realm, roaming around or resting for a few minutes in the newspaper room in the same manner that one might sit on a park bench. Similarly, families visit the library for numerous reasons and occasionally meet acquaintances and neighbors, making the library a parochial realm. Thus, perhaps the most significant feature of a public library is the ability to freely move between these realms. An important finding is that the library is characterized as a public space used for private and individual projects. Some chance encounters with friends and neighbors, entering conversation with strangers, and encounters with people different from oneself—that is, a certain degree of communication and interaction, makes library as a public space. (Svanhild Aabø, 2012)

Library as part of public sphere

The public sphere is the area in which various ideas and viewpoints are exposed to the public, and where citizens develop their civic skills. That duty is fulfilled at public libraries in part through organized lectures and meetings, and in part through users being individually exposed to topics and ideas in public debate or consciously seeking information to qualify as citizens. Most observed uses in the library are related to work, studies, or to the private sphere. The library opens, however, for moving between spheres, and in some instances, users were observed combining private use with using the library as a public sphere. (Svanhild Aabø, 2012)

Library for joint activities

The library even functioned as a place for conducting joint or group activities. Friends, classmates, or colleagues meet together to work on a common assignment and family members also spend time together learning activities or joint hobbies. The form of

interaction occurring for various activities mainly were seen to vary on a scale from intense interaction (e.g., several children playing computer games together) to low interaction (a married couple spending an hour or two reading books and walking around in the library, partly together, partly individually). Thus, the library provided a space where different forms of interaction occurred among the people while performing varied activities. (Svanhild Aabø, 2012)

Although some people prefer to study in peaceful areas, they also take breaks and wander around the library, noticing and recognizing otherness among the users. To study in a productive environment with people of all ages, nationalities, backgrounds, and goals appears stimulating—and recognizing otherness appears to be a vital element. (Svanhild Aabø, 2012)

Library as a community living room

Libraries have embraced the role of the ‘third place’, understanding that people seek refuge in libraries or choose to spend many hours in them for a range of reasons, and now provide settings for this to occur (Oldenburg, 1989).

The notion of libraries as community living rooms signifies a departure from the function and atmosphere of libraries of the past. Floor space, once dominated by the collection, is gradually being converted to living spaces and social hubs – comfortable areas to relax and socialize. Like public squares and street cafes, a modern public library provides a place which puts users at ease, a place of mutual respect for people to meet and pass time, in addition to its core information services. (Svanhild Aabø, 2012)

A living room library caters for a broad spectrum of user preferences, including spaces to “chill out”, drop in, plug in, login, meet up, read a magazine, listen to music, buy a coffee. In addition, there is a variety of different spaces on offer – quiet contemplative nooks, places by the window, or seats near bustling thoroughfares.

Collaborative learning environment

As a result of the trend towards collaborative learning, public libraries have shifted from ‘silent reading’ and individual study models of the past, towards active and interactive learning environments.

- Key elements of collaborative learning spaces include:
- Group study areas
- IT enabled lounge and study
- A variety of attractive and flexible furniture arrangements that allow users to customize their own spaces
- Convenient access to WIFI and power points

2.1.8 Spaces in Modern Library

Spaces in modern libraries have changed over time in a way that is strongly related to how society has changed. Libraries' settings couldn't remain unchanged in the face of the widespread of electronic information and the evolving profile of information users.

Public libraries around the world are evolving and becoming more multifunctional, which also means that their service values and content are changing. Public libraries are being turned into "problem solving centers," "business information centers," "community engagement centers." Additionally, public libraries' "space" is used for a variety of activities, including third places, places for high- and low-intensity meetings, and gathering places for a variety of people. Public libraries are being used as areas for kids to learn in, places to meet, and places to work. As a result, in order to develop communities in the 21st century, public libraries must reinvent themselves as "community-centered" institutions. (Md. Abul Kalam Siddike, 2014)

2.1.8.1 The four-space model

In the mid-1990s a Danish survey of the position of the local library described a model for the library's profile. The model was to be viewed as both an analysis model for the library's real activity and a tool for prioritization on behalf of the local library. According to the model the library's overall objective is to support the following four goals:

1. experience;
2. involvement;
3. empowerment; and
4. innovation.

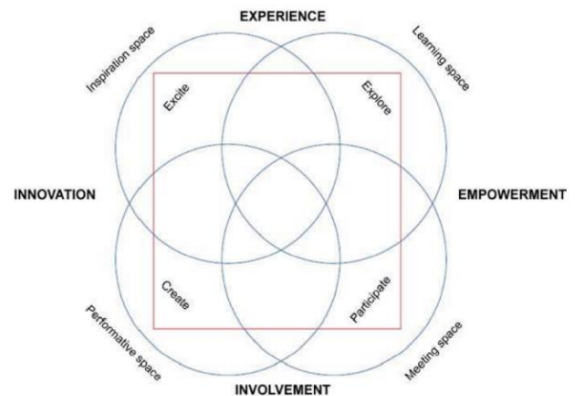


Figure 9: Four space model

Whereas the first two aims are particularly concerned with an individual's perception, experience, and involvement in his or her search for meaning and identity in a complex society, the other two objectives support social goals to a greater extent. Empowerment is concerned with the creation of strong and empowered people capable of solving everyday difficulties, whereas innovation is concerned with finding innovative solutions to practical problems or generating whole new concepts, methodologies, or aesthetic expressions. Both are critical if states are to survive in a globalized world. It is particularly intriguing to investigate how libraries may inspire and promote creativity and innovation as a competitive dimension. (Henrik Jochumsen, 2012)

The library can make a contribution by making space for learning, experience, engaging meetings, and possibilities for expressing oneself in a creative way. These things cannot be considered in isolation and individually, but must be seen as overlapping functions that interact in the library space both physically and virtually. (Henrik Jochumsen, 2012)

The model illustrates the opportunities for participation, learning, experiencing, and creation that the new library must provide its patrons. The four-space model thus comprises a vision for the library that consists of four separate overlapping "spaces":

1. inspiration space;
2. learning space;

3. meeting space; and
4. performative space.

The ultimate goal is to integrate all four spaces through the library's architecture, design, services, programming, and partnering choices.

i. Inspiration space

This is the space for meaningful encounters, or those that change our perception. This can be accomplished through storytelling and other artistic expressions in all mediums, cultural patterns, and genres. The inspiration area should inspire you to explore beyond your usual choices, and as such, it must also allow for the irrational, emotional, and chaotic by mediating a wide range of aesthetic experiences. It is understood that the public library has always been a place of inspiration, whether for education, enlightenment, or social mobility, or for leisure activities and the user's demands for enjoyment and interests in general. (Henrik Jochumsen, 2012)

ii. Learning space

Experience and empowerment are especially supported by the learning space. This is the place where children, youth, and adults may discover and explore the world, increasing their skills and possibilities via unrestricted access to information and knowledge. Learning in the library is always an opportunity. It occurs through play, artistic pursuits, classes, and a variety of other activities. The strength of the library is that learning is viewed as a dialogue-oriented process that begins with the users' own experiences and their desire to define their own learning needs, and that it takes place in an informal or formal setting. (Henrik Jochumsen, 2012)

iii. Meeting space

The meeting space is an open, public location placed between work and home where citizens can meet others who are similar to them as well as different from them. In a segmented society, you need places where you can meet individuals who have different interests and values than you and hear perspectives that challenge you through conversation and debate. The meeting space provides the framework for non-committal, unplanned gatherings in both small intimate spaces and lounge areas with newspapers and cafe' amenities, as well as for more organized meetings where subjects and problems can be explored and addressed. Meetings can take happen both in person and online via chat groups, blogs, and other social technologies. (Henrik Jochumsen, 2012)

When discussing the library's potential as a meeting space, the term "third places" is frequently encountered. A third place is one where individuals of different generations, cultures, and ethnic backgrounds can meet. The concept can be traced back to American sociologist Ray Oldenburg (1999) and his book *The Great Good Place*, in which he explores the various public venues where individuals can congregate and put aside their cares about home and work. These locations, according to Oldenburg, are the center of a community's social vitality and the foundation of democracy. A good example of a library that provides space for meetings is the main library in Seattle. This library serves as a tremendous living room for both visitors and inhabitants in the city where you can meet, socialize or just relax. (Henrik Jochumsen, 2012)

iv. Performative space

Participation and invention are especially supported by the performative space. In the performative environment, users can be motivated to produce new artistic expressions in the encounter with art and culture through interaction with others. They have access to resources that support their creative endeavors through interactive games, writing, sound, and video, as well as workshops with professional artists, designers, multimedia developers, and so on. A way to create a performative space is traditionally by providing different stages for events within the library or by having exhibition areas on different levels. (Henrik Jochumsen, 2012)

2.1.8.2 Important spaces in a modern library

Modern libraries demand variety of spaces due to the changing society and the users.

i. A social space for interaction and knowledge exchange

People prefer working together on various projects; therefore, they frequently visit libraries in groups or with their families to socialize and play. For this reason, a modern library must also design a setting where users can freely absorb information, think about it, converse about it, and come up with new thoughts, discussions, and possibilities as a result. (Paraschiv, 2017)

ii. A quiet place for contemplation

The library has served as a sacred place for information consumption for ages. Traditional library services, where the main goal was to acquire as much knowledge as possible, placed a strong emphasis on quiet reflection. The library is no longer the only place where people may obtain knowledge today because they always have access to information. However, when library users are questioned, it becomes clear that three out of four say it is "extremely vital" for the neighborhood that public libraries continue to offer peaceful study spaces for both adults and kids (survey run a few years ago by Pew Research Center). Since there are so many distractions in today's world, individuals nevertheless value the idea of a peaceful place where they can read a book or use a digital resource, organize their thoughts, or work. Offering a quiet space in addition to a sociable space is crucial. (Paraschiv, 2017)

iii. A maker space for innovation

One key demand of the user is to make more space for them, not for the books. People desire to share their experiences with others in addition to learning new skills and how to use contemporary technologies. At this way, makerspaces in libraries have been popular in recent years. A makerspace is a physical area where people congregate to share resources and expertise, work on projects, network, and construct, according to Samatha Roslund's book Makerspaces. (Paraschiv, 2017)

iv. A neutral and trusted space for public use

Compared to other forms of cultural expression, libraries cover a significantly wider spectrum of age groups and social backgrounds. As a result, the library has a different meaning for every one of us. It can be a tranquil setting for professionals to do insightful work, a playground for families, or even a resource for those with less resources, among

many other things. However, there is one thing about which everyone can agree: the library is a safe and impartial public area. (Paraschiv, 2017)

2.1.9 Major Departments of A Library

There are two main divisions in a library: the front office and the back office.

- The front office is what the public sees. Reference, circulation, events, etc. The staff is there to help you use the libraries resources and facilities to achieve your goals.
- The back office makes these resources available. This area is often called “technical services”. The largest portion of the technical services is cataloguing, where new items are prepared for shelving.

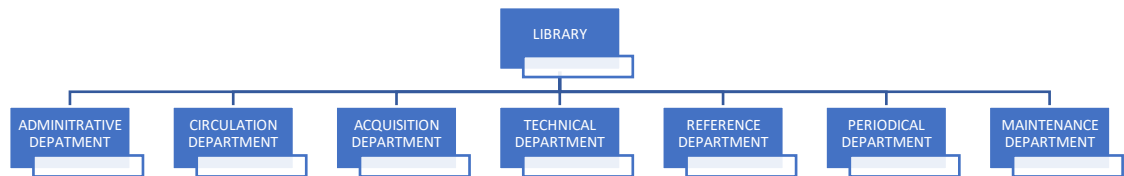


Figure 10: Different departments in library

2.1.9.1 Administrative department:

Managing a library's operations and other activities while also making critical decisions is characterized as library administration. The daily administrative tasks that keep the library running efficiently are handled by library administration departments. These responsibilities include keeping records of library staff members' employment and timekeeping information, paying bills for services rendered to the library, creating and maintaining budget reports for the library, ordering supplies for the library and its employees, and maintaining the library's physical assets. In order to oversee the overall library operation, the library manager and assistant manager will also probably have an office in the back. Both the front office workers and the technical services team are managed by this division. (Library and information science)

2.1.9.2 Circulation department:

Libraries' main duty is to circulate books, i.e., to let patrons check out books to read at home, to issuing and returning books at the circulating counter, circulation requires keeping records of the books that are borrowed, to whom they have been lent, for how long, etc. This Section deals with work relating to user needs, issue and return work, and membership work. Work involving circulation is typically performed on a specially constructed circulation counter. (Library and information science)

2.1.9.3 Acquisition department:

The selection, ordering, accessioning, and processing of books are under the responsibility of this department. Three things influence book choices: supply, demand, and finances. These variables must therefore be the primary considerations in planning before acquisition. The primary criteria for choosing books include statistics on how often they are checked out and circulated from the library, recommendations from library workers who work in the service areas, and mainly suggestions from readers.

2.1.9.4 Technical department:

The newly acquired books are prepared for library use. For this purpose, these are classified, catalogued, entries filed in library catalogue and books shelved on display racks or in the stacks. (Library and information science)

The Technical Processing Section plays a key role in carrying out the functions of any library. The journey of every document in the library to reach its readers starts from the acquisition section. It is the acquisition section that acquires the documents and it is the technical section that prepares these for use by the users. The technical section, therefore, acts as a bridge between the acquisition of documents and their circulation.

The basic steps of technical processing of library material are as follows:

i. Classification:

Library materials are classified for several reasons. One reason is that it is difficult to find library material unless each item has a place to which it belongs. Another reason is that classification makes a collection browse-able by placing items on similar subjects together. (Library and information science)

The grouping of documents with the same or similar subject content is known as library classification. A categorization, or call number, is given by the cataloger in accordance with the subject headings. The Library of Congress Classification (LCC), Dewey Decimal Classification (DDC), Bliss Bibliographic Classification (BC), Universal Decimal Classification (UDC), Cutter Expansive Classification, and Colon Classification (CC) are a few of the popular classification schemes; DDC and LCC are the two most widely used.

ii. Cataloguing:

Making bibliographic records for things in the library's collection is the process of cataloguing. It used to be a very labor-intensive process back then. Libraries can now easily obtain bibliographic records from both commercial sources and other libraries because to advancements in computer technology. The effectiveness of a library's catalog greatly influences how its resources are used. As a result, it is crucial that the catalogue be carefully created and kept up to date. It aids patrons in making effective and efficient use of the library. The upkeep of the library's catalog is another important duty in cataloguing. The catalogue must be cleared of bibliographic records for missing items and objects that have been taken out of the collection. (Library and information science)

Presently, the following physical forms of cataloguing are adopted by most of the libraries:

- I. The card catalogues
- II. Computerized catalogue

Computerized library catalogs are the newest type of formatted, digital catalogs. Libraries have also tried to computerize all of their operations as a result of technological advancements. Users can find a systematic record and are spared time, energy, and effort. An online database of the items maintained by a library or set of libraries is known as the online public access catalog (OPAC), which is now frequently used interchangeably with the term "library catalog." Previously utilized in libraries, analog card catalogs have been mostly replaced by online ones. (Library and information science)



Figure 12: Card catalogue



Figure 11: Computer catalogue

iii. Processing:

After an item is catalogued, it must be prepared for use. Call number and barcode labels need to be affixed. Items need to be stamped with the library's name. Items also require protective measures. Book jackets are laminated or covered with a plastic cover. Audiovisual materials may need special containers. (Library and information science)

iv. Shelving:

It involves the act of organizing books by call numbers in sequential order and placing them in their correct locations on library shelves.

2.1.9.5 Reference department:

Numerous reference volumes are gathered and arranged by the Reference Section. Reference book is one which is not read like text book from beginning to end, it is referred to find the response to your particular question. A reference librarian oversees the section, and it is his/her job to help users find information in the library's resources for reading, research, and teaching. (Library and information science)

2.1.9.6 Periodical department:

The Periodicals Section compiles and arranges a variety of periodicals (such as, a journal, magazine, newspaper). A book is a one-time publishing; it is only ever printed once, whether in its original form or in later revisions and iterations. In contrast, a periodical publication (serial publication) is released continuously at predetermined intervals (such

as, daily, weekly, fortnightly, monthly, etc.). The most recent issues of a volume of a periodical publication are initially delivered to a library. The finished volumes can then be bound and arranged under the Periodicals Section. This department also determines which new publications are required. (Library and information science)

2.1.9.7 Maintenance department:

Maintenance work is the backbone of any object, structure, organization, institution and so much so, in a library also. In a library, Maintenance Section is responsible for jobs such as organization of collection, shelving and re-shelving, dusting and cleaning, mending and binding, weeding and stock verification. Much of the work done in Maintenance Section is behind the scenes which helps to keep the collection live and presentable for maximum use. (Library and information science)

Some of the activities done by maintenance section is:

- i. Organization of collection
- ii. Shelving and Re-shelving
- iii. Dusting and cleaning
- iv. Mending and binding
- v. Weeding
- vi. Stock verification

2.1.10 Core Ares of A Library

The main programmatic functions of entry, circulation, reference, staff, collections, and seating define the layout of library. These functions continue to shape the operations of all libraries, regardless of size or mission. Although the integration of digital capabilities necessitated alterations, these functions have stayed generally constant despite changes in library services. (Nolan Lushington, 2018)

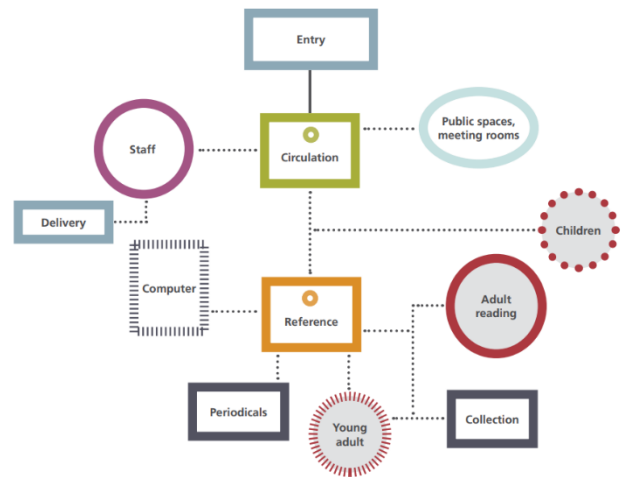


Figure 13: Typical adjacencies of core function elements

2.1.10.1 Service area

1. Circulation counter

The circulation counter is located near the main entrance of the library building. Most of the activities like issue/return of the books, reservation; fine/overdue clearance, reminders, inquiry are done here. There should be enough space to move about and the surface of the counter must be wide enough to work easily. Small drawers and lockers should be made for safekeeping the equipment used in the circulation counter. The proposed measurement of a circulation counter is 70-72” length and the surface area should be of 28” and the height 27-28” high.

2. Public catalogue area

The other important area in library is the catalogue cabinet. Its location should be near the circulation counter and reference area.

3. Reference area

This area must be located near the public catalogue, circulation counter and the main reading areas. The reference area is essential for information study that demands both physical and digital access. This should have a soundproof office space for the reference librarians and their staff.

4. Staff area

The staff section houses the staff offices as well as the common space needed for all technical activities connected to book processing, information technology, and computer assistance. It is connected to circulation, a staff entrance, and a delivery entry. The staff area also houses the librarians' offices and common areas, which are normally entered through the staff door.

2.1.10.2 Collection area

The public library should provide equality of access to a range of resources that meets the needs of its users for education, information, leisure and personal development. The collection, which is a basic function program element, includes a wide range of materials, including books, magazines, paperbacks, CDs, DVDs, and, more recently, electronic books. Some collections have become virtual as a result of digitization, appearing as electronic or scanned documents. (Nolan Lushington, 2018)

Shelving layout

The amount of space needed to house a collection depends on the type of media. The dimensions of the kind of media that a shelving unit is intended to hold determine its capacity, which is determined by its width, depth, and height as well as whether it is single-faced or double-faced. (Nolan Lushington, 2018)

The types of books shelves are:

- i. Single side rack
- ii. Double side rack
- iii. Skeleton book rack
- iv. Periodicals/Journal rack

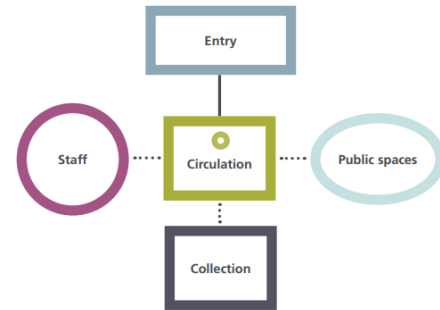


Figure 14: Typical movement flow in reference area.

Source: (Nolan Lushington, 2018)

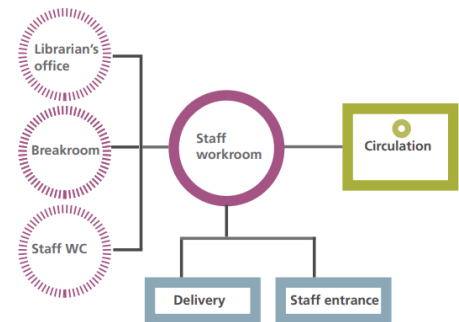


Figure 15: Typical movement flow in staff area.

Source: (Nolan Lushington, 2018)

Table 1: Capacity Schedule for Common Multimedia, from library stacks and shelving

Cantilever-style Steel Shelving		
Media Type	Shelf Depth	Units per linear foot of shelf
Audio Cassette	8-10"	19
CD/CD ROM/DVD	8-10"	30
Audio Book Cassette	10"	10
Video Cassette	10"	10
Current Magazines	12"	1
Current Newspapers	12"	1

Table 2: Capacity Schedule for Common Print materials, from library stacks and shelving

Cantilever-style Steel Shelving		
Volume Type	Shelf Depth	Units per linear foot of shelf
Encyclopedia	12"	6
Legal	12"	7
Medical	12"	5
Public Documents	12"	5
Reference	12"	6
Technical and Scientific	12"	6
Textbooks	12"	8
Fiction	10"	8
Large Print	10"	8
Literacy	10"	24
History	12"	8
Non fiction	12"	10

Types of shelves based on height:

Low-height shelving

Although it is not the most effective method for storing collections, low-height shelving has some benefits, such as better sightlines (seeing over rather than between shelves). It is frequently utilized in kid-friendly areas and busy places where sightlines are crucial. Casters are advised for this kind of shelving.

Mid-height shelving

A reasonable balance between capacity and usability is offered by four- and five-shelf tall units, especially if the bottom shelf is raised to prevent empty bottom shelves. At this height, casters can still be used if mobility is desired.

High height shelving

The appropriate places for this shelf are designated collection spaces without a lot of built-in seats. To provide improved sightlines and movement (while browsing and reshelving), it could be advantageous to extend the distance between the shelves.

Wall shelving

Wall shelving give the appearance of a "wall of books" and can be a useful method to utilize the space between windows. The height of this shelving is only limited by the ceiling height and the ability to access the shelves.



Figure 16: Low height shelving with casters



Figure 17: High height shelving

Free-form and display shelving

In order to give consumers flexibility, free form displays are typically used in dedicated spaces where books and other content are displayed.



Figure 18: Free-form shelving

Table 3: Recommended Shelving Height for common print collections, from library stacks and shelving

Volume Type	Height
Reference	66"
Reference (High/ Low)	42"/90"
Adult Fiction	90"
Adult Non-Fiction	90"
Easy Readers	42"
Juvenile Fiction/Non-Fiction	66"
Young Adult	66"
Large Print	66"/78"
Current Periodicals	45"/66"

2.1.10.3 Study area

Reader seats are an essential building blocks of any library environment. The traditional reading room has made way for community "living spaces" as libraries redefine their identities. The majority of public libraries still have reading rooms, but they are typically small and unofficial. Table seating, which was formerly mostly found in the reading room, is now present throughout the whole library. (Nolan Lushington, 2018)

Some of the common forms of functional study areas are discussed below:

- Main study lounge
- Periodicals study area
- Individual study carrel
- Collaborative study area

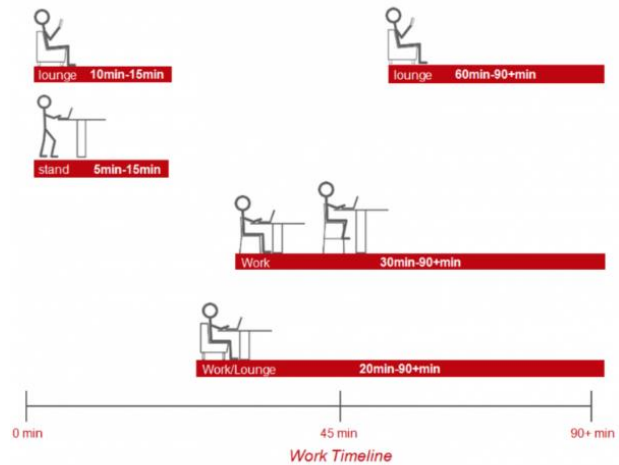


Figure 19: Seating style with time spend on tasks, Library furniture, Library seating series by Lizzie Hoffman

Seating types

Reader seats are a fundamental component of any library setting. Consider 25 to 35 square feet to be the average for all forms of seating when making planning assumptions. The degree to which a certain form of sitting encourages collaboration and socializing or privacy and concentration is a useful approach to think about. The availability of several seating options, such as low armchairs, ergonomic task



Figure 20: Soft seating



Figure 21: Hard seating

chairs, and hard-backed chairs, increases accessibility and comfort for a variety of users and activities. (Massachusetts Libraries: Board of library commissioners, 2020)

The monitor and the laptop have been integrated into the library's sitting as a result of the use of digital technology. The sitting, the surface, and the positioning of the monitor itself are all significantly impacted by adjustability and flexibility concerns. With the availability of Wi-Fi in most libraries, the function of the general table seating, too, is expanded for laptop use. (Nolan Lushington, 2018)

Individual seating

Many users choose to sit alone in areas that support concentrated study or casually browsing while surrounded by others. To allow for flexible use by various users and to provide some degree of personal space, this style of seating is frequently offered in groups of two or more seats.



Figure 22: Individual seating

Carrels

The classic study carrel supports a person's needs for private study and is modeled after the monastery scriptorium. The study carrels in Louis Kahn's 1971 Phillips Exeter Library in New Hampshire are characterized by their ideal qualities of natural sunlight, lots of workspace, and solitude.



Figure 23: The study carrels at Louis Kahn's 1971 Phillips Exeter Library in New Hampshire



Group seating

Small group collaboration meetings are becoming more and more popular in libraries, especially among students and teenagers but also among adults. The idea is to have furniture that can be altered to fit the demands of various size groups. Group seating can be placed close to areas of the public that are typically noisier and livelier.



Figure 24: Group seating

2.1.10.4 Special use spaces

Index tables, newspaper racks, pamphlet folders, microfilm readers, and photocopiers are some examples of special use equipment. Dedicated stations for self-checkout activities are another application that falls under the category of special use space that more and more

libraries are looking to accommodate. Special use space now makes up a larger portion of the total, or gross, space of a typical public library due to the growing desire among libraries to include amenities like a refreshment nook, library café, or small group study rooms. At a minimum, special use space will likely occupy about 12% of the gross area of the library building. A moderate allocation will be in the range of 15% of the gross area of the building, while an optimum, generous allocation will be about 17% of the gross area of the building. (Dahlgren, 2009)

2.1.10.5 Non-assignable space

The area of a building's floor that cannot be directly used for library services is known as non-assignable space. Furnace rooms, janitor's closets, telecommunications closets, storage rooms, vestibules, corridors, stairwells, elevator shafts, and restrooms are a few examples of non-assignable space types. Although this area is required for building operations, it cannot be used directly for library services. Non-assignable space generally comprises about 25 to 30 percent of the gross square footage of the finished building.

2.1.10.6 Other functional spaces

There are many other spaces in the library which are required for its proper functioning. Some of them are:

Entrance

The entry area is the key link between the many components of the library, particularly the circulation area and the public spaces. It also serves as a link between library functions and public and social ones. (Nolan Lushington, 2018)

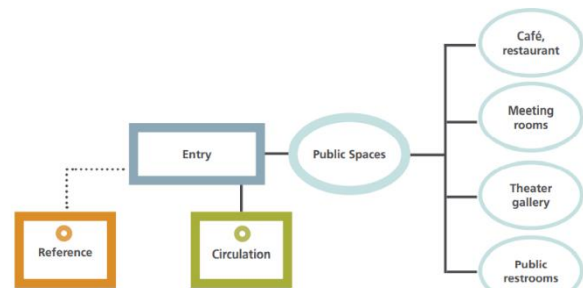


Figure 25: Typical movement flow in entry area.

Source: (Nolan Lushington, 2018)

Meeting space

Many public libraries incorporate meeting space for library- and community- sponsored meetings or events. It also serves as training space for staff or library patron. Meeting spaces must be close to the entrance and, ideally, be functional even when the library is closed. This space can also double as a display or gallery space.

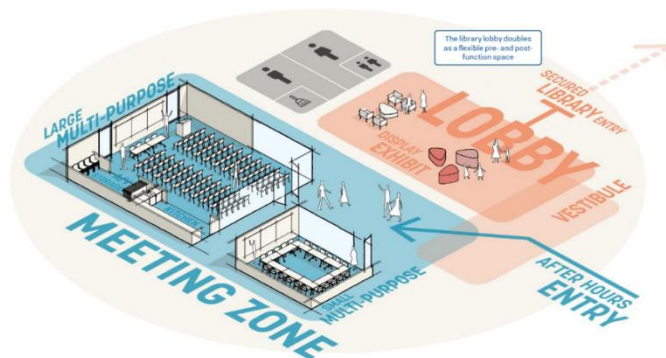


Figure 26: Meeting zone, from Library space: a planning resource for librarians

Multipurpose hall

The multipurpose room will be used for a variety of social activities. In order to create a pleasant and comfortable environment that promotes social interaction, the area should be visually appealing. A multipurpose area may need to handle a wide range of activities, such as eating, watching plays or movies, attending assemblies or community events, teaching big groups of people, and more. (Butin, 2010)

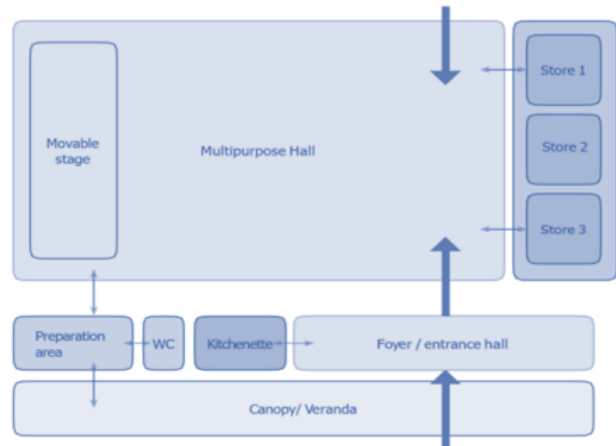


Figure 27: General plan of Multipurpose Hall

Space requirement: If the multipurpose space will be used as both a theater and a cafeteria, allow 10-14 square feet per person for dining and 7.5 square feet per person for performance seating. Following is further discussion on balancing sometimes-conflicting factors for optimal performance across multiple use needs:

- i. **Location:** The multipurpose space should be located next to other public spaces and be acoustically separated from instructional areas.
- ii. **Integrating technology:** The multipurpose space should be able to handle several forms of technology. Video, data, and electrical outlets should be spaced along the perimeter of the space, as well as at the edge of the stage.
- iii. **Finishes:** Flooring can be done using resilient sheets, resilient foam-backed sheets, wall finishing can be done using a variety of finishes to give acoustic variation i.e., painted plasterboard, timber paneling, timber slats with acoustic absorbent backing, plywood.
- iv. **Acoustics:** As just indicated, acoustic treatment can be one of the most difficult balancing acts for multipurpose spaces. Walls and ceilings should incorporate proper acoustical treatment. Room configuration is also important, such as a multi-tiered ceiling that can enhance acoustics.
- v. **Lighting:** More than one lighting system may be required in the multipurpose space. In addition to serving meetings and dining events, the lighting system may be required to handle performances and multimedia presentations. Performance lighting might require spotlights, light controls, and a dimmer system. Plus, windows and skylights should have shades so that the space can be darkened adequately.
- vi. **Seating:** Requirements for seating in a cafeteria is drastically different from both performance and lecture hall uses. Seating for sports events and dramatic presentations can be handled with built-in bleachers that pull out from alcoves along the walls. Moveable tables and chairs can accommodate cafeteria and large-scale teaching/testing use in that same space, preferably with a podium from which

the teacher or rector can be readily seen. Plan also for adequate chair and table storage.

- vii. **Ventilation:** For all uses, clean air and circulation of outside air are vital elements of a healthful indoor environment. (Butin, 2010)

2.1.11 Space For Different Age Groups

The public library is a place with unique energy. Individuals gather peacefully to gain access to information and to share in a community place. Through the building of libraries that are created as dynamic community institutions and the design of space that is especially appealing to children and teens, architecture adds to the message societies want to send to their own and future generations. Integrating the educational, social, and developmental stages of childhood and adolescence with creative and well-thought-out designs can enhance learning, discovery, and exploration. Modern library space supports learning through movement, play, art activities, media, technology, group study, homework assistance and tutoring, drama, writing, child-to-child and adult-to-child conversation, and peer networking. A welcoming public library with special spaces for children and teens has great potential to influence individuals and society in a positive way. (Sandra Feinberg, 2010)

2.1.11.1 Space for children

Modern library design is based on the guiding notion that "children must adore it." They are more likely to continue using libraries their entire lives after they become accustomed to such settings. Children's spaces can no longer be an "add-on," according to librarian Ayub Khan. Instead, they must be an essential part of the library experience. Although the first public libraries did not specifically cater to children, they soon did, both in terms of designated space and book stock. In 1895, the Boston Public Library became the first to develop a section with more than 3,000 children's books that was exclusively for children. Through the third decade of the 20th century, children's rooms changed, children's rooms were frequently shelf-lined rooms with small furniture, finishes in primary colors, and juvenile literary wall art until the 1970s. (Worpole, 2013)

The modern standards for children's library design emphasize learning through hands-on activities. As shown in the OBA - Openbare Bibliotheek Amsterdam, there is no longer an implicit requirement that vibrant colors be used to create an engaging environment for youngsters. The children's area is distinguished from the rest of the library's plain white aesthetic by the use of whimsical, geometric white forms like the curving bookcases and jack-like light fixtures. A monochromatic background is boldly contrasted by random accents of color. (Nolan Lushington, 2018)



Figure 28: Youth section of the OBA – Openbare Bibliotheek Amsterdam. Use of playful, geometric forms, the curving bookshelves distinguishes youth area

Source: (Nolan Lushington, 2018)

Some libraries also include craft sections with tables and chairs, washable floors, and space to exhibit paintings and artwork. The new C.L.R. James Library in Hackney, London, has a "wet area" where kids can play with water and art supplies. It also has a small tiered seating area for story-telling. (Worpole, 2013) In public libraries with ample space, the children's area may include a story-time room, as well as a special activity room for arts and crafts programs. Activity rooms usually have an easy-to-maintain vinyl floor and are furnished with height-adjustable folding tables and stacking chairs. Rooms designed for arts and crafts activities often include a sink and lockable cabinets to hold programming materials.

Learning through play

Beyond aesthetic considerations, children's libraries are built with education in mind. In the past, the children's room was used mostly as a container for storytelling events focused toward very young children. More modern designs of children's spaces break this tendency and put the emphasis on them as learning spaces. This mentality supports the idea of learning via play, which is developed from late 1970s child development theories. The children's library at Ordrup Bibliotek in Copenhagen encourages users to explore by physically climbing over the books by using shelving units of various heights as a stepladder. (Nolan Lushington, 2018)

To create cozy environments for kids and caregivers, seating may be arranged in groups or clusters. Zones can also be established using things like carpeting, ceiling heights, colors, lighting, and graphics. Young children require unrestricted areas that they can safely explore. Nooks, crannies, and partial enclosures offer secure boundaries for play, creativity, and language development. Youngsters enjoy small, cozy settings, and if they are appropriately constructed, the layout and structure of the room can also aid children in understanding the suitable behavior for the library. (Sandra Feinberg, 2010)



Figure 29: The children's library at Ordrup Bibliotek, Copenhagen, Søren Robert Lund Arkitekter, 2007, encourages users to explore by physically climbing over the books. Source: (Nolan Lushington, 2018)



Figure 30: Hjørring Library

2.1.11.2 Space For Teens

More and more libraries also now distinguish a teen area, another staging post between children and adult sections, where the growing literature especially designed for teenage readers (including graphic novels) is to be found. Such areas also incorporate study desks and computer terminals. Teen library spaces should be designed to fulfill the concept of the library as "destination" by providing a safe, comfortable place for young people to hang out. (Worpole, 2013)



Figure 31: The Teen Center at the Hamilton Grange Library in New York. Source: (Nolan Lushington, 2018)



Figure 32: Vennesla Kulturhuset, Vennesla, Norway, Helen & Hard. Source: (Nolan Lushington, 2018)

The design of teen or young adult spaces has grown to reflect a sophisticated contemporary style with super graphics, contemporary colors, whimsical patterns, and "mod" pieces of furniture, similar to how children's rooms have done. Individual study and research can be accommodated by tables, computers, and occasionally study carrels. Grouped lounge seating enables both socialization and collaborative studying. As a response to such a challenge, the Hamilton Grange branch of the New York Public Library in Harlem (2012), with a new teen space was designed to encourage chaos, loitering and even eating. The space is entirely open, occupied only by two low objects: an inhabitable, glass vitrine for playing video games and a set of bleachers that conform to a multitude of seating options. By incorporating aspects that foster a setting where teenagers feel welcome and special, design may support the success of the teen space. (Nolan Lushington, 2018)

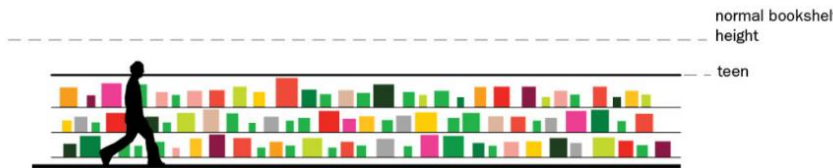


Figure 33: Lower shelf height for teens



Figure 34: Comfortable seating for teens

2.1.11.3 Special Population

Universal Design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability. Barrier-free environments allow all users, regardless of physical limitations, to enter, use, or access resources whenever and however they like. The setting of the library, including the building, furnishings, and learning resources, should be open to everybody. To meet the information demands of all users, the library building, its departments, and other spaces and amenities (such restrooms, drinking water locations, and staircases) should be thoughtfully designed. (Protap Chandra Roy)

Designing the library for visually challenged

- a. **Infrastructural facilities:** There should be appropriate signs inside and outside the library facility. The entrance should provide adequate lighting for people with

low eyesight. Various areas of the library building must also be indicated by audio signals. When there are elevation changes on sidewalks, corridors, or parking spaces, ramps should be available. Handrails must be installed on both sides of all stairs, ramps, and walkways. A handrail can help people stay balanced and stop serious falls. They can better perceive direction changes with continuous handrail. Elevator facilities should be included if the building has more than one story. (Protap Chandra Roy)

- b. **Talking zone:** A talking area where official reader service can be offered should exist. When necessary, trained library staff members can read out the relevant information to individuals who are blind or visually impaired. These particular users can access the resources here by using a variety of audio medium as well.
- c. **Alternative formats of resources:** The three alternate print formats that are most frequently utilized are spoken word, embossed print, and enlarged print. Speaking books, newspapers, and magazines on tape are all examples of spoken word media. A special AV room can be provided for them to use different resources. DVDs, streaming video, CDs, and many more audiovisual items are maintained and made available to users in this section. They might also offer equipment like record players and VCRs that can be utilized to play these materials. (Protap Chandra Roy)

2.1.12 Design Qualities of A Library

Andrew McDonald’s (Library and Learning Services) new list of nine rather than ten qualities, based on a revision of those proposed by Faulkner-Brown (architect) are as:

- i. **adaptable** – flexible space, the use of which can easily be changed
- ii. **accessible** – social space which is inviting, easy to use, and promotes independence
- iii. **varied** – with a choice of learning environment and between different media
- iv. **interactive** – well-organized space which promotes contact between users and services
- v. **conducive** – high-quality ‘humane’ space which inspires people
- vi. **environmentally suitable** – with appropriate conditions for readers, books and computers
- vii. **safe and secure** – for people, collections, equipment, data and the building
- viii. **efficient** – economic in space, staffing, and running costs
- ix. **suitable for information technology** – with flexible provision for users and staff. (Planning Public Library Buildings)

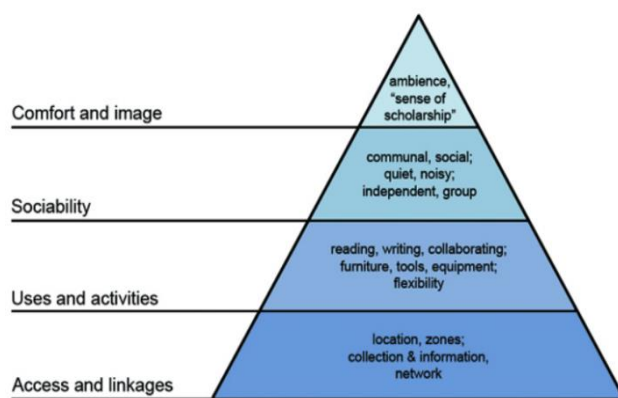


Figure 35: Hierarchy of learning space attributes. Source: Cunningham, 2012)

2.1.13 Designing Library Interior

List of space attributes representing quality of physical space:

Table 4: Space attributes representing quality of space

CATEGORY	SPACE ATTRIBUTE
Space Layout	Accessibility To Facilities Ease Of Interaction Amount Of Space Privacy
Space Furnishing	Adjustability Of Furniture Comfort
Thermal Comfort	Air Movement Temperature
Space Ambience	Aesthetic Appearance
Lighting	Amount Of Light Visual Comfort (Glare, Reflection, Contrast)
Acoustic Quality	Noise Level Sound Privacy

2.1.13.1 Acoustic quality

Though the days of ‘silence in the library’ are long behind us, balancing social, interactive spaces with the need for quiet study remains a challenge. The design of good acoustics in libraries, contrary to popular belief, is not to lower noise levels, but rather to enable effective communication in areas where it is required, and reduce disruption in areas where concentration and quiet contemplation are needed. (Denelle Wrightson, 1999)

The exterior noise can be reduced by planting trees, shrubs at desirable areas. Interior noise may be due to movement of materials, users' loud talk, operation of electronic goods like computers, photocopy machine, air conditioner etc. Although quiet areas in libraries remain, library users and staff now talk out loud to each other on a regular basis in the public areas of all types of libraries. Computers and printers add to the noise level of a library; children are allowed to act like young people in their designated area; and in areas where the collaborative use of computers is encouraged, conversations occur.

Acoustic design issues for libraries involve the following principles:

- Site noise consideration
- Noise generation form different types of spaces
- Room acoustic consideration
- Vibration control for mechanical equipment
- Audio/Visual system consideration

Although traditionally places of silent reading, modern libraries also serve many other functions today, and careful design can be used to ensure that different spaces allow

different sound levels without disturbing adjacent areas. Cafes, meeting rooms, children's areas, photocopier machines and computer suites are all gathering places where people need to talk and the spatial configuration of the library should be designed accordingly. This is especially the case where atria, light-wells or open voids are used in the design, increasing sight-lines and visual connectivity, but also potentially allowing sound to travel - or even become amplified - from one part of the building to another. (Denelle Wrightson, 1999)

Wrightson identified three categories of acoustical problems that may occur in libraries: **intrusive noise** or noise that is not wanted in a particular space (such as noise from adjacent meeting or activity rooms), **overly reverberant spaces** (such as spaces with vaulted ceilings), and **lack of speech privacy**, especially in staff areas.

Intrusive noise in a building may be controlled by the grouping of spaces and by the layout of rooms within the library. Architects have traditionally grouped noisy elements of a building next to other noisy spaces. Sometimes large bookstack areas where little conversation occurs serve as a buffer between a noisy area such as the reference center and a quiet area like the periodical reading area. In order to keep the noise of a children's area from annoying adults, children's areas are usually placed in a different wing of a library from adults, placed on a different floor of multistory libraries, or separated from adult areas by glass or walls. (Denelle Wrightson, 1999)

A library will cater for many areas, including book stock, staff and study areas, meeting rooms or pods, collaboration areas and even, in some cases, auditoria or multimedia hubs. Tasks that are sensitive to sound and disruption should be isolated, in as much as is practical, from others that might cause disruption. Controlling the overall reverberation within the space is very important as excessive reverberation can lead to a build-up of noise levels when people are talking simultaneously, resulting in an uncomfortable environment. (Denelle Wrightson, 1999)

Overly reverberant spaces may be avoided by consideration of acoustical treatments in building design. The materials used on walls, floors, and ceilings; the location of doors and windows; and the acoustical treatment of ductwork all affect sound control in a library. Hard, reflective surfaces on walls, floors, and ceilings result in a noisy space. Architects and interior designers are responsible for selecting building materials and architectural elements that will provide adequate sound control in a library. (Denelle Wrightson, 1999)

Bookcases diffuse and absorb a number of the sound waves that pass horizontally through the space. All those books also add a good deal of mass and density to the walls, keeping sound transmission through the walls to a minimum. Each library is unique, but there are some attributes that are common to most. One is the high ceiling. The problem with high ceilings is that they allow sound waves to travel farther, creating a perfect venue for echo and reverberation to build. Luckily, there are some great

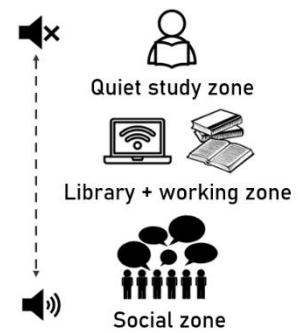


Figure 36: Vertical organization for noise level

ceiling design options that will help reduce noise and look fantastic, for example: coffered ceilings, microperforated panels, etc.

Places where people go to study or concentrate, on the other hand, should be constructed to minimize sound. Baffling in the ceiling or walls might minimize sound from bouncing around a room. In multi-level buildings noise should diminish as readers move upwards in fewer numbers through the building to more specialized service. (Denelle Wrightson, 1999)

- Sound Absorption Options for Libraries: Absorption Panels, Acoustical Foam
- Sound Blocking Alternatives: Soundproof Curtains, Door Seals and Sweeps



Figure 38: Acoustic wood wool ceiling, sustainable solution for acoustically outstanding spaces



Figure 37: Use of microperforated wood panels on ceiling

2.1.13.2 Lighting

Visual comfort is intrinsically related to light, to light's interaction with architectural space, and the properties of materials employed in forming the spatial membrane. Sufficient light levels must be provided for the users to be able to write on horizontal and read on vertical surfaces such as bookshelves. Design consideration may include avoidance of all forms of glare, excessive sunlight penetration and too high or too low contrasts. The appropriate use of natural and artificial light and how the two affect the ambience and appeal of the library, as well as providing satisfactory levels of illumination for particular tasks need to be understood. (Nolan Lushington, 2018)

General Lighting Requirement for Libraries (Illuminance levels)

The goal of lighting in libraries is to facilitate the learning experience by providing adequate and comfortable light levels that can be endured for prolonged periods of time. The main visual tasks in libraries are reading and writing texts, differing in size, shapes and contrast levels. Reading tasks may vary from children's books printed in 10- to 14-point type on matte paper to newspapers printed in 7-point type fonts. Other tasks, such as studying illustrations and handwritten pages varying in contrasts are possible. An illuminance level of 300–500 lux is recommended for reading rooms. For the general reading area, it is also recommended to have uniform lighting in order to allow for flexibility of use of the space.

Table 5: Recommended illumination levels at table height, (Nolan Lushington, 2018)

Reading room	Option 1 General lighting supplied over the entire area Option 2 Low-level lighting supplemented by local task lighting	300 lux
Individual/Group study rooms		300 lux
Carrels	Task lighting depending on configuration and location	500–1,000 lux
Auditorium/Lecture halls	Adjustable to multi-functional program	varies
Class rooms/Computer/Media labs		300–500 lux
Arts and craft spaces	Daylight color rendering of light source recommended	300–500 lux
Children's program rooms	Ambience adjustable to activities ranging from reading to play and craft	varies
Collection areas: active stacks	Vertical surface illumination of stacks Canopy lighting Parallel/perpendicular lighting above ranges Spotlights for highlighting specialty books/themes 80 lux measured vertically at floor level	80–350 lux
Collection areas: inactive stacks	Measured at 75 cm above floor	50 lux
Archival collections/Rare books	Illuminance values collection- and object-specific	varies
Library circulation	Supplemented by local task lighting	300 lux
Offices		500 lux

i. Daylighting:

It has been said that lighting is a main consideration of library design and, while wishing to bring natural light into the building, there are certain disadvantages as regards its changing intensity and position. Continuous exposure to natural light is also damaging to library materials. A design which makes much use of glass, and therefore of natural light, without adequate controls (such as external shading or blinds), may subject users to glare and discomfort caused by heat gain in summer and heat loss in winter. To protect library materials sunlight must be controlled. So, north facing windows are useful. These kinds of windows provide not much direct light. With sort of overhangs, south facing windows can be useful too.

- i. **Side lighting:** The two available side lighting devices are side windows and clerestories.

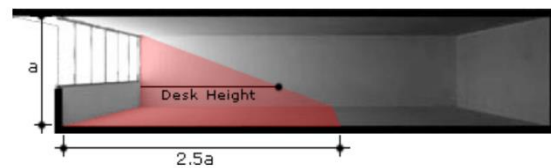


Figure 39: Side lighting

Side Windows: Side windows not only supply daylight but also fulfill the other function of a window, i.e., views and often ventilation. As a result, they are the most widely used type of fenestration. (Nolan Lushington, 2018)

Light shelves may be used to capture some of the excessive daylight in the front of a room and deflect it deeper into the room by means of a highly reflective ceiling. Light shelves may be interior only, exterior only or combined. In addition to its role of balancing the daylight distribution across a room, a light shelf



Figure 40: Natural lighting

may provide shading and cut on excessive glare by obstructing a portion of the sky seen from a certain vantage point inside a room. (Nolan Lushington, 2018) (See fig.45)

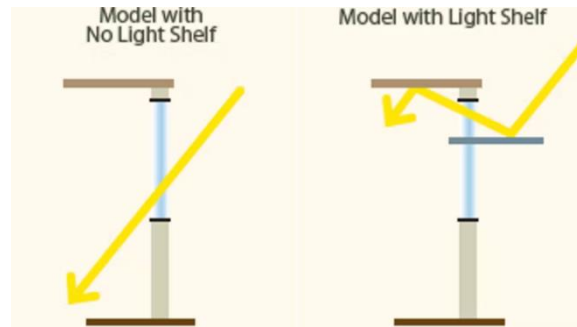


Figure 41: Model with light shelf and no light shelf

Clerestories and Ribbon windows: Ribbon windows are a series of windows set side by side to form a continuous band horizontally across a facade. Clerestories are any fenestrated (windowed) wall of a room that is carried higher than the surrounding roofs to light the interior space. Clerestories may be combined with side windows to provide a more balanced daylight distribution into the stacks area or the reading room of a library. (Nolan Lushington, 2018)



Figure 42: Clearstories

- ii. **Top lighting:** Top daylighting applications harvest daylight from the roof of a building and channel it inside, providing henceforth a better daylight distribution throughout a room. (Nolan Lushington, 2018)

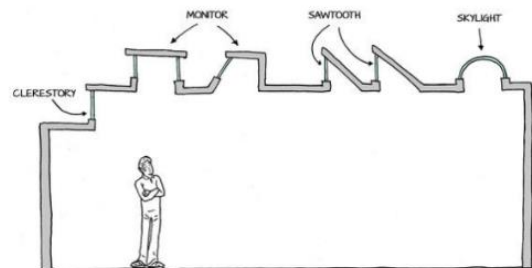


Figure 44: Top lighting types

Skylights: Skylights are the most popular and simplest of the top lighting devices. They consist of apertures within the roof of a building covered with a transparent material. In the event of multiple identical skylights, it is recommended that spacing between skylights should not exceed the interior floor-to-ceiling height of a room for a more even daylight distribution throughout the room. (Nolan Lushington, 2018)

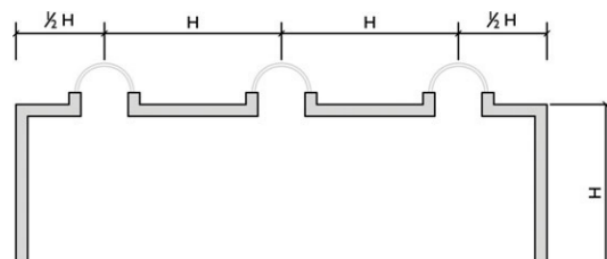


Figure 43: Recommended spacing between skylights for light uniformity, (Nolan Lushington, 2018)

ii. Artificial lighting

Each of the areas requires different types and amounts of lighting. Designing a proper lighting system to supply properly all the activities which take place in public libraries is expensive and complex. Proper lighting in library buildings affects both users and workers. Users will stay longer in library and use the library more frequently. Otherwise, negative effects and impacts such as being less productive among library staff and visiting library less and less will be appearing. (Malman, Lighting for Libraries, 2001)

- a. **Lighting for bookstacks:** Bookstacks must be lit adequately so patrons can find books and also so staff can spend long hours shelving books without visual discomfort. There are a few different approaches to illuminating the book stacks of a library:
 - i. **Parallel scheme:** In parallel scheme a single row of one lamp linear fluorescent fixtures is centered above each aisle. These fixtures can be suspended below the ceiling, recessed in the ceiling, or attached to the stacks. The fixtures must distribute light evenly across the stacks, with adequate light reaching the bottom shelf and no dark areas at the top shelf. Despite these cautions, the parallel scheme makes intuitive sense and has the potential to have the lowest energy use.
 - ii. **Perpendicular scheme:** In perpendicular scheme rows of two-lamp linear fluorescent fixtures run at right angles to the book stacks. There is no need to center lights above the aisles, so this scheme can be coordinated with the ceiling grid. This scheme also works well with compact shelving. In comparison with parallel scheme, this scheme uses fewer fixtures, because of that it may be the lowest cost solution, but because each fixture has two lamps it may not have the lowest energy use.
 - iii. **Indirect scheme:** The indirect scheme uses up lights on top of the stacks or suspended from the ceiling. All of the light is reflected off the ceiling, so the illumination on the stacks is very soft, and the entire range of stacks appears to have a pleasant glow. If the ceiling is white and enough light reaches the bottom shelf, this scheme can work well. The indirect scheme uses higher energy than the parallel or perpendicular schemes.
 - iv. **Hybrid scheme:** The perpendicular and indirect schemes are sometimes combined, with rows of direct-indirect fixtures suspended perpendicular to the stacks. When the ceiling is higher than approx. 10'-0", this hybrid scheme can be a very successful solution that provides good lighting on stacks at moderate cost and with reasonable energy use. (Malman, Lighting for Libraries, 2001)
- b. **Lighting in general reading and staff areas:** Lighting in reading and staff areas must be flexible to present and future tasks. Glare reduction is a primary concern, especially where computers are prevalent.



Figure 45: Parallel scheme

- i. **Direct lighting:** Direct lighting uses down lights to illuminate the reading tables. In down lights compact metal halide lamps or fluorescent and parabolic cones can be used. Also, they can be rectangular or linear fluorescent fixtures with parabolic louvers. The parabolic cones and louvers prevent shallow viewing angles.
 - ii. **Indirect lighting:** Indirect lighting uses fluorescent or metal halide lamps to up light a light color ceiling; the resulting reflected light is inherently very soft, shadow-free, and low-glare. Indirect lighting works well for both paper-based and computer tasks in rooms where the ceiling height is at least 9'-6" and preferably more than 10'-0".
 - iii. **General lighting:** It provides an area with total illumination. People can move easily and safety throughout the spaces by this kind of lighting. It can be accomplished with indoor and outdoor lighting like ceiling mounted fixture, chandeliers, table lamp, track light, wall lighting, spotlight and hanging fixture. Low-level and glare-free ambient lighting offers the best overhead illumination for working on your computer.
 - iv. **Task lighting:** It helps a person carries out specific tasks such as reading, doing homework and playing games. Pendant lighting, down light or directional recessed fixture and desk or portable lamp provide task lighting. Task lighting should be provided in all staff workstations. Movable lamps are best because they allow users to adjust the lighting to their needs.
- c. **Lighting for service desks:** Lighting at service desks must be adequate for paper-based tasks and it must not cause reflected glare in computer screens. In addition, the lighting should be very comfortable because staff members may spend most of their working time at a service desk. If down lights are located above the desk, they should have lenses or diffusers to soften the light that occurs directly over the librarian's or patron's head.



Figure 46: Tama Art University Library, Tokyo, Toyo Ito, 2007. Suspended fixtures with upward-pointing light sources provide an even luminous ceiling plane and a glare free base illumination for the stack and reading space.

iii. Exterior lighting

Parking areas, steps, ramps, paths, plazas, doorways, and potential hiding places should be adequately lit for safety and security. Consideration should be given to exactly what needs to be lit: for example, steps or ramps require light on the walking surface, but pathways, plazas, and parking lots may require light on people's faces to promote recognition, identification, or a sense of security. If a library is located in a residential neighborhood, exterior lighting should limit light trespass onto adjacent residential properties. Exterior lighting should be controlled by timers and photocells so most exterior lighting turns off after the staff leaves and a small amount of security lighting remains on all night.

iv. Lighting controls

Contemporary daylighting solutions often involve sophisticated design strategies, addressing specific lighting and climate conditions. Lighting controls are used or added to improve energy efficiency, reduce glare or natural lighting, provide privacy, or enhance the appearance or comfort of a home. Some of these include:

- i. **Operable window coverings:** Operable window coverings give you the flexibility to choose whether to keep your window coverings open or closed for privacy, and to maximize natural light, take advantage of heat from the sun in the winter, and reduce heat gain in the summer. Options include shades, blinds, screens, awnings, draperies or curtains, and shutters.
- ii. **Plastic films applied directly to glass:** Window films (applied to the glazing surface) help block against solar heat gain and protect against glare and ultraviolet exposure. They are best used in climates with long cooling seasons, because they also block the sun's heat in the winter.
- iii. **Exterior shades:** Shading devices on the external side of the window include shutters, awnings, canopies, blinds, and projecting horizontal and vertical fins.
- iv. **Occupancy Sensors:** Occupancy sensors are a simple way to reduce energy consumption in areas that are not in continuous use, such as storage rooms, electrical closets, mechanical rooms, private offices or meeting rooms. Occupancy sensors are becoming much more ubiquitous in library design as an energy-saving measure.

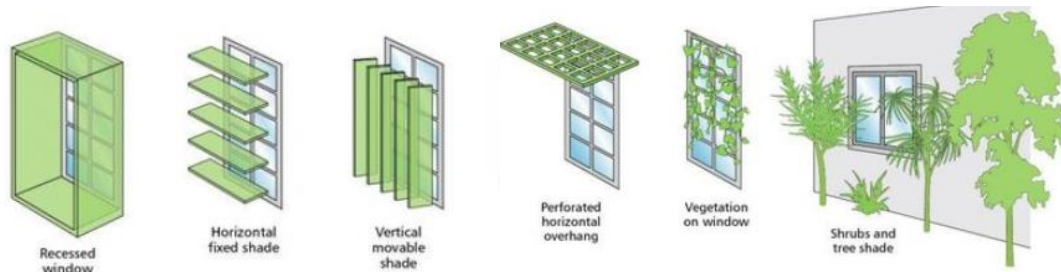


Figure 47: Types of exterior shades

2.1.13.3 Thermal comfort

Most libraries are designed for public access and house primarily modern books and media collections that are not irreplaceable from a historical point of view. Hence, climate control is more concerned with human comfort aspects during hours of operation than maintaining an absolutely stable environment, as required for purely archival purposes. Nevertheless, many libraries are also guardians of rare documents and unique materials that demand a different level of safekeeping with respect to temperature, relative humidity, air quality, and control of light, often requiring the installation of separate systems for collection and non-collection spaces. In other words, climate control always needs to reconcile the requirements of user comfort on the one hand and conservation issues on the other hand. Ideally, the temperature should be closely controlled at 20° to 21° Centigrade (68° to 70° Fahrenheit) and consistently maintained in all areas of a storage facility. This temperature range is regarded as tolerable to staff and users and appropriate for most materials. The ideal RH range for most paper-based library collections is between 30 and 50%, preferably closer to 30% where deterioration occurs more slowly. (Nolan Lushington, 2018)

Library ventilation: Proper ventilation is an important aspect of both reading rooms, where many visitors read, study or use computers, and collection spaces, where paper slowly acquires its aroma; a regular exchange of air is therefore needed.

Ventilation, the dynamic process of airflow within a building, is not only critical for achieving thermal comfort by controlling temperature and humidity levels, but also for assuring acceptable indoor air quality through the dilution of pollutants (grouped in odors and irritants) by both introducing outdoor supply air and exhausting stale air. In libraries, air pollutants are not only a health threat to the occupants but hazardous for rare book collections and archival material as well. Natural forces (e.g., winds and thermal buoyancy force due to indoor and outdoor air density differences) drive outdoor air through purpose-built, building envelope openings, like windows, doors, etc. (Nolan Lushington, 2018)

2.1.13.4 Color

The selection of colors to be used in a library is one of the most interesting and complex aspects of interior design. Like other aspects of interior design, color is affected by the other design elements in a building. A color is affected, for example, by other colors in surrounding areas and by the light that falls on it. Colors viewed under an incandescent light source will appear different from the same colors viewed under a fluorescent light. In selecting colors, therefore, it is important to view them under the same lighting source (artificial or daylight) that will be used in the final building situation. The psychological effect of colors is usually one of the determining factors in selecting them for a library. Generally, blues, greens, and violets are considered cool, restful colors while red, yellows, and oranges are considered warm, active, stimulating colors. Neutral colors are perceived as having less psychological impact and less emotional content. (Brown, 2002)

In public libraries, one color scheme may be used in the adult area while a different color



scheme is used in the children’s area. The two-color schemes may be coordinated by having the same wood color and finish in both areas. Colors may be used in a library to identify particular functions. For example, if a building has several service desks, the desks may all be designed using the same colors and finishes in order to provide library users with a visual cue regarding where to obtain information. In multistory libraries, the use of colors

in the same relative locations and in the same manner on every floor helps to assist users in finding specific areas. In selecting colors for a library, keep in mind that books and other materials housed in the library provide a lot of color. Selecting colors should note that color has an effect on a viewer's perception of objects and spaces. Bright colors make an object look larger, while dark colors make an object look smaller. For example, a small room or space in a library should not be painted a dark color, since that will make the room appear even smaller. (Brown, 2002)

2.1.13.5 Signs and wayfinding

Like hospitals, supermarkets and department stores, libraries rely on signs to help users find their way around. Signs and guiding are part of the library's system of communication with its users and potential users.

Signs and guiding perform three main tasks:

- **to inform** – for example, plans, directories, warning and prohibitive signs and notices showing opening hours, also instructions for the use of equipment or procedures during fire or other emergencies
- **to direct** – that is, arrow signs pointing the way to particular destinations, such as reference library, learning center or local studies department
- **to identify** – indicating when a destination has been reached; for example, fiction, toilets, information desk.



Figure 49: Signage used in Salt Lake City Public Library

2.1.13.6 Presence of nature

The presence of nature, including immersive experiences, such as walking in the woods, to non-immersive, including looking at photographs or houseplants, has been widely studied in relation to restoration of mind and spirit. Studies by Shibata and Suzuki (2002) and Park et al. (2016) have demonstrated that plants in indoor work environments can lower anxiety and improve concentration. Such findings should be taken into consideration when designing library environments.

2.1.14 Hazard Protection

Libraries and archives must have safety and security plans in place to ensure that staff are prepared to respond to fire, water emergencies, and other large-scale threats to collections.

2.1.14.1 Alarms

Fire and burglar alarms should be monitored on a regular schedule and should be connected to a fire or police department or a remote guard or security post manned 24 hours a day. Burglar alarms should be set when the library or rare book department closes and should include both door and motion alarms. Fire alarms should be designed to alert the occupants of the building while at the same time notifying the appropriate emergency services. The most effective fire alarms for libraries are ionization detectors, since they react to combustion gases rather than heat, flame, or visible smoke.

2.1.14.2 Taking precautions against theft

Protecting the collection should include ensuring good security to prevent theft. Cleaning, maintenance, and janitorial staff should always be admitted in the company of a staff member, and unauthorized visitors should never be left alone in storage areas. Controlling exits and entrance: Ideally, all bags and coats should be checked at the entrance to libraries, which should ensure that there are safe areas for storing them. And while it is acceptable for readers to bring laptop computers into a research area, all readers should understand that their computer case must be checked when they leave the area. If possible, libraries should use an electronic detection system at the exit to prevent unauthorized removal of books tagged with magnetized strips. If that is not possible, libraries should have some system for examining the status of books removed for circulation.

2.1.14.3 Pest control

Pests, such as insects and mice can cause enormous damage to library materials. Insects pose a serious threat to collections of all types. The environment that is the most damaging to collections—high humidity, poor air circulation, poor housekeeping—is also the most beneficial to insects. The building interior should be well maintained and kept clean, as free as possible of the dirt and dust that provide nutrients for insects. Water spills should be immediately mopped up, and care must be taken when washing windows and floors that excess water does not permeate the structure through cracks in the walls or floor.

2.1.14.4 Fire control

Library fires are a very common and very serious risk to collections. The sources of fire are electrical wiring, lighting and carelessness. A good detection and alarm system should be installed which should be properly supervised and maintained. Fire extinguisher, water sprinkler system should be installed in each floor. Smoke and fire curtains are a high-performing solution for libraries. These heavy curtains block off certain parts of the room, controlling the direction of smoke and thereby reducing damage and allowing for faster evacuations.

2.1.15 The library as Digital Space

Today's culture has become increasingly dependent on the internet. The role of the public library has surely altered as a result of the growing use of the internet. From the early days of private collections to the introduction of technologies, libraries have always been flexible, early adopters of technology. Digital technology integration is merely a new chapter in the story. A library is a place where individuals can gather with the mutual vision of learning, regardless of the situation. It is a location where people may spend some time alone together and interact with resources that can improve their learning process, whether those resources are written or spoken words, physical or digital, or both.

It is helpful to look back at how traditional library space planning used prior technology before moving forward. Library employees have worked with paper collections for generations, using handwritten records for classification and other tasks. Telephones and typewriters were first used in libraries in the 1900s, but starting in the late 1970s, computer terminals took their place for processing. The introduction of the online public access

catalog (OPAC) in the 1980s brought computers into the communal areas of most libraries. The majority of librarians did not focus on changing the general layout of the area because they placed their initially dedicated OPAC terminals close to the pre-existing card catalog. More equipment was added as the need for terminal use increased, powered by hastily built power poles, cables laid on the floor, and wires strung around the walls. The aesthetics of library spaces were sacrificed as employees converted unwired areas into computer rooms. In many remodeled libraries from that era, computers and printers took the place of visually appealing rows of bound books on wooden shelves, covering once-pleasant structures in a network of cables and surface mounted conduits. (Thomas, 2000)

Libraries have recently networked their catalogs and digitized their collections, greatly expanding the range of resources available to users. They incorporated electronic books and devices to read them on. The supply of automated catalogues is now a global standard. The implementation of an online public access catalogue (OPAC) and a specialized PC terminal has significantly changed how easily the general public can access catalogues. Planning for the library is impacted in two ways: the requirement for additional public space to accommodate the terminals and the cabling infrastructure that goes with them, and the need for less space for the cataloging staff. (Thomas, 2000). More people are interested in using computers as part of their studies or feeling of community as technology becomes more prevalent in today 's society. Large sections of every new library are allocated to the equipment and space requirements for IT supply. It might make up 40–50% of the floor space of a typical public library. (Edwards, 2009)

2.1.16 Radio Frequency Identification (RFID) for library

RFID is a broad term for technologies that use radio waves to automatically identify people or objects. There are various techniques of identification, but the most common is to put a serial number that identifies a person or thing, as well as maybe other information, on a microchip that is attached to an antenna (the chip and the antenna together are called an RFID transponder or an RFID tag). RFID technology can be employed in library circulation operations as well as theft detection systems. RFID-based systems progress beyond security to become tracking systems that combine security with more efficient material tracking throughout the library, including easier and faster charge and discharge, inventorying, and materials handling. (Shahid, 2005)



Figure 50: RFID system in library. Source: Rfid-library

2.2 Workplace

Workplace, a place of employment is a location where someone works for their employer or themselves. Workplaces vary by industry and might be located inside or outside of a building. The advancement of technology, realization of work-life balance, need of mental wellbeing and need of productive workplace environment has resulted in new and different forms of workplace, like coworking place and a virtual workplace, that allows employees to work from anywhere. (What Is Considered a Workplace? indeed.com)

2.2.1 The History of Workplace

Offices were traditionally thought of as little more than a place to work, with no added amenities to promote employee satisfaction or productivity. The workplace has changed significantly over the past 30 years or more. The modern office has changed in a variety of ways to meet changing employee needs and working preferences, from the introduction of new technology and tools to the growing trend of remote working. (History of The Workplace, n.d.)

1. During 1950s

The office technology during the 1950s was telephone and typewriter. Basically, the following type of office layout was adopted:

TAYLORIST OFFICE LAYOUT

Office layouts were inspired by the factory or production line, with rows of desks crammed tightly together. By design, the Taylorist office aspired to significantly increase productivity. To make sure everyone was working hard and to make employee supervision simple, managers and executives still benefited from private offices with windows.



Figure 51: Taylorist office layout

THE OFFICE LANDSCAPES

Due to the impact of Burolandschaft, a German workplace design aesthetic, office layouts saw a modest change in the 1950s. With a more flexible design and layout, the design style placed a lot more emphasis on satisfying the demands of the workers than it did on prior office layouts.



Figure 52: Open-plan workplace

The workplace then evolved into a much more social setting, promoting teamwork. This marked the beginning of what is now known as the open-plan workplace and is frequently related to the concept of contemporary office design.

2. During 1960s:

The office technology during the 1960s were manual processors, RAM chip, handheld calculators. Office tech began to change, with early computers becoming smaller and more user-friendly.

ACTION OFFICE

The 1960s saw the beginning of the Action Office. This concept worked with the capacity of employees to personalize their area and included a range of work settings for staff, better mobility, and greater privacy. This workplace layout had an impact because it gave employees the freedom and flexibility to choose a position that was appropriate for the task at hand. This later changed into the 1980s cubicle.



Figure 53: The action office

3. During 1970s

Throughout the 1970s, the cubicle idea predominated. However, open-plan offices with lines of workers standing in rows could still be seen. In this decade, the first ergonomic office chair was developed with the user's physical health and comfort in mind. Additionally, offices were structured more to provide employees the opportunity to be creative and work independently. The office technology during the 1960s were fax machines, laser printer, Floppy disk, Local network (ethernet).

4. During 1980s

The office technology during the 1960s were Microsoft windows, The World Wide Web, Car phones.

CUBICLE FARM

1980s saw a shift in the emphasis of office design away from healthy working conditions and toward increased productivity and profitability. Cubicles were simple and efficient, and they were thought to help workers concentrate better.



Figure 54: Cubicle workplace

CORPORATE CULTURE

In the 1980s, corporate culture began to take center stage in the workplace. Employees started discussing the idea of work-life balance as more people entered offices wearing power suits. Wellness initiatives became ingrained in workplace culture, and it was crucial that every employee was aware of them. The workplace began to adopt computers in the 1980s, which signaled the dawn of a new technology era that would forever alter the office.

5. During 1990s

The office technology during the 1960s were Email, mobile phones, USB, Portable computers.

THE FUNCTIONAL OFFICE

Office design in the 1990s was more utilitarian and functional, in contrast to the 80s. While computers were transforming the way people worked, office design remained dull. With most offices colored beige, brown, or grey. Cubicles also had to become smaller as the number of employees rose, along with the cost of office space. In the early 1990s, improvements in connectivity and the creation of the internet meant a computer went from being a luxury item to an essential item for almost every employee.

6. During 2000s

By the turn of the 2000, whatever appeal the cubicle had in the 1960s had vanished. Open-plan offices became more popular in the early 2000s, and more people started working from home. In terms of how people worked, the 2000s saw both progress and revolution. High-speed internet and technology are now pervasive in society. In the later part of the 2000s, the smartphone was made widely available, revolutionizing how people connected with one another.

The word "**coworking**" was created in the 2000s. As coworking spaces gained popularity, more employees started working outside of the office. People began to work in interesting ways, such as from home or at coffee shops.

7. During 2010s

The workforce grew considerably more mobile as technology developed, and they started to demand flexibility in their working hours, schedules, and locations. People began working from a variety of locations, including cafes, coffee shops, and their houses, as they were no longer confined to a desk.

Workplace design started to accommodate hot-desking and flexible desk arrangements as the desire for remote work became the new standard.

“COOL” OFFICES

Employee expectations increased dramatically in the 2010s, and there was a significant change in how people interacted with their work environments as well as how they worked. The idea of the "breakout area" came to life when highly designed, colorful, and energetic workplaces with a variety of various workspaces emerged. A location where people wished to spend time and develop closer ties to their company's brand and workplace culture. Technology got more seamlessly woven into the environment, becoming ever-present.



Figure 55: "Cool" office

8. During 2020s

More businesses are embracing designs that create a palette of place because various generations tend to have varied expectations from their workplace. A diversified workforce benefits from various spaces. For instance, older workers might like the regularity of a designated desk, but younger workers might prefer the freedom to work wherever they

want. By including a range of spaces around the office, everyone has the ability to work in the environment that's best for them.

2.3 Co-working

Shared office spaces, also known as coworking spaces, are offices which are shared by different businesses and individuals, from startups to freelancers. There are a number of different options when it comes to shared office spaces, from a shared workbench to renting a private office - both of which can be hugely beneficial to businesses. Coworking spaces have grown in popularity over recent years and it's not difficult to see why. Not only do they provide a hugely collaborative space for any kind of business, but they're also sociable and affordable, making them perfect for freelancers. Freelancers, business owners, and other self-employed creatives are constantly searching for a work setting outside of their homes that offers them some stability, clarity, and extra motivation at a time when digital distractions are always around, due to which there is growing popularity of coworking spaces. (Why are Shared Office Spaces so Popular?, 2020)

The term, simply put, refers to people working together. An individual who works in the same workplace and in the same profession is referred to as a "coworker" in the traditional sense. But as the job market changes, more and more people are finding ways to supplement their incomes by working from home, working as independent contractors, or starting their own small businesses. Therefore, a coworking space offers a shared office where anyone may gather and complete their work, regardless of their industry, age, or experience. A coworking space is designed to provide you with everything you need (Think workstations, a copy machine, WIFI, coffee, etc.) to have a productive work day, without the distractions of home or a coffee shop, and without the cost of owning your own office. (Ashley, 2018)

Coworking spaces are shared offices that are used by a variety of knowledge workers, primarily freelancers, who operate in the broad field of the knowledge economy. Practically conceived as office-renting facilities where workers rent a desk and a wi-fi connection, these are, more importantly, locations where independent professionals live their daily routines side-by-side with professional peers, generally working in the same sector. It opened up the possibility of envisioning a "third way" of working, which would be in between a "standard" work life in a traditional, clearly defined workplace in a social setting and an independent work life as a freelancer, which would be characterized by freedom and independence. (Gandini, 2015)

2.3.1 The History of Coworking From 90s To Present

A freelancer or startup had few options for workplace for a very long time. When beginning a business or working for themselves, the majority of people had little choice but to work from home or in a coffee shop, which could be isolating, distracting, and unproductive. Coworking spaces became popular somewhere in the early 2000s, providing the freelancing community with a much-needed remedy. (Grinberg, 2019)

2.3.1.1 Important Years in the History of Coworking

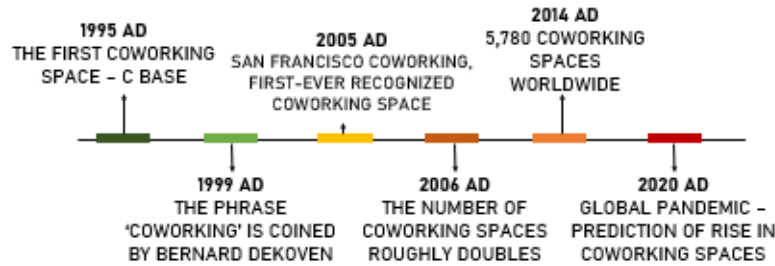


Figure 56: Timeline showing important years of coworking

(What is coworking? Everything you need to know about coworking., n.d.)

1995 – The first coworking space – C Base – was founded by hackers in Berlin and was called “Hackerspace”. The idea was to share both space and knowledge in order to work on coding projects together. After that, some hackerspaces started adding seminars and social events, which made it more mainstream and lead to the opening of more coworking spaces. At the end of 1995, there were “Hackerspaces” in San Francisco, Santa Clara and Brooklyn, and the trend kept growing.

1999 – The phrase ‘coworking’ is coined by Bernard DeKoven. However, the term refers to something different than today’s concept of coworking. DeKoven, a game designer, uses ‘coworking’ to refer to the way we work, not the space that we work in. His goal is to advance working practices that value teamwork, the demise of hierarchy, and treating coworkers equally.

2002 — Saw the establishment of the Schraubenfabrik, an "entrepreneurial center" by two Austrian businessmen in a former factory in Vienna. The area is intended for entrepreneurs, providing them with a location where they can cooperate and work with like-minded individuals in order to avoid having to do so from their homes. Architects, PR experts, startups, and independent contractors were there. Even though it wasn't labeled a "coworking space," this location is unquestionably the origin of coworking as we know it today.

2005 — On August 9th, Brad Neuberg establishes San Francisco Coworking Space, the first-ever recognized coworking space, within a feminist collective called Spiral Muse in San Francisco's Mission neighborhood. While offering the structure and community of working with others, the area is meant to preserve the independence of working independently. For the first month, no one turns up. After more outreach from Neuberg, an athlete and startup developer named Ray Baxter arrives, becoming the spaces first member and in turn the world’s first official coworker.

2006 — Beginning in 2006, the number of coworking spaces and members roughly doubles annually over the following seven years. The coworking revolution will soon be the name given to this exponential rise. The first "coworking place" that was open full-time was The Hat Factory, which debuted in 2006.

2007 — Coworking made its first appearance as a trend in Google's database in 2007. Since then, the number of search inquiries has increased 20 times, peaking in the early months of 2019.

2008 — Coworking visas, which allow members of certain coworking spaces free access to other coworking spaces also covered by the agreement, are introduced in 2008. This expands the global coworking community and enables mobile workers to access coworking spaces anywhere in the world without incurring additional costs. The fundamental concepts of coworking and collaborative working are being explored and are gaining traction all around the world.

2009 — "I'm Outta Here! The article "How Coworking is Disrupting the Office" gets published. This is the first book on coworking, and it traces the history of the individuals and locations involved in the movement, as well as how coworking is altering how we think about the typical office. As one of the first official "coworking spaces" to launch in Germany, Betahaus introduces coworking to the country's mainstream media.

2010 — On July 10th, Deskmag, the first online publication on coworking, launches. The publication, which has its headquarters in Berlin, writes articles about the history, purpose, and aesthetics of coworking spaces.

2011 — The first major corporations and businesses start experimenting with their own coworking spaces in 2011. In its current form, WeWork welcomes business owners in New York City.

2012 — On June 16th, Japan hosts its first-ever coworking conference. Only five coworking spaces existed in Japan two years ago, but there are now more than 70. This indicates that coworking is becoming more popular in Asia. There are more than 2000 coworking spaces globally.

2014 – 5,780 coworking spaces worldwide with 295,000 members

2016 – The combination of coworking and coliving continued to develop, and WeWork launched coliving in New York. They were micro-apartments with one or two bedrooms. They were furnished and ready. Each coliving unit also had a community manager that solved practical questions or planned events.

2020 – The global pandemic had a significant impact on the sector, and there has been discussion over whether offices will still be necessary in the future. There is uncertainty about the future of the office sector, as many industry insiders predict that coworking spaces will replace larger offices as the new trend.

2.3.2 The Rise of Coworking Spaces

Coworking spaces provide small businesses, independent contractors and other workers a space to get work done, network and participate in their local business community. What was relatively an unknown concept 10 years ago, coworking spaces have transformed the

way the modern worker interacts with the business world. Currently, there are about 17,000 coworking spaces across the world, which means understanding the benefits that come along with using them is essential to planning a business's success. (Peek, 2019)

The relation between the working environment and productivity is undeniably significant. As more and more organizations realized the direct relationship between cooperation, performance, and innovation, decision makers proactively started changing their workplaces to enhance creativity, teamwork, and productivity. The concept of open workspaces appealed to the decision-makers, and organizations began switching to open floor layouts about ten years ago. Designing an office environment with an ergonomics focus and trendy break rooms and cafés has become essential. The major companies with cutting-edge workspaces, Google and Facebook, have experimented heavily in their home nations to create the greatest working conditions for their staff, and they have become a source of inspiration for many others to try out innovative workspaces.

Coworking emerged as a more effective and economical approach, advancing open work culture innovation one step further. With flexibility in terms the quantity of space, the number of seats, etc., these shared spaces offer services like workstations, private cabins, high-speed Wi-Fi, conference rooms, a café, and leisure zones. Working professionals who prefer to avoid paying costly rent and signing lengthy office leases may choose coworking spaces. (Arora, 2017)

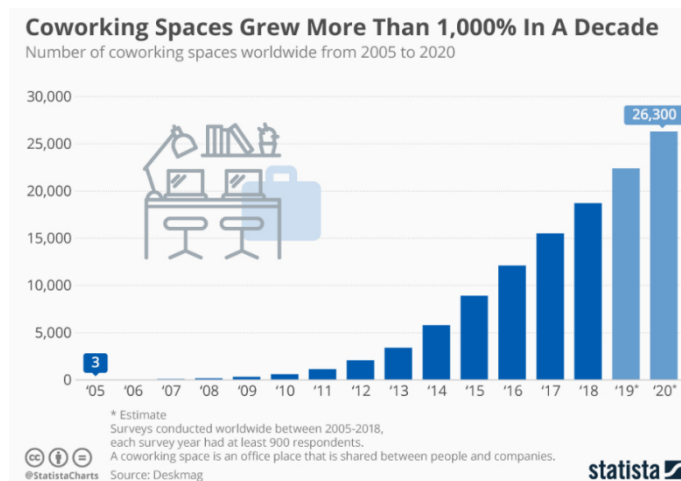


Figure 57: Graph showing increase in coworking spaces

The increasing demand for coworking space can be linked to three behavioral aspects:

- i. **Collaboration:** the requirement for increased collaborative work in multidimensional sectors.
- ii. **Knowledge creation:** The goal is to develop interaction dynamics among entrepreneurs, freelancers, and startups in individual and local communities. Because of their emphasis on professional contacts among the actors who use these environments, coworking spaces are increasingly being seen as attractive physical places for knowledge generation.

- iii. **Affordability:** Coworking spaces provide an affordable alternative to renting office space. (Chakraborty, 2019)

2.3.3 Benefits of Coworking Spaces

Coworking spaces can be a community space where people of varying business ideas can gather together and learn from one another, whether it's for networking with other business professionals or working together on individual projects.



Figure 58: Benefits of coworking spaces

- i. Strong network

The chance to interact with other people is one of the main advantages of a coworking space. If you operate from home or another independent location, you may be depriving your company of the crucial connections it needs to grow. Sometimes all a small business needs are the spark that being close to other prosperous business owners may provide. (Peek, 2019)

One of the many reasons shared office spaces have become so popular is because many coworking spaces profit from regular networking events that give people the chance to get to know the other people in their shared office space. Networking events offer the perfect environment for creating professional connections that can help your business flourish, whether you're a startup wanting to hire a new employee or you just need assistance with your newest project. (Why are Shared Office Spaces so Popular?, 2020)

- ii. Flexible schedule

Whether you produce your best work at night or in the morning, coworking spaces give workers the freedom to determine their own work hours, with many of them providing members with 24/7 access. Coworking spaces are popular because of their flexibility, particularly for freelancers or individuals who run a business in addition to a 9 to 5 employment. (Why are Shared Office Spaces so Popular?, 2020)

- iii. Lower cost

Shared office spaces offer a number of various membership choices for any type of business, from small firms that need a private office to freelancers who only want to hot desk a few days a week, and are far less expensive to rent than traditional offices. Additionally, many people can actually save money when working in a shared office because many coworking spaces offer free tea, coffee, and biscuits in addition to meeting rooms and event spaces included in the leasing price. (Why are Shared Office Spaces so Popular?, 2020)

iv. Work where you want

One of the main complaints of freelancers is that they frequently experience loneliness and inefficiency while working from home. The alternative of working from coffee shops, though, might be costly and equally ineffective.

Coworking spaces give freelancers a place from where they can plug in their laptops, focus, and finish their work. Additionally, the majority of coworking spaces offer meeting rooms for rent to both members and non-members, giving independent contractors the perfect location for client calls and meetings. Whether they choose to hot desk at a coworking space, or rent their own dedicated desk, coworking spaces provide freelancers with everything they need to get their work done and their clients happy.

v. Inspiring coworkers

Coworking environments can inspire creative bursts by allowing you to collaborate with others and expose yourself to fresh viewpoints. Sometimes moving to a new office might give you a mental boost and inspire you to come up with new solutions for work-related issues. (Peek, 2019) Coworking facilities draw a wide variety of people, from independent contractors to small enterprises, so there is always someone with whom to exchange ideas. Freelancers frequently discuss how lonely their work may be, particularly if they work from home. However, shared office spaces may be incredibly collaborative, giving people the ideal environment to form relationships, make friends, and sense of belonging in a group. (Why are Shared Office Spaces so Popular?, 2020)

2.3.4 Elements of Good Coworking Spaces

A wide range of users demand workspaces that complement their individual aesthetics. Marketing to numerous industries is necessary to draw in members or occasional users. Flexibility is a major benefit of coworking spaces. Contrary to traditional office settings with 1-to-1 desk ratio, coworking organizations favor flexible, cutting-edge layouts.



Figure 59: Elements of good coworking spaces

i. Flexibility

A wide range of needs must be satisfied by coworking spaces. Some people might like quiet, private workstations, while others might do best in a bustling setting that encourages collaboration. For flexibility, we can start with retractable partitions, stackable chairs, and tables with wheels. Electrical outlet should also be placed often in flexible spaces, whether they are on the floor, hanging from the ceiling, or on the walls. The creation of this open area might also increase productivity among employees because the absence of walls leads to an open mind where creativity can grow and thrive.

Flexible seating options are one of the best coworking space design concepts. Some people are not most productive at a desk or in an office chair. People may perform at their best in one location one day and in another the next. When designing a coworking space, it is important to have a range of adjustable seating options so that employees may choose the ideal setting for their requirements, whether they are working alone or with others.



Figure 60: Flexible spaces in coworking space

ii. Going green

Using green plants has been shown to lessen stress. In addition to purifying the air, plants enhance the aesthetics and tranquility of a coworking office environment. They promote a friendly atmosphere where imagination and creativity are allowed to flourish. By fostering a natural atmosphere that helps to relax our subconscious, plants can increase productivity.



Figure 61: Use of green plants in the interior

iii. Lighting

Studies have shown that natural light, especially a lot of it, can greatly improve mood and increase productivity. Adequate lighting is one of the most crucial elements of any workplace. A distinctive lamp or fixture can make the difference between a dim, gloomy setting and one that is exciting and motivating.

There must be artificial lighting in every working space, but when it is appropriate, ample natural light should be allowed to flow in. One way to make people happier to return to your coworking space day after day and feel like they are getting more done is by opening the windows and allowing more natural light into the space. Natural light has a way of positively impacting our mood, so we feel better about our work. More natural light isn't always preferable, though, as excessive amounts of direct sunshine might strain employees' eyes or make it difficult for them to see their computer screens. Employees can choose the ideal angles in relation to their nearby light sources when you give them freedom to arrange their office furnishings as they see fit. According to the functional requirements, a range of lighting is required, including warm ambient light, task lighting, and large windows for natural light to meet the functional requirements of the space.

iv. Intentional flow

Additionally, coworking spaces owe their coworkers simple, intuitive wayfinding. In other words, it should be simple for coworkers to travel from one zone to another, from private to shared space, with the least amount of disruption and inconvenience.

Coworking spaces can take advantage of occasions to pause the "flow" of a space. Similar to a rest area on a highway, flow interruptions don't affect traffic generally but provide colleagues a chance to "pull over" and have productive interactions with potential partners.

v. Create a neighborhood feel with different areas

Try not to make just one big open space. You want people to feel like they're in neighborhoods. Create areas with library rules and others where people can be noisier; create designated break areas; create designated kitchen areas. These things all add variety and work options for members. People are in a coworking center because they want vibrancy and connection, so avoid designing a space with long, dark hallways.

2.3.5 Various Spaces in Coworking

Coworking spaces must meet a wide variety of needs. A high-quality coworking space will allow everyone to work in a way that makes them comfortable, whether they are introverts or extroverts. Some people may desire quiet, independent workspaces, and others may thrive in a busy environment teeming with collaboration. By including a variety of different spaces, users can constantly retain that nomadic feeling or simply hone in on their perfect work environment. (Clifton, n.d.)

To accommodate a range of users' needs, some of the spaces provided are:

i. **Open-air benching or hot desking**
Modern work areas are best expressed by open-air benching. There are no special considerations or designated seating. It's just a table and chair that are empty and waiting to be used. Despite its utilitarian appearance, open-air benching is all that most people require for work. (Clifton, n.d.)

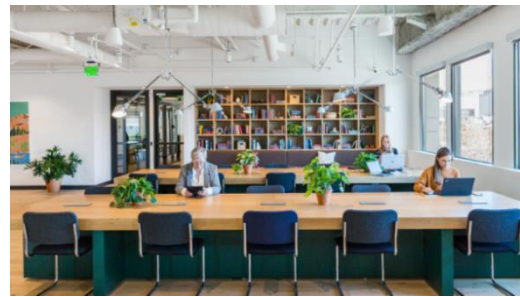


Figure 62: Hot desking

ii. **Pods and neighborhood**
Pods are a more consolidated form of benching. In true shared space design, these workspaces limit the number of people—usually between three and six—to create a sense of closeness. Small groups foster networking and collaboration, and they're great for social workers. (Clifton, n.d.)



Figure 63: Pods and neighborhood

iii. **Private workspaces**

It is important to remember that some people prefer to work solo and are not as open to communication with others. If you have space, allow the option of private offices for those folks who do confidential work or are just not thrilled about sitting close to and socializing with others. So, it is important to make some individual private workstations available as people need privacy for phone calls, webinars, one-on-one meetings, and other sensitive work. (Clifton, n.d.)

iv. **Collaborative spaces**

Because they want to feel like they are a part of a community while also escaping the solitude frequently encountered at home, more people than ever are relocating to

coworking spaces. This may be a space where you offer coffee and snacks, or a room with cozy couches and chairs where people can eat their lunches and take breaks while conversing with one another. (Clifton, n.d.)

v. Breakout spaces

Taking breaks is important during the workday because it gives people the chance to step away and refresh their brains. By providing a nice breakout space away from the stress and noise of the main office, employees are able to reflect on tasks and think clearly. An awesome view, lunch-time yoga classes, a café, a ping pong table, and social events are all highly appealing and can elevate a coworking space to sound like a dream. (Clifton, n.d.)

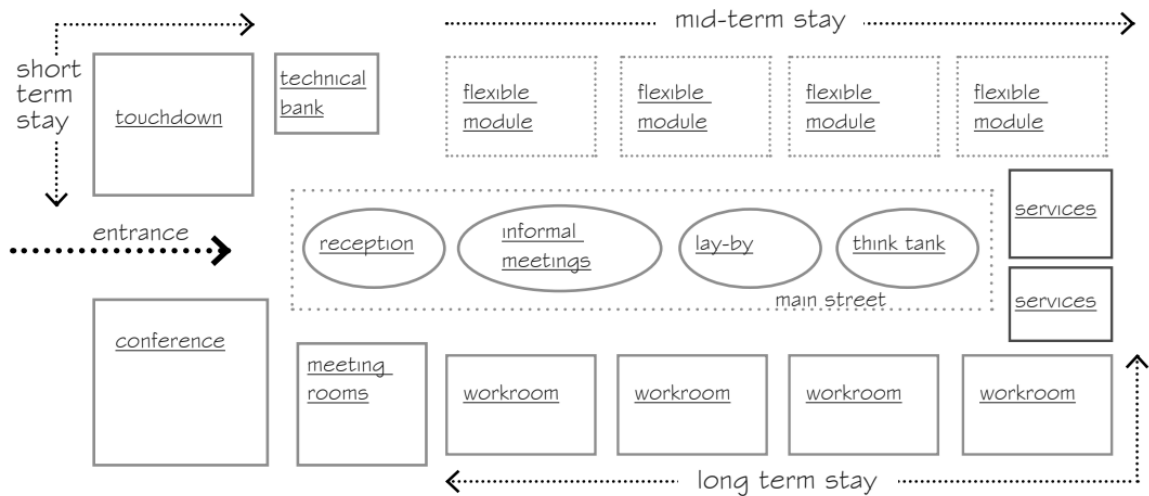


Figure 64: General plan layout of coworking space.
Source: How to create a coworking space handbook

2.3.6 Workspace Design Principles

The 5 key parameters for creating a successful space for interaction in a workspace area are given below:

2.3.6.1 Proximity

According to oxford dictionary, proximity is a state of being near to somebody in distance or time. Being in close physical proximity to others with skills and knowledge to share is also beneficial to users (Boud & Middleton, 2003; Bunnell & Coe, 2001). Given that a large part of the appeal of co-working is socialization and sharing ideas with other members, workspaces should also take note of the power of physical proximity.

Locations on the same floor or with a single story are preferable over those with numerous storeys since vertical separation has a more negative impact on teamwork and communication. (Lim)

2.3.6.2 Privacy

Privacy is a sense of perceived visual and aural privacy. As co-working space accommodates coworkers with different personality types; openness and interaction are not for everyone. In the paradox of co-working office open plan environment that allow more interaction but simultaneously cause more distraction through noise and interruption (Broadbent, 1958). Thus, the challenge lies in designer's hand to establish an office design that not only welcome occupants with different personalities by established spaces that displace, reduce, avoid distraction but also contain various interactions and collaborations. (Lim)

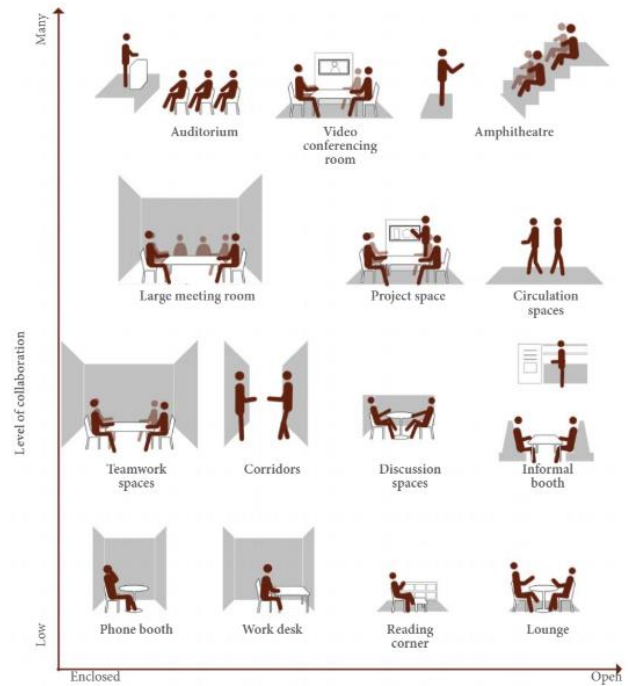


Figure 65: Spaces based on openness.
Source: (Lim)

2.3.6.3 Functionality

Workplace functionality refers to the suitability of the area, which is influenced by the arrangement and design of the furniture, the tools and services offered, the surrounding conditions, and the space's capacity. (Lim)

2.3.6.4 Legitimacy

Legitimacy argues that a good reason must be given for occupying the area. Workers must have a legitimate purpose for entering the area where activities are taking place. To put it another way, a variety of locations should be made available to employees to support their activities, foster their relationships with coworkers, and assist them in achieving their individual goals. (Lim)



Figure 66: Purposeful setting in workplace.
Source: (Lim)

2.3.6.5 Accessibility

Accessibility refers to the simplicity of entry and the visibility of social areas. Unplanned meeting places should be conveniently situated with good visibility and be simple to get to. (Lim)

2.4 Sustainable Design Approach

Sustainability, defined by the World Commission on Environment and Development as development that satisfies current needs without jeopardizing the ability of future generations to satiate their own needs. When this intricate idea is applied to architecture, it then refers to planning for healthy living spaces while attempting to reduce adverse effects on the environment, energy use, and use of human resources.

A building's materials, construction techniques, resource usage, and overall design all exhibit sustainable architecture. Although it must be both aesthetically pleasing and functional, the space must be built with the goal of achieving long-term energy and resource efficiency. (Merril, 2012)

2.4.1 Passive Noise Control

Designing the building and the spaces within it to benefit from noise control or mitigation. The impact of noise can be reduced through building layout and other design elements. This is known as passive noise control. Consideration to all potential sources of noise from both outside and inside and consideration to all potential sound paths – including direct paths (for example, through doors and windows) and indirect paths (for example, when sound is deflected off walls, or passes through minor gaps in walls, or passes around obstructions such as fences) is necessary while designing.

Controlling noise

Key strategies include:

a) Controlling Noise at Source

Increasing distance from the noise source; closing potential sound paths (such as openings in walls facing sources of noise); and using mass, insulation or buffering to block the noise. Adding Sound Control Features to a building retrospectively can be expensive, so where possible, aim to control sound at its source.

b) Where noise cannot be controlled at source:

- Increase the distance between the noise and the location where it will be heard – for example, locate the building as far as possible from a noisy street frontage
- Use zones to control noise, by grouping noisy or quiet activity spaces together
- Don't locate windows or doors towards sources of noise
- Provide a buffer space or spaces between quiet and noisy spaces

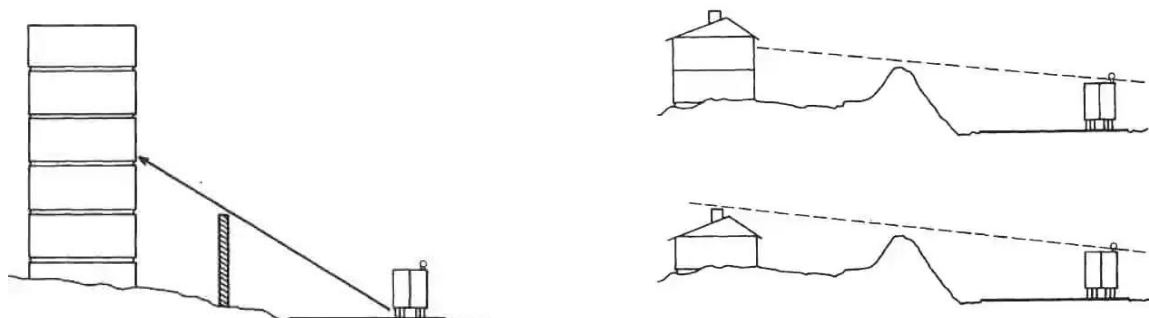


Figure 67: Use of Solid Walls in Buildings for Noise Control.
Source: (K, 2009-2021)

Noise control should be considered alongside other factors such as orientation for passive heating and cooling, views, privacy, and ventilation. Compromises may be necessary, for example if opening windows are needed for ventilation or solar access on a wall facing a source or noise. (Branz, n.d.)

Noise in the building can be control by following methods:

- Room arrangement
- Use of solid walls
- Having courtyards (K, 2009-2021)

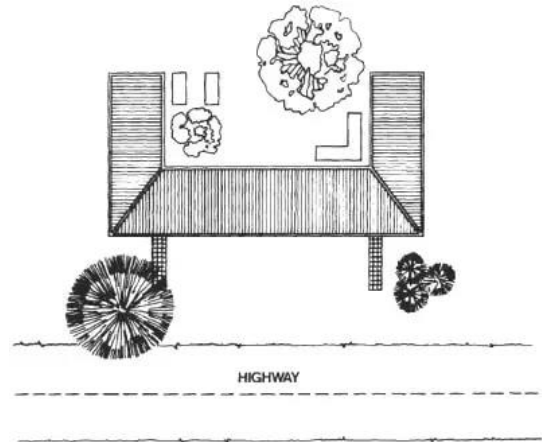


Figure 68: Courtyards for Noise Control in Buildings. Source: (K, 2009-2021)

2.4.2 Orientation

Orientation is simply what compass direction the building faces. Along with massing, orientation can be the most important step in providing a building with passive thermal and visual comfort. Orientation should be decided together with massing early in the design process, as neither can be truly optimized without the other. (Venturewell, n.d.)

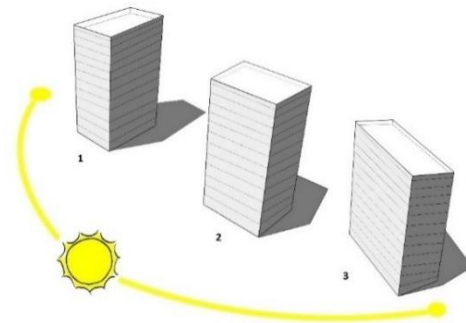


Figure 69: Orientation 1 is worst for daylighting, 3 is good, and 2 is best. Source: (VENTUREWELL, n.d.)

2.4.3 Green roof

A vegetative layer cultivated on a rooftop is known as a "green roof" or "rooftop garden." Green roofs offer shade, absorb heat from the atmosphere, and lower air and roof surface temperatures. In urban areas or other constructed environments with little natural vegetation, using green roofs might reduce the heat island effect, especially during the day. Green roof temperatures can be 30–40°F lower than those of conventional roofs and can reduce city-wide ambient temperatures by up to 5°F. In addition, green roofs can reduce building energy use by 0.7% compared to conventional roofs.

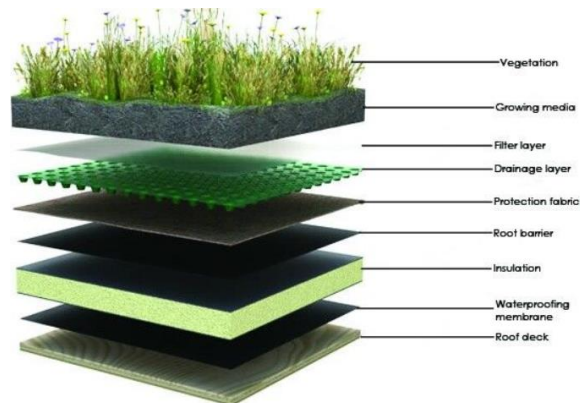


Figure 70: Components of green roof. Source: Pinterest

2.5 Technical Aspect

Various technical aspects need to be considered while designing which helps in better functioning and effective planning of the library. Some of the factors to be considered are:

2.5.1 General Library building organization

All libraries have the following types of areas:

- i. **Non-public areas** include the staff workroom, the book drop room, staff lounge and restrooms, receiving/delivery area, and storage areas for staff. Non-public areas provide staff workspace and space for staff breaks.
- ii. **Public areas** include the lobby, restrooms, meeting rooms, service desks, collection shelving and reading areas, quiet study room and group study room(s), and public computer workstations.
- iii. **Support areas** include mechanical and electrical equipment spaces, janitorial closets, and information technology (IT) equipment closets. (Architects, 2017)

2.5.2 Before- /After-Hours Access

The library should be designed to accommodate before-/after-hours (i.e., time periods that fall outside the library's normal open hours) access to select areas of the facility. (See fig.77) (Architects, 2017)

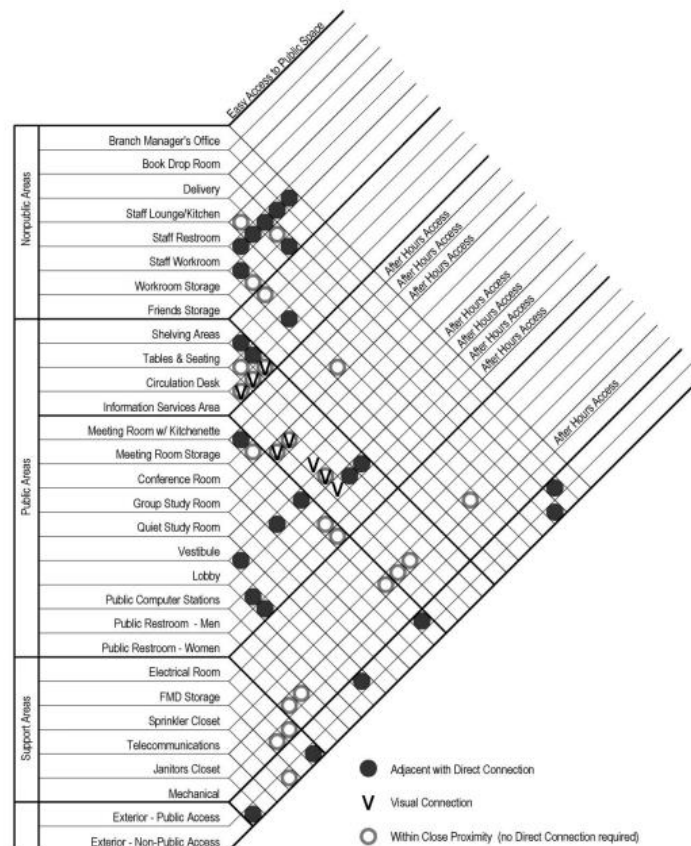


Figure 71: Adjacency matrix. Source: (Architects, 2017)

2.5.3 Parking

Parking must be offered in accordance with the regulations. There must be accessible off-street parking spots, as well as relevant access aisles and accessible paths. The total amount of parking spaces required shall include the number of accessible parking spots. Staff parking shall also be included depending on the staffing requirements for the library. Vehicle traffic must be planned to avoid interfering with pedestrian routes as much as possible. (Architects, 2017)

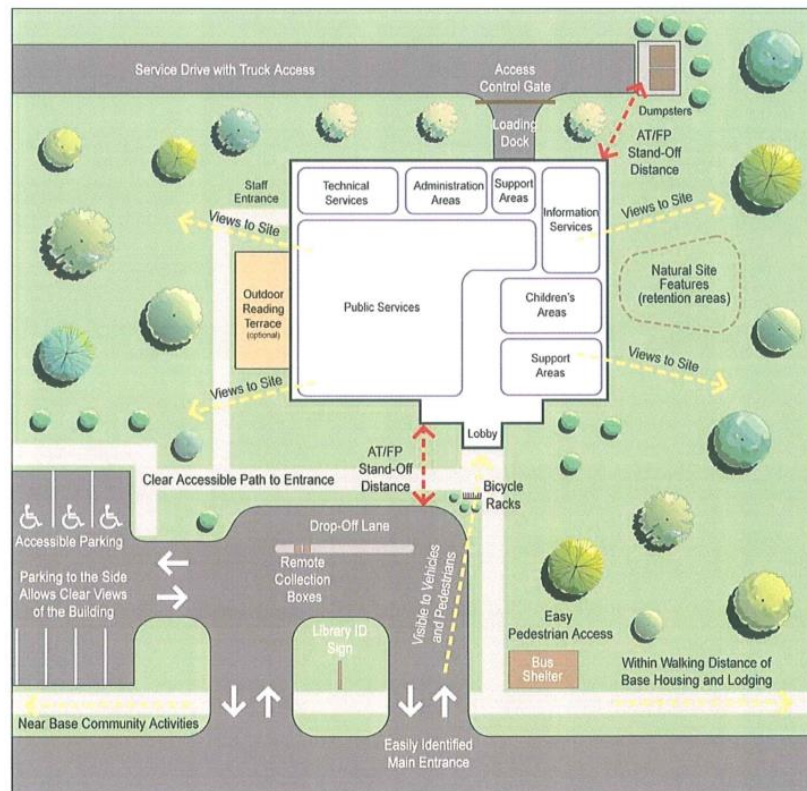


Figure 72: General layout of library building.

2.5.4 Book drop-off zone

To allow for the usage of the external book drop and customer drop-off without interfering with through traffic, provide a car pull-in or pull-up area close to the main entrance. The passenger loading and unloading zone sign must be shown in the vehicle pull-in or pull-up zone, and it must also be ADA accessible. (Architects, 2017)

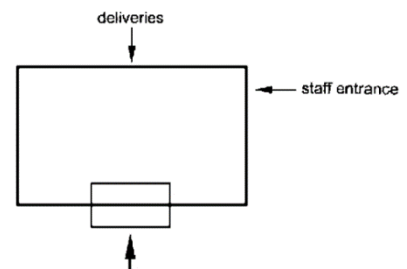


Figure 73: Conceptual diagram of entrances. Sources: (Edwards, 2009)

2.5.5 Loading/deliveries

Wheeled bins are used to transfer library materials. For the daily delivery and pickup of library goods, create an access route and space with enough mobility for a 26-foot truck.

The building's delivery entry must be placed as far away from the main entrance as is feasible. (See fig.80)

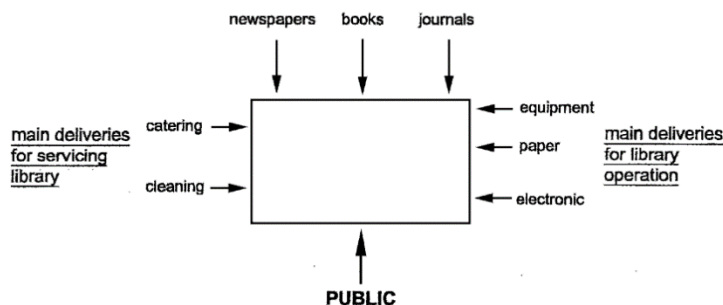


Figure 74: Main deliveries for library stock.
Source: (Edwards, 2009)

2.6 Inferences From Literature Review

The major objective of the literature review was to better understand the functioning of library and coworking spaces and the ways they can be connected. The requirements, themes, discussions, issues, challenges, and strategies to design a public library was understood. The following inferences were taken from the study:

S.NO.	ASPECTS	LITERATURE REVIEW
1.	Access and community linkage	Must be open and accessible to the whole community by designing a building that promotes equity for people who are young and old, and people with disabilities. Providing spaces like “living room” with comfortable seating and a range of activities, creating spaces which are inviting
2.	Flexibility	Use of flexible space dividers, furniture which can be easily moved and stored, privacy screens, variety of loose seating options, provision of varied learning environment
3.	Interactive	People choose social spaces (like library’s café) where they can meet other users. Create spaces which promotes contact between users.
4.	Lighting	Use of both natural as well as artificial light is necessary. Side windows along with skylights or clearstory windows provide balanced daylight. Artificial lighting with adjustable lighting is better.
5.	Acoustics	Acoustical treatment shall be considered to cater those who prefer silent reading. Acoustic panels, partitions as well as proper space planning can be done.
6.	Colors	Very bright colors should be avoided. Neutral colors which are calming is preferred. Colors can be used to define, separate and identify various spaces.

2.6.1 Linkage between library and coworking spaces

Combining library and coworking spaces can be an excellent method to create a distinctive and dynamic setting in which people can work, study, and collaborate. Creating a shared physical area where both activities can take place is one of the simplest methods to merge library and coworking spaces. This can involve providing desks and other workstations within the library or creating a separate coworking area within the library.

Libraries are well-known for having large collections of books, journals, and other materials. Individuals can gain access to these resources as well as the place to work and collaborate with others by combining a coworking space and a library. Similarly, coworking spaces offer a collaborative environment in which people may network and make relationships. Coworking spaces often host events and workshops. By partnering with a coworking space, libraries can offer new programming and events to their patron and make better use of their space and generate additional revenue. These places can be linked at some common areas they share, such as printing and scanning and break out areas. Breakout rooms with play areas and coffee can be a great addition to a library, as they provide additional options for patrons to work or relax in a comfortable and welcoming environment. A well-designed breakout room with comfortable seating, play areas, and coffee can help patrons feel more focused and energized. This can lead to increased productivity and better outcomes for projects or studying.

Overall, combining library and coworking spaces can offer a unique and valuable workspace that provides access to resources, fosters community building, is cost-effective, flexible, and can increase productivity.

3. CASE STUDIES

The case studies chosen for discussion were particularly chosen due to their significance to the key aspects outlined in the earlier parts. The studies have been considered significant because they provide suitable representations of architectural responses to new trends in public libraries and coworking spaces. The case studies done are: Kathmandu university central library, Tribhuvan university central library, work around, The locHal and Seattle central library. These selected case studies all have their strengths and weaknesses which I can learn from in the aspect of designing a new library including coworking spaces.

3.1 KATHMANDU UNIVERSITY CENTRAL LIBRARY (KUCL)

Kathmandu University Central Library is situated in one of the beautiful hills of Dhulikhel, Kavre, 28 km from Kathmandu surrounded by greenery and magnificent view of the Himalayas in the north, in a pollution free environment. It is centrally located within the campus and is accessible within a reach of five minutes from each and every department. It is of three storey building having 10,000 sq ft area in each storey. This library was selected to study about the kinds of spaces provided and their interrelationship and the ambience along with interior layout of the library.

3.1.1 Overview

- **Location:** Dhulikhel, Kavre
- **Established:** 2003
- **Building type:** Academic Library
- **Architect:** Saroj P. Shrestha (CED)
- **Orientation:** North
- **Number of Collections:**
 - 56,091 - Volume of books
 - 2500 – CD-ROMs
 - 200 – Videocassettes
 - 125 – Journal titles and newsletters
 - 75 – Audio cassettes



*Figure 75: Kathmandu University Central Library,
Source: self-taken*

3.1.2 Accessibility

The library is accessible by a 24' wide road, with the main entrance on the north side of the building. The building is located inside the university premises and is accessible to both university students and the public. Accessibility for people with disabilities is not taken into consideration.

3.1.3 Program arrangement

Periodical section, technical processing section, Reference section, Stack-cum-reading room, Circulation section, Offices for librarian and assistant librarian, Store are all well

designed. They are all equipped with necessary library furniture and equipment designed by the experts.

The main library is divided into:

- Usable space: Property counter, Reading area, Book stacking area, Lounge area
- Service space: Circulation area, Toilet, Library office, technical processing section

The placement of the service and reading sections in the library is determined by their connectivity and usability.

The vertical zoning is done in a quite different way as the areas requiring quieter are placed on the ground floor

(like periodical section, reading areas) and areas that are public or are noisy (like lounge, group work areas, computer lab) are placed on the upper floors.

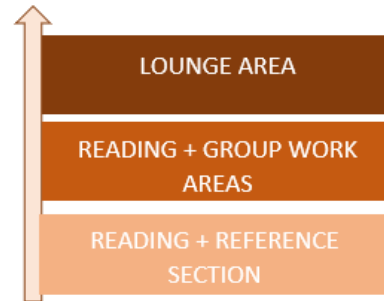


Figure 76: Vertical zoning

3.1.4 Entrance sequence and visual connectivity

The library is strategically situated centrally within the university grounds for easy access (accessible within a reach of five minutes from each and every department).

The entrance has property counter on either side, which is essential to keep bags and other items of the users. The main entrance leads to the central lobby, which connects to the circulation area, periodical/reference section, office, restrooms, and reading area.



Figure 77: Entrance with property counter. Source: Self-taken

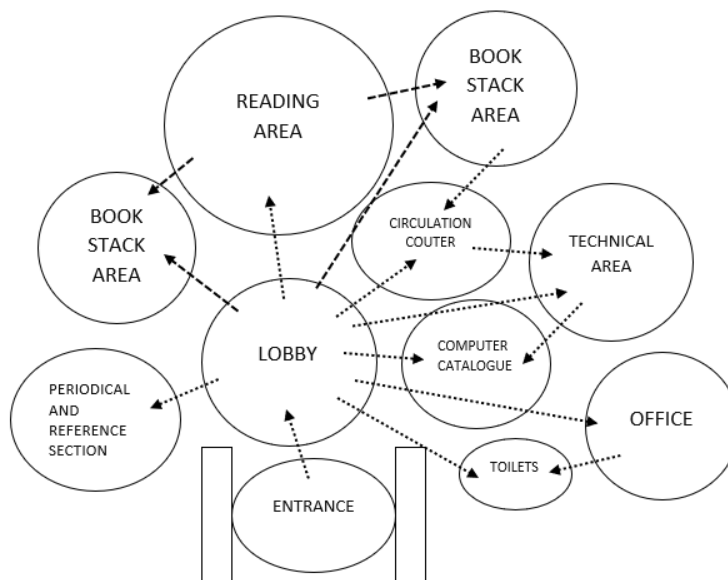


Figure 78: Bubble diagram showing ground floor

Since customers typically utilize the catalog to find the books they desire, it is highly preferred that it be close to the entrance. Similar to this, having the circulation desk, technical area, and librarian's office close to the entrance and the catalog enables patrons to request assistance when needed and enables the library to operate as intended in terms of lending/returning books and adding new volumes.

3.1.5 Layout and design components

The building's hexagonal design allows for stunning exterior views to be seen from inside. The building has a height of 4.05 meters, giving it an open, airy feel and enhancing light in the interior. The library has been designed with spaces such as group work area, for conducting group projects and lounge area for students so that they can come to the library to relax and not just study. The library is more student or user-centered than book-centered, as more areas are available for reading than the book stacking areas.

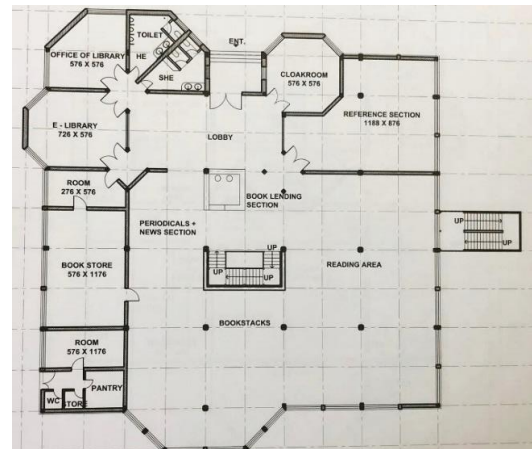


Figure 79: Ground floor plan

Staircase is centrally located which makes it easily accessible. Additionally, it serves as a visual partition between the lobby and the reading space, giving the readers some degree of seclusion. When using the staircase, one can observe the activity below clearly, enabling visual connectivity. (See fig.81)

To enable learning in a more naturally lit environment, reading areas are positioned next to windows. One of the student users describes the area as "very cozy and peaceful" in an interview. The study carrels which are provided for reading, each contain a power socket allowing the users to easily use their laptops to work or study.



Figure 80: Internal staircase.
Source: self-taken

The book stacking is done in room or in designated spaces in close proximity to reading areas allowing users easy access to books while studying. On the ground floor, the books stacks are completely separated from the reading areas for noise control. Also, gypsum board is also used on ceiling for acoustical treatment.



Figure 82: Book stack area.
Source: Self-taken



Figure 81: Reading area.
Source: self-taken

3.1.6 Technology

An electronic catalogue is placed close to the main entrance so students can easily access it to find the books they want. In addition to this, it includes computers with internet access that the students can use to aid in their academic work.

3.1.7 Ideas to engage users

The floor plan is open without much division between spaces, in order to enhance connection and make the space appear larger.

The library has prioritized to create more comfortable spaces for students to study, work, and relax at the library, rather than the book stacking area, which makes students feel more welcome and connected to the library.

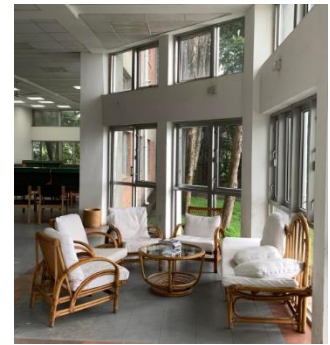


Figure 83: Lounge seating.
Source: Self-taken

There is a dedicated area on the first level for group work. It is just set up in a corner with some furniture without considering the ambience or noise level in the area. Additionally, this space receives no natural light; instead, artificial lighting is used to illuminate it. Also, there is no task lighting, which would be more beneficial in working spaces.



Figure 84: Group work area.
Source: Self-taken

The student lounge area is on the top floor, however as it is more of a public space, it would have been better utilized if it had been on the lower floor. The lack of concern for the surroundings, their features, and their arrangement gives the area a lifeless appearance. Additionally, the lounge area's lack of windows and low ceiling height gave off an uncomfortable feel.



Figure 85: Lounge area.
Source: Self-taken

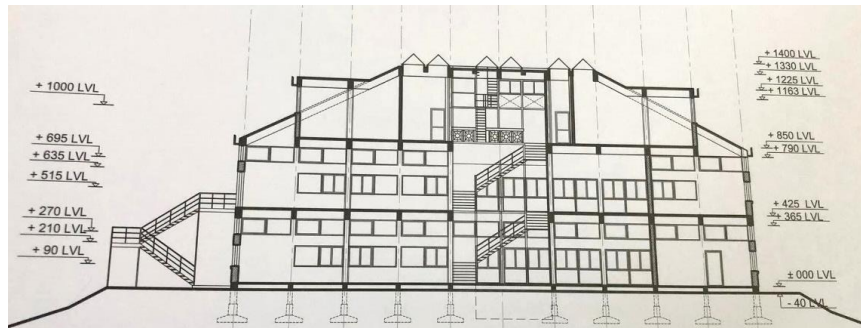


Figure 86: Section of KUCL

3.1.8 Light and ventilation

Due to the utilization of wide side windows and clearstory windows, the interior is well-lit and maintains natural ventilation. The reading nooks are positioned thoughtfully to take use of the breathtaking views offered by the windows. This enables the users to read, take pauses, and look outside in order to reenergize themselves.



Figure 87: Use of windows. Source: self-taken

3.1.9 Color

The walls and ceilings on the ground floor are painted white. The usage of the same color throughout the space creates a unified visual flow that allows the eye to move freely through it and also makes the area appear brighter.

On the first story, the walls and ceiling were white, and the beams were painted green. To blend in with the surroundings and match the study carrel, which was likewise a dark green

color, green may have been chosen as the predominant color. The use of green on the beams in the room somehow constrained the movement of eyes.

3.1.10 Flexibility

Flexibility, which is among the most crucial qualities of a modern library, appears to be lacking in this case. There is not a lot of versatility offered in terms of seating furniture either. The majority of study spaces are designated for independent study and the furniture cannot be joined or moved for group activities. Additionally, there is no room for the expanding book collection in terms of space. The student reading areas will eventually be affected by the growth of books.

3.1.11 Signage and wayfinding

Users can navigate libraries with the aid of signs. However, the absence of signs, in this case, made it difficult for first-time users to navigate the area and identify the locations of various spaces.

3.1.12 Inferences

- Providing visual connection between surrounding landscape and reading areas which creates good ambience for reading
- Natural plants can be added to enhance aesthetic and create friendly atmosphere in the interior.

3.2 TRIBHUVAN UNIVERSITY CENTRAL LIBRARY (TUCL)

The Tribhuvan University Central Library (TUCL), widely regarded as Nepal's largest library, was founded in 1959 with the institution for the exclusive aim of assisting the university in achieving its goals. The current building, which is situated at the university's central campus grounds in Kirtipur, Kathmandu, was built in 1967. 25 years later, an annex building (nearly three times larger than the original one) was built in consideration of the growing number of documents and its continuously expanding patrons.

TUCL serves university faculties, students, and research scholars, but it also serves in a significant capacity as a public library by providing services to government officials, other organizations, foreign scholars, and even the general public.

Since, TUCL is the first and largest university library in Nepal in terms of collection, services and members; I choose this library to recognize the library's components and their relationship and to understand 'back of the house' process of a library.



Figure 88: Entrance of Tribhuvan University Central Library.
Source: Self-taken

3.2.1 Overview

- **Location:** Kirtipur, Kathmandu
- **Established:** 1959 AD
- **Extended date:** 2007 AD
- **Building type:** Academic Library
- **Architect:** Robert Weise
- **Orientation:** East
- **No. of collections:** 285,000 - Volume of books
450 – Journal titles and newsletters
45,000 – Online data base

3.2.2 Accessibility

A 24' wide road leads up to the library building, and the main entrance is on the east side. Both the general public and university students have access to the library block, which is located inside the university grounds. The main building lies almost in the center of the site. There is no designated parking available. The street in front of the main entrance to the library complex is where it is done. People with impairments can access the ground floor but not the upper floors.

3.2.3 Program arrangement

Areas with maximum use are located at the level of the entrance at ground floor and other areas are located above this level reducing the vertical distance to minimum. Quiet study space is far from entrance.

The main building is two storied whereas the annexed building is single storied. The main library is divided into two sections lending section and text book (reference) section. The

section and the stack area in the entrance hall fall under lending section where as all other remaining sections of library are reference section. Basically, books stacks in the library are in both open access and closed access. In open access readers can themselves pick books from selves and put them back where as in closed access required name of the book is given to the librarian and obtained. In TUCL lending section, UN depository, periodicals are in open access whereas thesis collection, Singh collection, American studies section, textbook collection are in closed access.

Main library is divided into following specific spaces:

- Usable space: Reading area, Book stacking area (70% of the building)
- Service space: Circulation, Toilet, Administrative departments (30% of the building)

3.2.4 Entrance sequence and visual connectivity

The entrance has property counter on either side, which is essential to keep bags and other items of the users. As we enter, the circulation desk is on our left and the catalog section is on our right; both places are situated close to one another because of their strong connection. The main staircase is place straight ahead in front of the entrance which makes it easy to access the upper floors.

3.2.5 Layout and design components

The library basically has linear flow in between book stack and reading areas. Proper integration or segregation between these areas was not seen, rather arrangement was quite haphazard. All the administrative areas were placed together which was good.

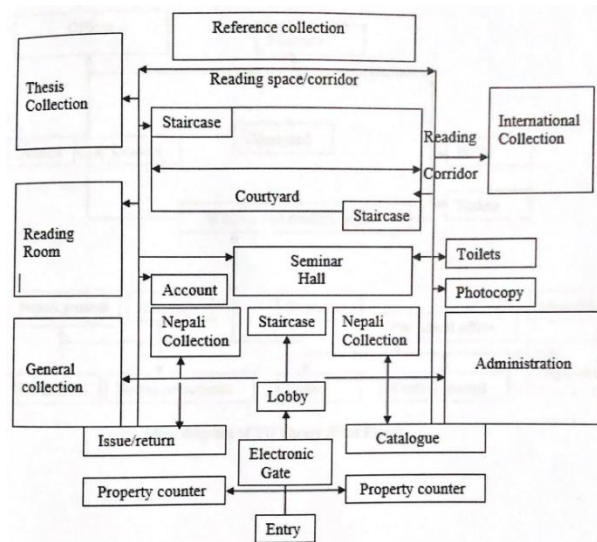


Figure 89: Flow diagram of TU ground floor

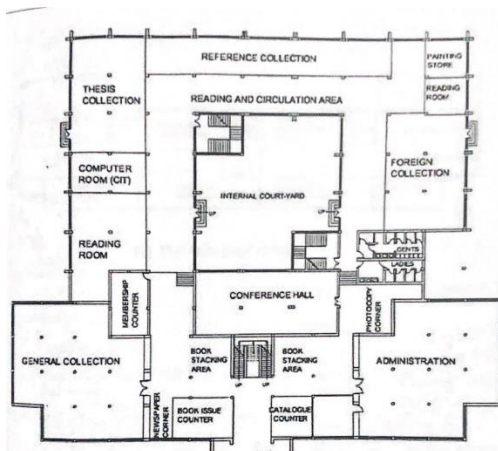


Figure 91: Ground floor plan

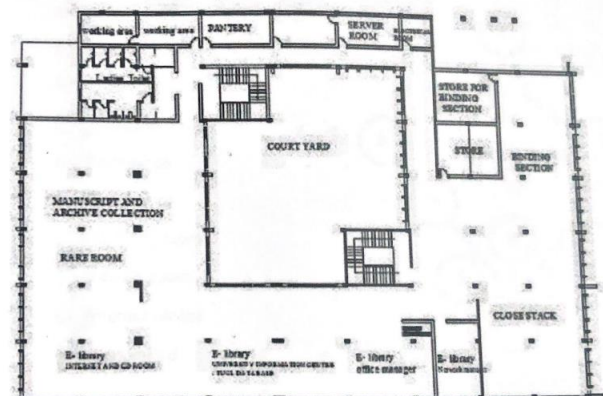


Figure 92: Existing first floor plan

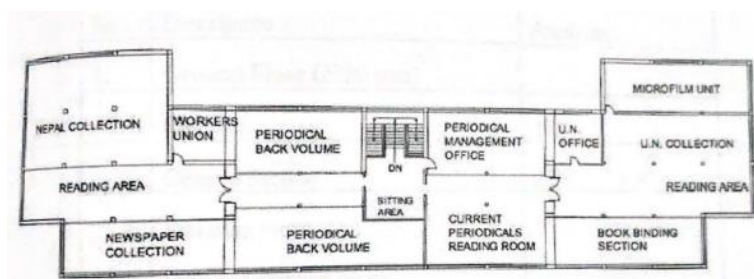


Figure 90: Extended First floor plan

Both card catalogues and OPAC system were in use but the arrangement of card catalogue was also not designated in proper places. (See fig.94 and 95)



Figure 94: Book stacks with card catalogue.
Source: self-taken

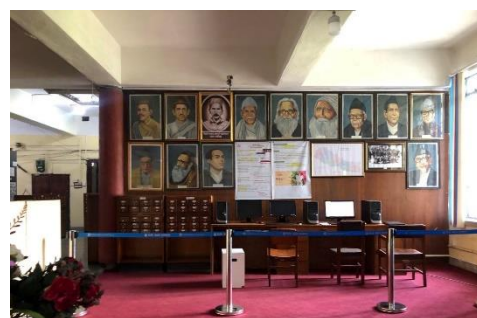


Figure 95: OPAC.
Source: self-taken

The amount of space available to hold the collection appears to be inadequate due to the rise in collection numbers. Additionally, group reading facilities are insufficient, thus temporary structures are built for this purpose outside the library within its boundary. (See fig.96)

3.2.6 Administrative and technical section

The administration is on the 1st floor of the new building and is controller of overall library system. It is the main staff activity floor and has space for administration officers, cataloguing employees, technical employees.

In technical section, necessary tool for acquiring, cataloguing, typing is kept. This is where new books are first brought then registered against the invoice, analyzed, numbered, catalogued, entered into computers, bind and is finally made ready to place in different section of the library. Account section is situated next to the technical section for easy orientation.

3.2.7 Technology

The library has made e-books accessible, and its online databases with IP based systems and free online databases with subscribed as well as unrestricted access are available to users in its e-resource section.



Figure 91: Outdoor reading rooms.
Source: Self-taken

According to the librarian of E-resource section, the size of collection in racks has not been affected by e-library as they do not remove those books which are also present online.

Glare has not been taken into account in design of this area, despite being a crucial issue to take into account when designing areas with computers. Users are affected by glare from windows that directly hit their computer screens.



Figure 92: E-resource area.
Source: Self-taken

3.2.8 Light and ventilation

Natural light is taken through openings on the wall. The central court provides enough light in the interior. Therefore, there is no need to use artificial light in the daytime in reading area, but due to the blockage of extended building portion there is light problem in the staircase and also in some book stacking areas. Seating areas are adjusted around the central court for maximum use of natural light. Shading devices are basically not provided except on the front facade therefore there is glare problem in the some reading spaces. Vertical and horizontal sun shading devices, wide overhangs, outside screens of concrete have been used to counteract the excess light from the glass on one side of the building (east). (See fig.98)

Similarly, the openings and courtyard are enough for ventilation inside the building which creates comfort. There is no other alternative for heating, cooling or ventilation.



Figure 94: Shading device.
Source: Self-taken



Figure 93: Courtyard space.
Source: Self-taken

3.2.9 Signage and wayfinding

There were several signs, which made it easier to find collections and identify their locations.

3.2.10 Acoustical treatment

The library has no acoustical treatment. There are no soundproofing elements on the walls, ceiling, or floor. Due to the seminar hall's absence of acoustical treatments, there is disturbance in other parts of the library.

3.2.11 Security

At the entry and exit, a magnetic security system and guards are deployed to prevent book theft.

3.2.12 Inferences

- Location plays an important role for proper functioning of a library
- Acoustical treatments and glare must be considered while designing
- Group study areas along with study carrels are desired

3.3 WORK AROUND

Work around is an affordable yet comfortable coworking space at Kalopul (on the way to Chabahil from Naxal). Work around started by Tanka Ram Poudel and Dadhi Ram Poudel was inspired by two distinct questions: the first, a personal one, about what to do with the café space left empty, and the second, a more noble one, about how to support businesses who are having a hard time making ends meet.

This case study was done to understand about the facilities that are needed in a coworking space and to understand the condition of coworking spaces in Kathmandu.



Figure 95: Work around.
Source: Google

3.3.1 Overview

- **Location:** Jaya Bageshwori Marg, Kathmandu
- **Established:** 2016
- **Building type:** Coworking space
- **Construction technology:** Bamboo, concrete
- **Objective:** to support startups, entrepreneurs, and freelancers struggling with their daily finances
- **Amenities:**
 - Shared work area
 - Meeting room
 - Private rooms
 - WIFI
 - Printer/scanner/photocopier/Projector
 - Cafe

3.3.2 Accessibility

The coworking space is easily accessible from the main road. It has a café on the front and work around is located at the back of the building. Bike parking spaces are available.

3.3.3 Internal Spatial Layout

The indoor design is excellently set up and has a peaceful atmosphere. With all the furnishings, natural plants, and lighting, not to mention the utilization of bamboo, the inside is wonderful.

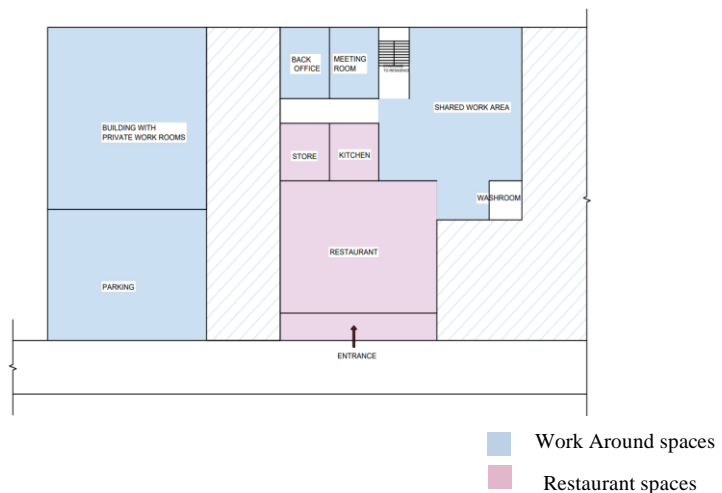


Figure 96: Ground floor plan

After entering the café and going back, a shared work area can be seen with ample space to work, where we can work alone or in a group. Meeting rooms and the main admin or back office is also there. Private rooms have been added, however on a different building, in response to user demand for private areas.

Workaround offers a pleasant environment for working or studying as well as a social setting where you may meet individuals who share your interests or have the skills you are looking for and also a place where you can exchange ideas and increase your networking.

3.3.4 Light And Ventilation

Natural light fills the space, creating a cozy and welcoming atmosphere. The side windows and skylights let in natural light. The usage of windows also maintains proper natural ventilation. If users become overheated, fans are available. Artificial general and task lighting is used to create a well-lit space for people so they can work comfortably.



3.3.5 Ambience

The use of natural plants and plenty of light, ventilation, and other factors contribute to the atmosphere's peace and comfort. The furnished tables and chairs are comfortable to work in. There is not much restaurant noise to distract folks from their job. Free access to water, tea, and coffee is provided for refreshment. When taking a break, users can relax by playing the guitar, chatting with those around them, and the co-founder himself.



*Figure 98: Shared work space.
Source: Self-taken*

3.4 LocHal LIBRARY

The LocHal is a new, world-class urban living room for Tilburg in an iconic former locomotive shed of the Dutch National Railways. The Midden-Brabant Library, the cultural institutions Kunstloc and Brabant C, as well as Seats2meet's co-working spaces are all housed there, right in the center of Tilburg's new City Campus. The LocHal is a place where people of all ages can read, learn, study, meet, and gather. It serves as a location for the most recent technologies to be tested, created, displayed, and presented. (LocHal Public Library: An Intensive Redesign, n.d.)

This case was studied as The LocHal aims to reimagine what a library does in the current digital environment. Both the traditional reader's needs and the generation of new knowledge are met by this institution with variety of space for different activities.



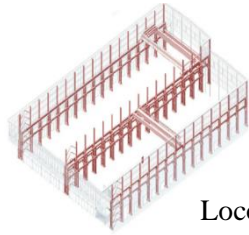
Figure 99: LocHal Library.
Source: archdaily

3.4.1 Overview

- **Location:** Tilburg, The Netherlands
- **Established:** 2018 AD
- **Building type:** Academic Library
- **Architect:** Braaksma & Roos architectenbureau, CIVIC architects, Inside Outside, Mecanoo
- **Size:** 7000 m²
- **Programme:**
 - Library
 - Café
 - Amphitheater
 - Studio spaces
 - Coworking spaces
 - Maker's Lab
 - Meeting rooms

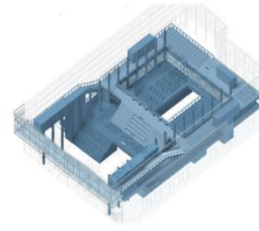
3.4.2 Guiding Principles

The architecture is a reinterpretation of the original building, dating from 1932. The main structure determines the rhythm and language of the new architecture. Perhaps the most conspicuous feature of the building is its sheer size. With a footprint of 90 x 60 meters and a height of 15 meters, it is both imposing and inviting. The spatial design emphasizes the concept. Large open spaces, stairs and open floors add to the value of the monumental hall and the idea of an 'open' library. (LocHal Public Library: An Intensive Redesign, n.d.)



Locomotive Hall

Historic Locomotive Hall forms the basis for the architecture. All traces have been retained.



Interwoven architecture

LocHal is impressive public place: An open knowledge workshop with various labs and space for events.



Movable Textiles

Six massive movable screens can divide the hall and stairwell into different zones for lectures, events.



Colorful Life

Different activities are located side by side in the hall, with different design themes: An interior that is full of diversity.

3.4.3 Entrance Sequence and Visual Connection

The entrance hall takes on the form of a covered city square with large reading tables (doubling as podia), an exhibition area and a coffee kiosk. Space folds up into broad steps which can be used by individuals or as event seating for over one thousand spectators. These steps lead up into the main building, notable for its huge glass façades which provide plentiful daylight. On the second floor, the gallery and stairways allow closer inspection of the historic glass walls as visitors browse the bookcases or make use of the quiet reading areas. One floor higher is a large balcony offering panoramic views of the city. (LocHal Library, n.d.)



Figure 100: The step landscaping after entrance.
Source: archdaily

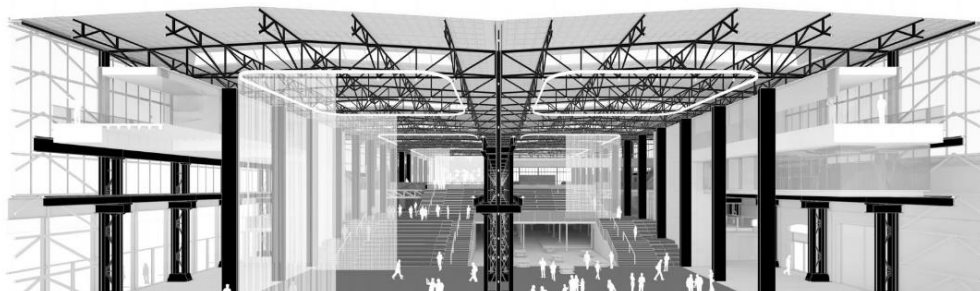


Figure 101: Sectional view.
Source: archdaily

3.4.4 Layout and Design Components

Visitors can browse books or find a quiet place to read in the outer galleries, which are accessible from the main hall by a panorama of stairs. A more fleeting ambience is created higher up by the filtered roof light and the intricate details of the construction. A spacious balcony provides spectacular city views. (LocHal Library, n.d.)

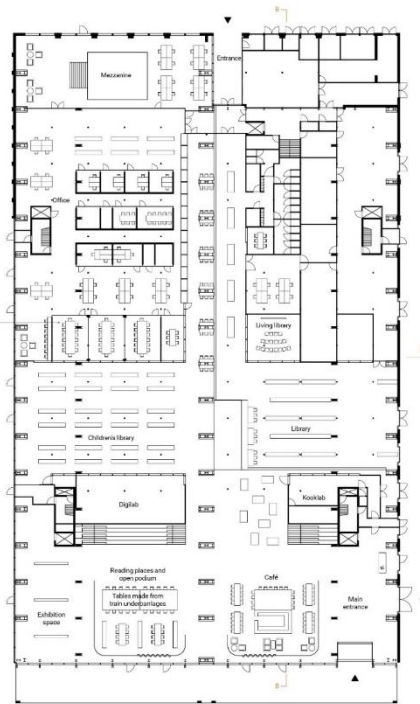


Figure 102: Ground floor plan

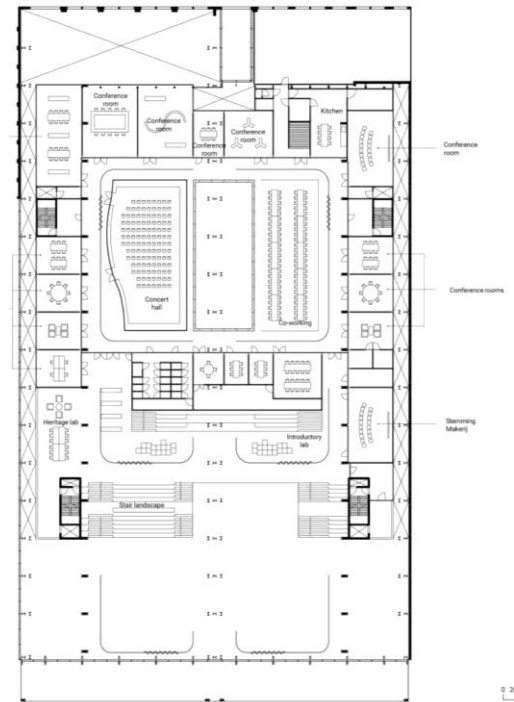
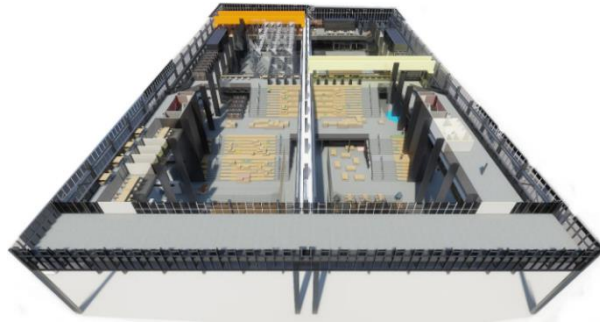
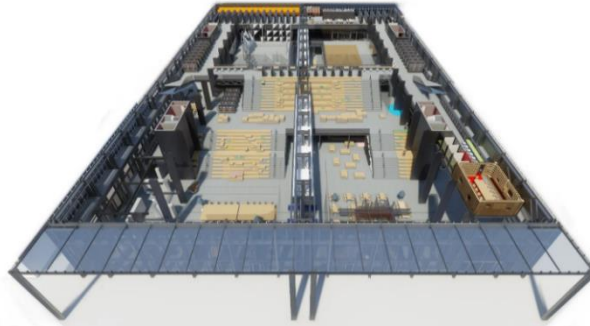


Figure 103: First floor plan

The LocHal has redefined the function of a library in today's digital era. While there are the usual facilities for the traditional 'book consumer', the new library also provides ample opportunity for the creation of new knowledge. This new role is facilitated by the architecture. In addition to various areas for lectures and public events, the library has a number of 'labs' (laboratories) where visitors can learn new skills. These labs, with their remarkable design, can be found throughout the building. There is also the Food Lab, the Word Lab, the DigiLab and the Heritage Lab. The clustering of library, various arts institutes, Seats2Meet and faculties of journalism in the nearby Mindlabs (currently under construction) creates a diverse group of experts who will cement the success of the new library concept. Moreover, the form of the building ensures that the collection, the facilities and the manner in which they are used can be adapted to meet changing requirements. (LocHal Library, n.d.)



BALCONY LEVEL
Offers views of the city outside.



SECOND LEVEL:

- Work spaces
- Private

This floor consists of office rooms with private offices.



FIRST LEVEL:

- Study spaces
- Semi Public

This floor consists of main library including a children's library with few labs.



GROUND LEVEL:

- Informal
- Public

This floor generally consists of public activities like café, exhibition spaces.

*Figure 104: Axonometric view of floor plans.
Source: (LoCHal Library, n.d.)*

3.4.5 Different Spaces

3.4.5.1 City café with reading and exhibition space

The city café, which has a bar with red, brown, and gold ceramic tiles and a neon LocHal logo on top, is the center of attention. It is clearly visible from approaching trains. The concrete floor shows the original railways. Three substantial wheeled "train" tables are moved using them. For instance, a single table can extend the bar; when arranged in a line, the tables create a stage or catwalk, with the steps serving as an audience space. (LocHal Library, n.d.)



Figure 105: Café.
Source: (LocHal Library, n.d.)

3.4.5.2 Interior street

A street inside the structure that crosses it is lined with antique industrial columns that still have old coats of paint on them. The columns are given a new lease on life as areas for reading and studying by adding wooden tables and lighting. The street has bookcases on either side. There are also low transportable display units with welcoming displays of books, just as in a bookstore. Books are borrowed and checked out in this book street. On the office side of the bookcase wall, there are clear display cases for original books and works of art. Additionally, this wall provides workers with the ideal mix of solitude and connectivity to the library. (LocHal Library, n.d.)

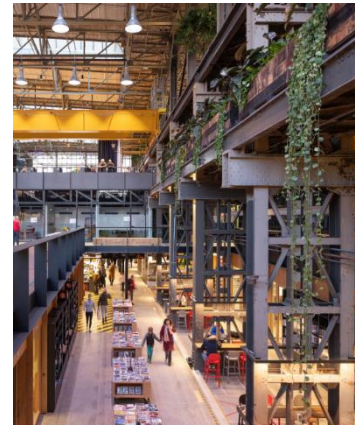


Figure 106: Interior Street.
Source: (LocHal Library, n.d.)

3.4.5.3 Children's library with fantasy theme

The children's library was inspired by the Fantasy amusement park. Bookcases resemble rulers or colored pencils. You can browse the enormous books of fairy tales, hunt for a book, or watch a play. The little ones can lie on open books and read books while listening to storytelling sessions at tables shaped like mobile phones. Even the poufs for sitting have amusing letters that resemble creatures from fairy tales. (LocHal Library, n.d.)

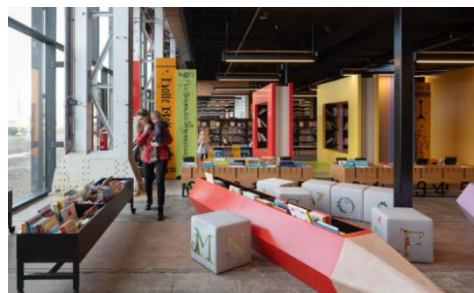


Figure 107: Children area.
Source: (LocHal Library, n.d.)

3.4.5.4 Youth zone with GameLab

The youth zone is lively with vibrant train seats and tables that provide space for various learning environments, including focused work, collaboration, and meetings. The GameLab, one of the several "laboratories" in the building, is also located in this area. (LocHal Library, n.d.)



Figure 108: GameLab.
Source: (LocHal Library, n.d.)

3.4.5.5 Stair Landscape

The enormous LocHal's stair landscape, created by Civic, leads to the top stories. The stairs have oak in some places. Everyone can create their own environment with the adaptable wooden seating components. For instance, you may "create" a space for meetings or a secluded area for solitude work.



Figure 109: Stair landscape.
Source: (LocHal Public Library: An Intensive Redesign, n.d.)

3.4.5.6 Library As a Laboratory

The LocHal is a place where you can be challenged, learn new things, and discover cutting-edge ideas in addition to being a library. The entire structure is filled with these unique labs.

3.4.5.7 DigiLab

Young and old can play with new media and the most cutting-edge technology and software in the DigiLab. You can make your own games or modify images and movies. A green screen and 3D printers are available for filming. Behind delightfully perforated metal doors in bronze, silver, and gold, the DigiLab offers an integrated workspace and a wall of shelves stocked with appliances. (LocHal Library, n.d.)

3.4.5.8 Workshop rooms

Between the children's library and the offices, there are three workshop spaces. They are easily able to be set up as two distinct spaces or integrated into one enormous space because to their flexible walls. External visitors can enter these workshop spaces through the library, and staff members can use office-side access points. (LocHal Library, n.d.)

3.4.5.9 Future Lab

The Future Lab is a place for futurists. Start-ups, students, or businesses can host seminars and deliver presentations here regarding innovative manufacturing techniques and products. A wall of end-grain wood that is whimsically staggered contrasts with the digital screen, which takes up the entire width of the wall. The wall looks to be a vibrant piece of art because to the shadow play created by the sticking-out and vanishing pieces of wood. (LocHal Library, n.d.)

3.4.5.10 Kennismekarij (Learning Lab)

On the first floor is where you will find the KennisMakerij. It is the large stage made out of used books. They are stacked in various heights, and an oak counter top them all. You can sit on the "stair tribune," which connects the first and second levels, for a meeting, lecture, or performance. The open layout of the room encourages conversation during book discussions and presentations. (LocHal Library, n.d.)



Figure 110: Visual connection from The KennisMakerij (LearningLab) and the eye-catcher city café.

Source: (LocHal Library, n.d.)

3.4.5.11 Food Lab

The FoodLab is for food lovers. Something is always available to sight, smell, taste, or feel. But this portable oak and steel kitchen also offers some thought-provoking material. The FoodLab may be utilized at events in the LocHal because it is mobile. (LocHal Library, n.d.)

3.4.5.12 Tijd Lab (Time Lab)

You can stroll around Tilburg's past, present, and future in the TijdLab. This department not only houses the Library's Tilburg Collection, but also many items, images, and videos related to the city. There are also oak tables - with a poem here and there - for concentrated or collaborative activities. (LocHal Library, n.d.)

3.4.5.13 StemmingMakerij (Dialogue Lab)

The StemmingMakerij is a platform for those who wish to be heard. There is enough capacity in this enclosed area for sixty individuals to attend meetings, shake-ups, presentations, or workshops. Different arrangements can be made with the vibrant round benches. Presentations and movies can be viewed on the digital screen. The glass and acoustic walls are covered in a colorful string curtain. (LocHal Library, n.d.)



Figure 111: Dialogue Lab.
Source: (LocHal Library, n.d.)

3.4.5.14 Word Lab (Writing Lab)

For those who enjoy language, literature, and creative writing, The WoordLab serves as a gathering space and an incubator. The vast linguistics and literature collection is kept at this unique area at the top of the LocHal. Doors that are incorporated into the shelves of the bookshelves conceal a screen that is built into them. The four sections of the hardwood table with the abstract printed design allow you to work individually or in groups. (LocHal Library, n.d.)



Figure 112: Writing Lab.
Source: (LocHal Library, n.d.)

3.4.5.15 Offices

The office space is shared by the Library, Kunstloc, and Brabant C and offers a variety of workspaces. Open office areas, "touchdown" locations for quick work, collaborative spaces, meeting locations, and a coffee corner are all included. The office space is separated from the interior street by a wall of oak bookcases. A whimsical composition is created by the placement of transparent display cases and lockers. Tall steel cabinets on the south side designate conference and work areas. (LocHal Library, n.d.)

A lowered working pit, where oil was once collected, has been transformed into an orange furniture element. This element includes a mezzanine level with places for concentrated work and a view to the outside. The playfully staggered stairs serve as an informal workplace and lead to the lowered working pit. The working pit serves as a stage that is lowered, while the steps serve as seating for staff meetings and presentations. (LocHal Library, n.d.)

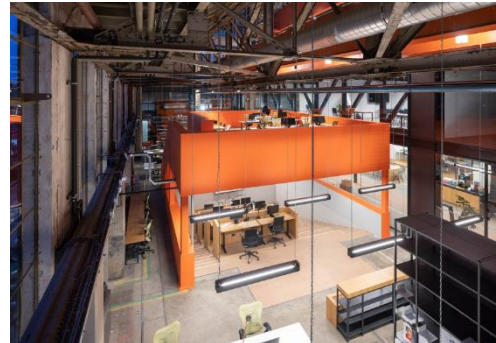


Figure 113: Office space.
Source: archdaily

3.4.6 Textile Architecture

Amid all this openness, certain events and activities may require for smaller scale or a degree of privacy. Six large textile screens are designed which allow for variable room division and enhance the acoustics. These screens, which have a surface area of 4125 m², can be rearranged in a variety of ways. They can be adjusted, for instance, to create a barrier between the co-working space and the upper library floors, or they can be placed across a staircase to create a tiny, semi-private auditorium with the right acoustics and lighting. They enhance the current spatial arrangement when combined with the concrete flooring and black steel columns. (LocHal Public Library: An Intensive Redesign, n.d.)

When positioned in front of the windows on the south side of the building, the screens soften the light that floods through the tall glass façades into the inner square. As the sun hits their transparent surfaces, the curtains turn into tall waterfall, becoming an integral part of the spacious interior landscape. (LocHal Public Library: An Intensive Redesign, n.d.)

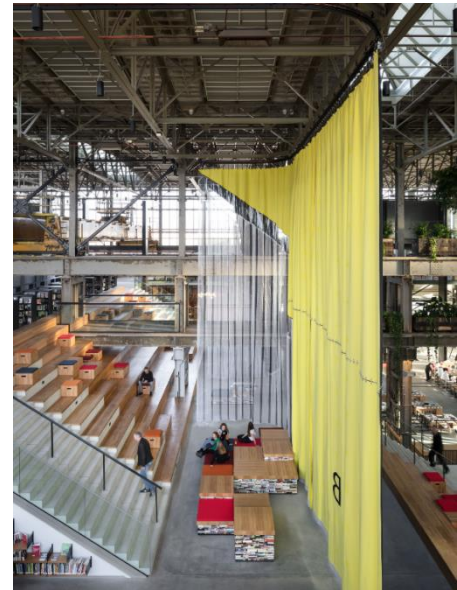


Figure 114: The textile walls designed by Inside Outside, inspired by Tilburg as a textile city, create intimate spaces in this large hall.
Source: (LocHal Public Library: An Intensive Redesign, n.d.)

3.4.7 A Robust décor

The atmosphere of the building is that of a productive knowledge institute. The main structure, various original features which have been carefully preserved and the new additions make use of ‘honest’ materials such as black steel, concrete, glass and wood, applied over large surfaces. The architectural language is determined by the primary structure, while the details adjust to the building's scale. When examined closely, floors, columns, and stairways exhibit their distinctive textures, especially in daylight when the subtle shadows cast by the delicate window frames and translucent textile panels interact with them. (LocHal Public Library: An Intensive Redesign, n.d.)



*Figure 115: Robust interior.
Source: (LocHal Library, n.d.)*

3.4.8 Inferences

- The lack of rigid walls encourages individuals to walk around and explore various areas.
- The library becomes more active as a place of comfort, learning, collaboration, and encounters.
- By encouraging casual browsing, the library becomes larger, more open, and more connected with other activities.
- The café and lounge located at the entrance point helps to create a pleasant and cozy environment.
- The numerous levels allow for the formation of public, semipublic, and private zones.

3.5 SEATTLE CENTRAL LIBRARY

In May 2004, the Seattle Public Library officially opened. The concept involves the reinvention of the library as an access point to information presented in a variety of media. “The new library does not reinvent or modernize traditional, they are just packaged in a new way,” explained OMA in a study. The Seattle Central Library redefines the library as a place where all engaging kinds of media—both new and old—are presented equitably and comprehensibly, rather than as an institution only devoted to the book. In a time when knowledge is accessible from anywhere, the library is increasingly significant due to the simultaneity of all media and, more crucially, the categorization of their content. (Seattle public library, n.d.) Because it is a remarkable building that mixes futuristic lines with library function this study was done to understand the allocation of functional and social space along with the planning features of the modern public library.



Figure 116: Seattle Central Library,
Souce: archdaily

3.5.1 Overview

- **Location:** Seattle, USA
- **Year:** 1994-2004
- **Architect:** Rem Koolhaas, OMA, Joshua PrinceRamus, LMN architects
- **Project type:** Library
- **Programs:**
 - Meeting rooms
 - Library
 - Multimedia lab
 - Auditorium
 - Kid’s zone
 - Learning center
 - Cafe

3.5.2 Guiding Principles and Research

The core idea behind OMA's design approach was to reimagine the library as an organization that was no longer solely devoted to the book but rather as an information bank where all powerful types of media, both new and old, are presented equally and comprehensibly. At a time when increased digitalization and a diminishing public sphere are thought to be endangering libraries, Rem Koolhaas blends these two seemingly incompatible impulses to build a flexible civic space. (Seattle public library, n.d.)

3.5.3 Program Arrangement

In modern libraries, flexibility is envisioned as the development of generic floors on which virtually any activity can take place. Programs are not divided, and rooms or other individual areas are not given distinctive personalities. In actuality, this implies that bookcases initially designate ample reading rooms but eventually begin to intrude on the

public area due to the collection's continuous growth. In the end, the flexibility of the library chokes out the very features that set it apart from other information sources.

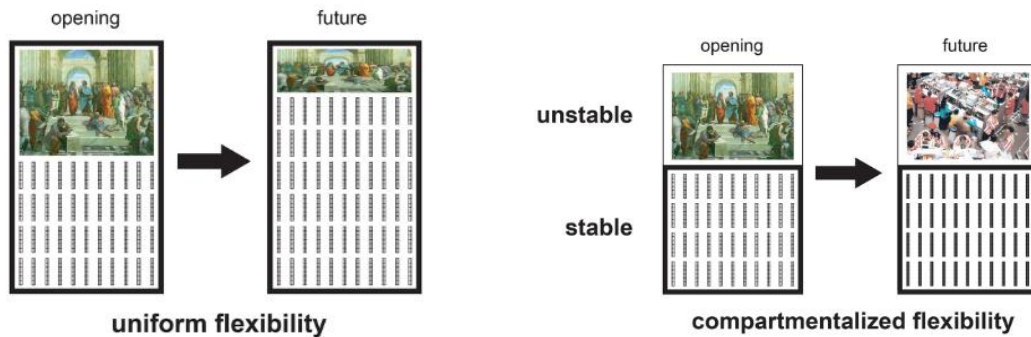


Figure 117: Flexibility space diagram in Seattle Central Library.
Source: rex-ny.com

Instead of maintaining its existing unclear flexibility, the library may adopt a more sophisticated strategy by dividing its space into areas that are each equipped and dedicated to carrying out particular tasks. Each compartment can still be customized, but there is no longer a concern that one area will hamper another. They came to the conclusion that there were two different kinds of program functions: stable and unstable. The stable ones required stable conditions and did not itself indicate movement. The unstable ones were primarily areas where any form of exchange or movement might occur. (Seattle public library, n.d.)

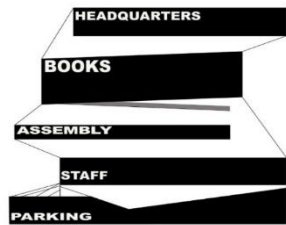


Figure 120: Vertical zoning of programs

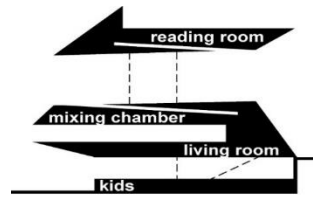


Figure 119: Vertical stacking of in-between

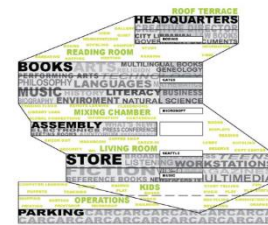


Figure 118: Final zoning and staggered massing

Those stable functions included the headquarters of the library, the book storage, meeting rooms, staff offices and the carpark. The unstable functions which imply a greater amount of movement of people where librarians inform and stimulate, where the interface between the different platforms is organized—spaces for work, interaction, and play are placed between the stable functions. (Seattle public library, n.d.)

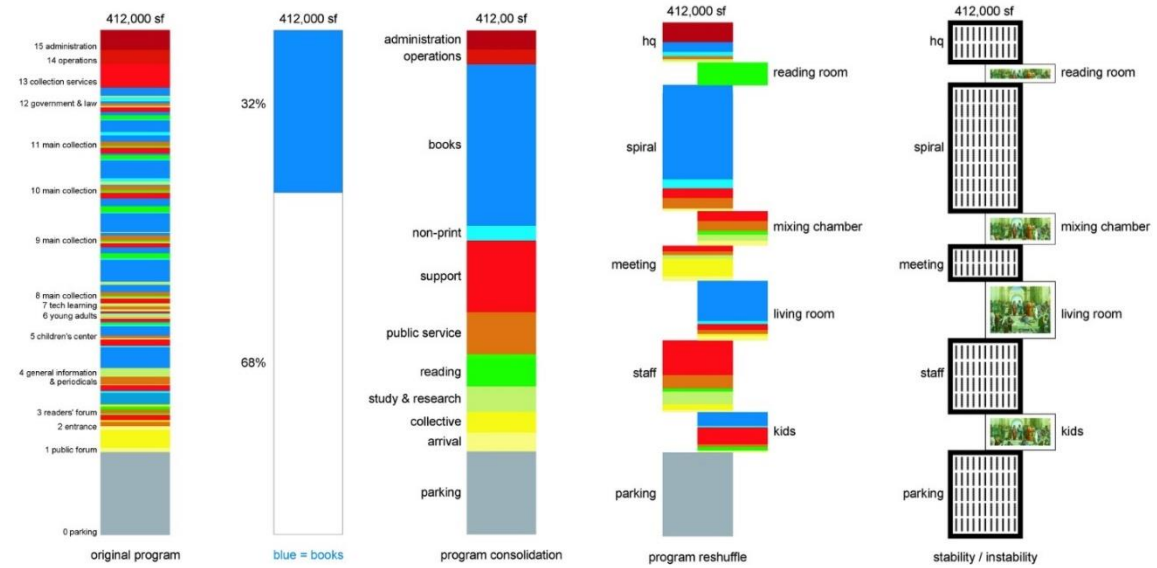


Figure 122: Program analysis. Source: archdaily

3.5.4 Entrance Sequence and Visual Connection

Situated on a sloping site between 4th and 5th street the new library has entrances on both street levels. The entrance level on 4th Street, one of Seattle's main thoroughfares, houses the Children's Library and foreign language resources. The “living room” lobby can also be reached directly from a covered walkway than runs the length of the 5th Avenue façade. (Seattle public library, n.d.)

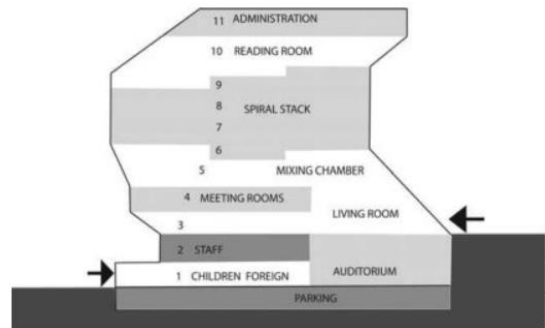


Figure 123: Vertical zoning. Source: researchgate



Figure 124: The 5th level entrance into living room. Source: flickr, Russell C. Smith

3.5.5 Layout and Design Components

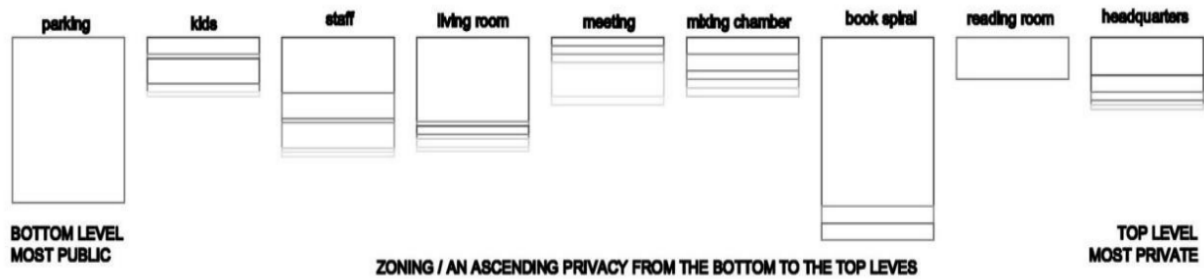


Figure 125: Zoning in Seattle Central Library.
Source: R. Aytül Baran

Zoning or organizing the areas in the library according to their level of privacy is the first step in the design process. A rising privacy level is suggested, with the lowest level being the least private and the highest level being the most private. The concerns with crowds, noise, and social interaction are somehow managed in this way. To give an example, the living room is located on the entrance level and is accessed by practically everyone entering the library, whereas the headquarters are located on the top level and almost no unwanted user enters this portion. (Baran, 2013)

- Level 1

Accessible via Fourth Avenue at this level is the large hall of 1200 m² public computer section, a front desk, public phones, auditorium, language learning center and kid’s zone. (Seattle public library, n.d.)



Figure 127: Language learning center.
Source: archdaily

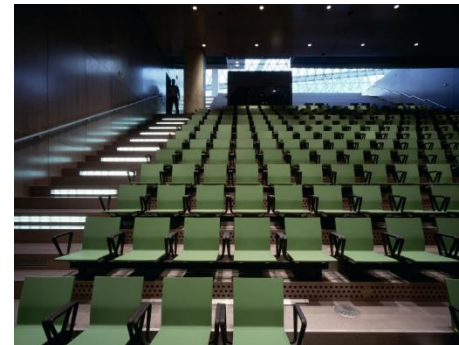


Figure 126: Auditorium.
Source: archdaily

- Level 2:

Level 2 is for staff and is not open to the public. From this level the sending, receiving, sorting and technical services of books and collections are performed. (Seattle public library, n.d.)

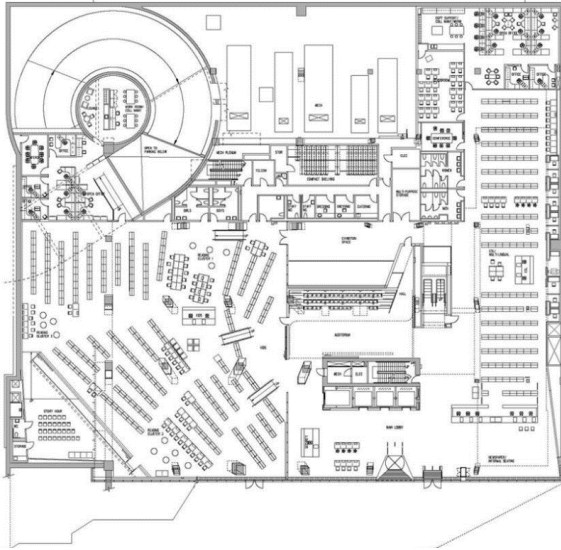


Figure 129: Level 1 plan

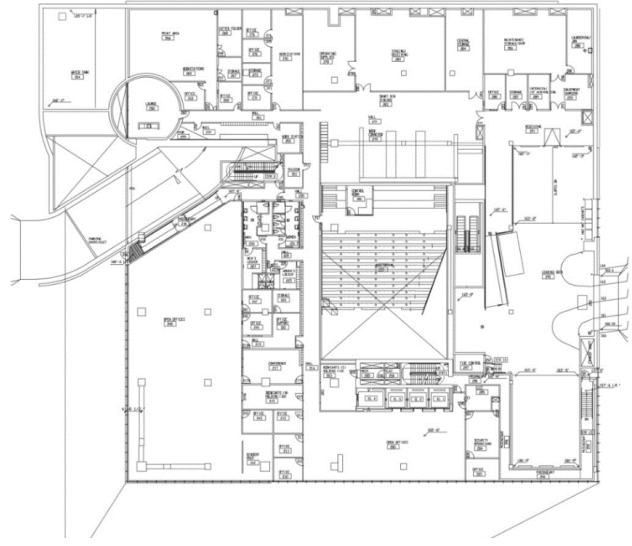


Figure 128: Level 2 plan

- Level 3:

The Living Room constitutes the main part of library housing the entrance and main circulation area which can be reached from the city level. Another architectural element enhancing the publicity of Living Room and connecting it to the deeper parts of building is the atrium. The inner courtyard (or atrium), which pierces the levels beginning from the living room up to the top level of headquarters, creates visual links between various spaces and activities. While one searching a book in the book spiral, may see the dancing people in the living room. (Baran, 2013)

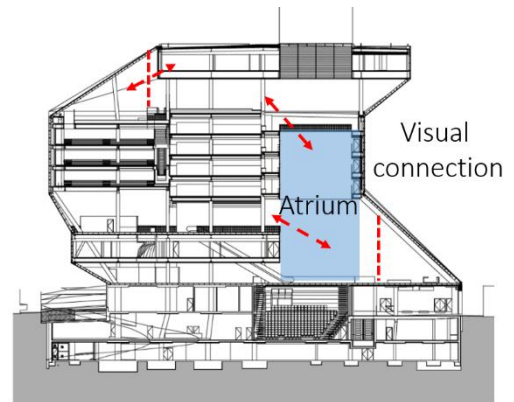


Figure 130: Section North-South

Similarly, triple height space is generated in the entrance of 5th street or the level containing living room, which adds depth to the area and allows in more natural light. The dramatic space allows visitors to look up to see the meeting rooms on level 4, Mixing Chamber at level 5. (Baran, 2013)

The Living Room provides open access for everyone while being equipped with diverging facilities such as a coffee chart which can be claimed as an activity-wise comfort provided especially for this area to promote the space use. Additionally, the choice of furnishings and finishing touches like the floral-patterned carpet or planting pool are all efforts to give

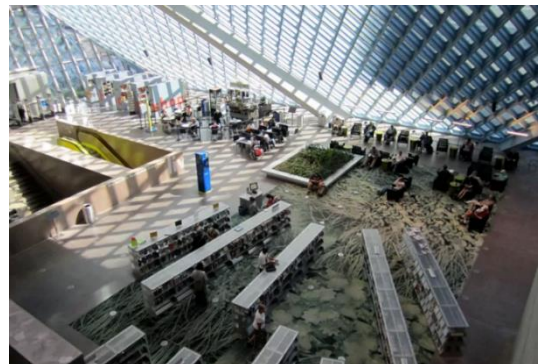


Figure 131: The living room.
Source: doublestonesteel.com

library patrons a sense of belonging. The fact that there are no tight regulations governing how to use the space is another public feature of this area. Users are not forced to adhere to all the traditional library norms, such as maintaining silence and abstaining from beverages, in various areas of the building, particularly in the Living Room. To be more precise, the living room encourages a variety of activities as opposed to a reading room, which restricts activity to reading and studying and necessitates a quiet, activity-controlled environment. To illustrate; it is used as a café, as gathering spot, and even as a dance stage. (Baran, 2013)

Moreover, this publicity of Living Room is promoted by introducing complimentary programs. The location of the Auditorium and its relationship to the Living Room are noteworthy in this regard. In a building complex, auditoriums typically have their own entrances and foyers. The Auditorium, however, is envisioned in SPL as an addition of the Living Room, linking it to the Children Center. Moreover, there is a mutual relation between the Living Room and Auditorium. The Auditorium serves the Living Room as a sacred hub for designated activities, whereas the Living Room acts as the foyer of the Auditorium, enhancing its publicity. (Baran, 2013)

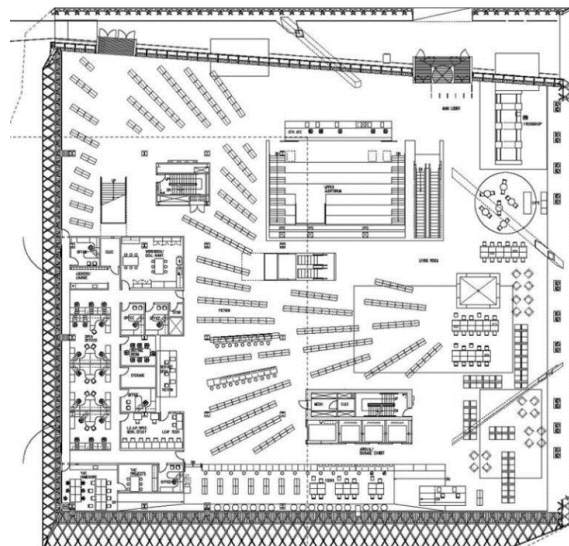


Figure 132: Level 3 plan

- Level 4

Level 4 has four large meeting rooms. The hallway walls, floors and ceiling are painted in deep shades of red and pink, while meeting in appealing colors and neutral tones like brown and gray. Two laboratories Technology Training Centres, Boening are used for public and personal computer instruction.



Figure 134: Meeting room lobby area.
Source: Source: rex-ny.com

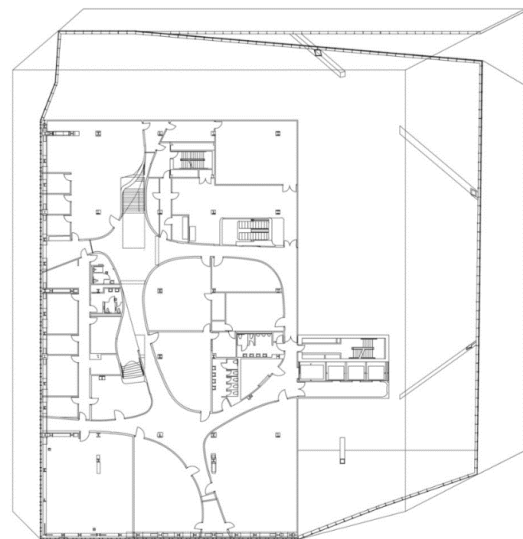


Figure 133: Level 4 plan

- Level 5

By shifting the floors, shortening or compressing, and widening them, interrelations of spaces and the form gets altered. For instance, by detaching book spiral and meeting spaces, an in-between space is created where the mixing chamber is placed. Mixing chamber can be regarded as the reinterpretation of the reference room in the traditional library. However, in mixing chamber, the definitions of information supply and the role of users are not limited to traditional reference room. (Baran, 2013)

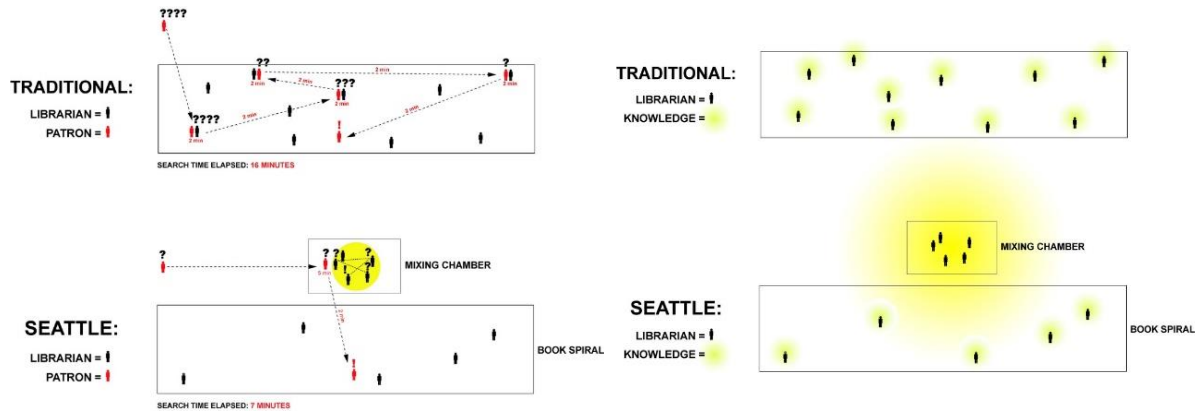


Figure 135: Differences between traditional and Seattle library. Source: archdaily

This level houses the “mixing chamber” where visitors flock to for help in general and research issues. In this area the largest computer lab, the Employment Resource Centre, workbooks and study, scanners and image editing, updated telephone directories, encyclopedias, bulletin board community, and public review documents are located. (Baran, 2013)

The study carrels in the Mixing Chamber at the Seattle Central Library are a cross between group tables and the study carrel. They are furnished with low barriers for semi-privacy. (Seattle public library, n.d.)

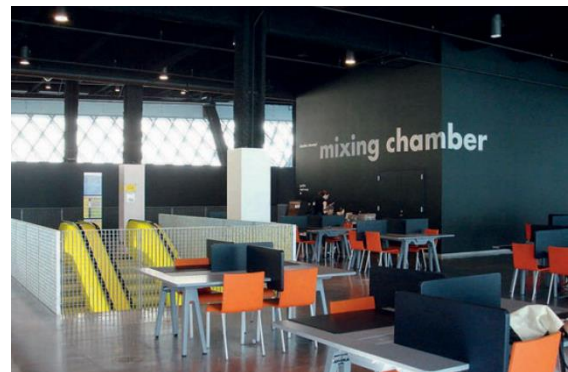


Figure 136: The mixing chamber. Source: archdaily

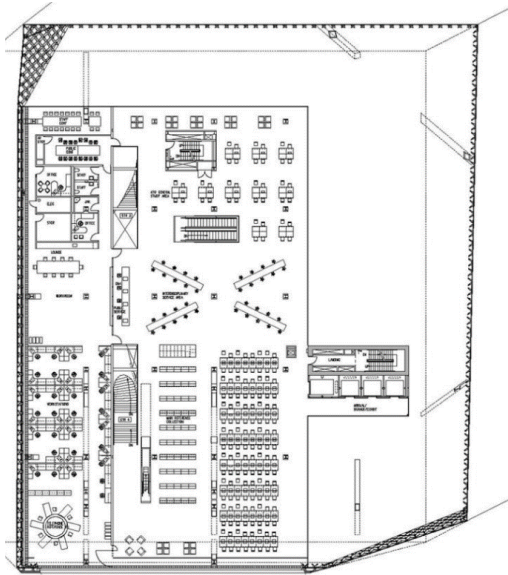


Figure 138: Level 5 plan

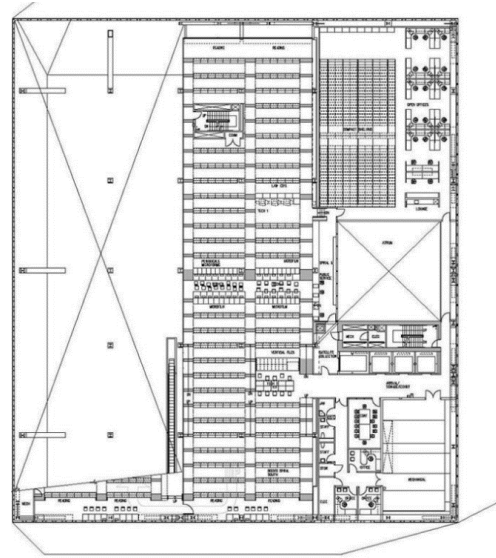


Figure 137: Level 6 plan

- Level 6-9

BOOK SPIRAL

The Book Spiral (level 6-9) is designed as a continuous ramp, which enables people with mobility difficulties to circulate all through literacy section. Besides, this uninterrupted circulation through the collection in Book Spiral, enables easy future expansion of the catalogue without fragmenting the sections. (Seattle public library, n.d.)

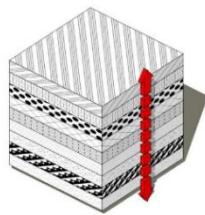


Figure 139: Old system, books would be split among separate floors making it hard to stroll along and find required books

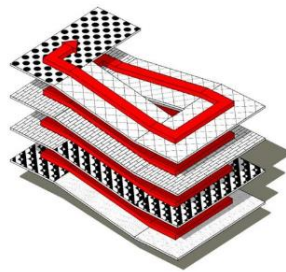
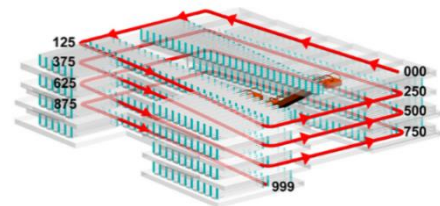


Figure 140: Book spiral, books arranged along a linear sloping path allowing visitors to stroll along the passage of books



Floor plates are used to organize departments. The Book Spiral implies a reclamation of the much-compromised Dewey Decimal System. By arranging the collection in a continuous ribbon—running from 000 to 999—the subjects form a coexistence that approaches the organic; each evolves relative to the others, occupying more or less space on the ribbon, but never forcing a rupture. The Spiral’s 6,233 bookcases housed 780,000 books upon opening, with flexibility to grow to 1,450,000 books in the future (without adding another bookcase). (Seattle public library, n.d.)

- Level 10

This level consists of the reading room, which is a spacious area allowing the users generous views of the outside while they can comfortably read. This area consists of a four-person lounge chair with its non-directional cruciform divider which is highly versatile.



Figure 141: Reading room.
Source: archdaily

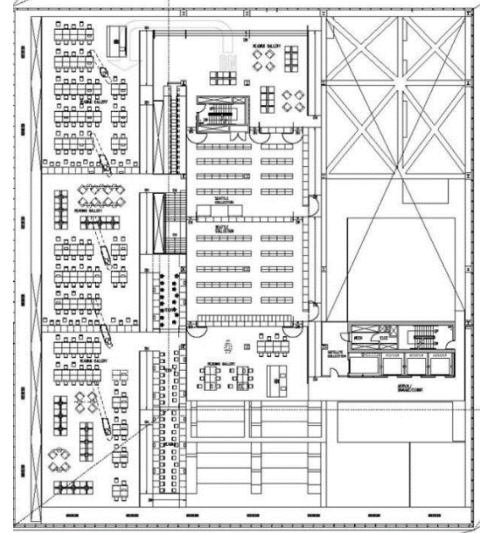


Figure 142: Level 10 plan

- Level 11

The Level 11 has administrative offices, including the office of the City Librarian, Virginia Burnside Board Room, Human Resources and the staff cafeteria. (Seattle public library, n.d.)

3.5.6 Nature And Design of Spaces

The spaces are broken by the horizontal movement inside the building. Various ramps, escalators emphasize the vertical movement instead of straight vertical circulation. This allows users more time to take in the ambience and various spaces visually. (See fig.145)

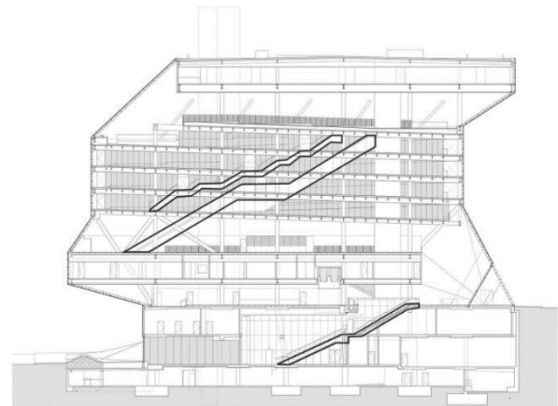


Figure 144: Section East-West

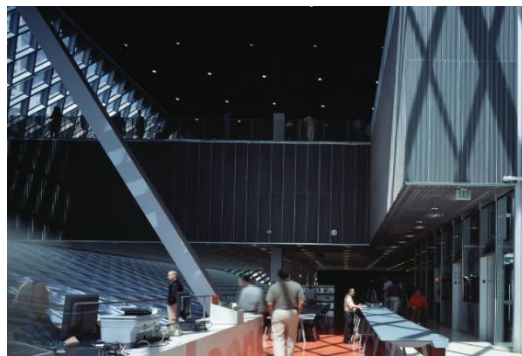
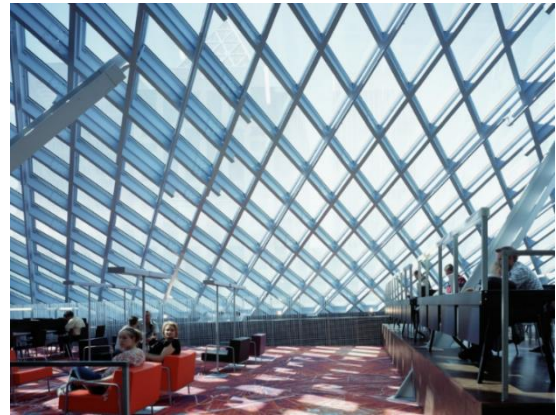


Figure 143: Showing relation between different levels: living room to teen area.
Source: archdaily

3.5.7 Light and Ventilation

Not only a sustainable feature, the utilization of light was crucial to every aspect of the library's design. Every aspect of the structure was designed to maximize natural light, from the external maze of windows to the inner 11-floor atrium and polycarbonate ceiling that help diffuse light to the glass walls that separate the sides of the spiral stacks. Following this primary design principle, the design team decided to use translucent acrylic for the top and end panels of the shelving since they didn't want the book stacks to act as a visual barrier (Library Revolution, Seattle, WA, n.d.)



*Figure 145: Natural light in the interior.
Source: archdaily*

The thermal performance of the envelope was crucial to the curtain wall's design development. The outer envelope is made entirely of vision glass, with the exception of the roof, louvers, and exposed concrete foundation walls. The glass panels exposed to the greatest sunlight have an aluminum expanded metal mesh interlayer to reduce solar heat gain that occurs throughout the summer. Mini-louvers built within the mesh allow for views of the outside while still blocking out direct sunlight. (Library Revolution, Seattle, WA, n.d.)

3.5.8 Color

The stairs, entrances, public meeting areas are painted red and lime yellow. Inside, the metal structures are painted baby blue.

3.5.9 Signage and wayfinding

Abundant, clear signage is provided throughout so that users can easily find their way in the library.



*Figure 146: Signage.
Source: archdaily*

3.6 Component case study of café Evoke

Study of a café was done in order to understand the basic layout and functioning of a café. The requirements and design guidelines were found out after the study.

CAFÉ EVOKE

The café is located in Jhamsikhel area. It consists of both indoor as well as outdoor café. Ample parking space is available and various different shops are also present inside the café. A hall is also available for any type of events.

FEATURES

Indoor dining, Open/Semi open dining, Bar, Hall, Other areas: House of Palettes, The local project, Inkprovised tattoo, Ne Nepal and many more.

COMPONENTS OF CAFE

- Dining area (60% of total area)
- Kitchen (Production/Serving) (40% of total area)
- Storage



Figure 147: Cafe Evoke, Source: Self-taken



Figure 148: Indoor Cafe. Source: Google



Figure 149: Outdoor Cafe. Source: Self-taken

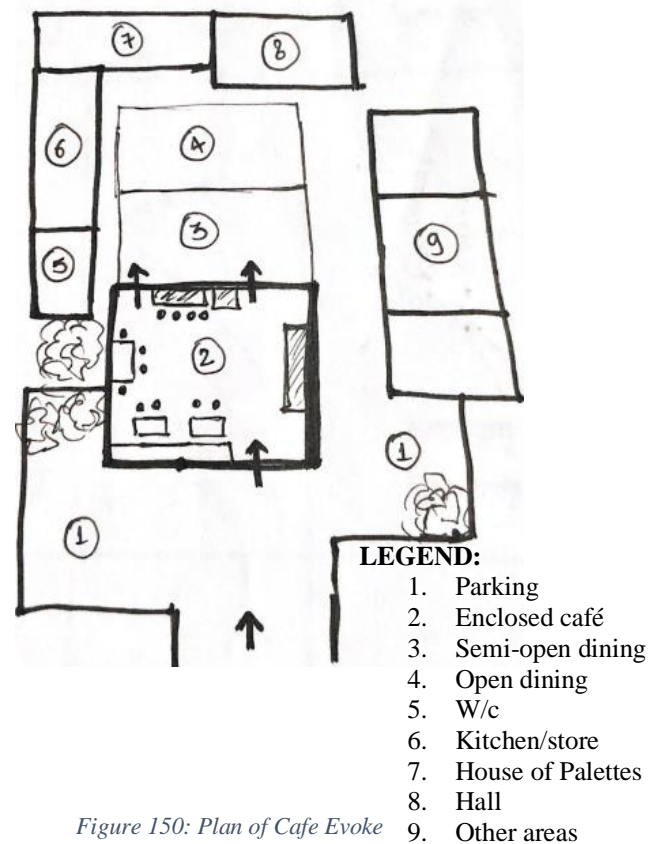


Figure 150: Plan of Cafe Evoke

4. SITE

4.1 Site selection criteria

The location of public library plays a major part in its success. library cannot expect the patrons to walk or drive a considerable distance just to use books. In today's world of full schedules and busy lives, library is well-advised to make themselves conveniently accessible to large crowds. So, it is recommended when acquiring site for library, the following criteria should be considered.

- Accessibility
- Relation with other buildings
- Visibility
- Site capacity
- Travel distance
- Utilities availability
- Legal matters

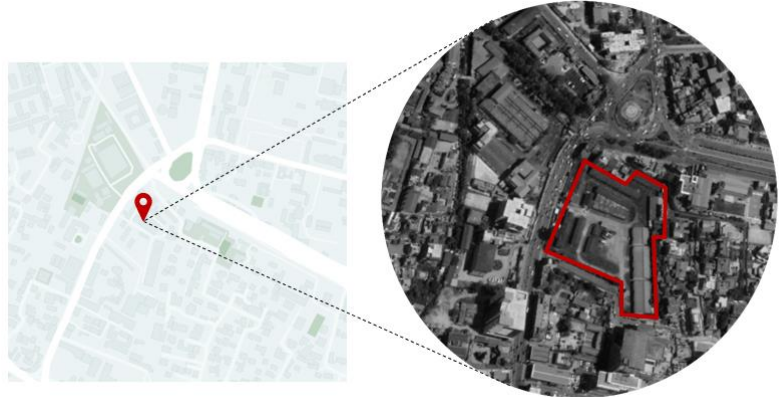


Figure 151: Site map

4.2 Site introduction

The site is located in Maitighar, Thapathali, currently accommodating Nepal Food Corporation. The site is easily accessible to both pedestrians as well as vehicular users and can become an image of public space in core area of the city. The findings from literature review suggested a city core area for better functioning of a library, therefore, this site was chosen. The site is located in reasonable proximity to well-known education institutions as well as offices and corporate buildings.

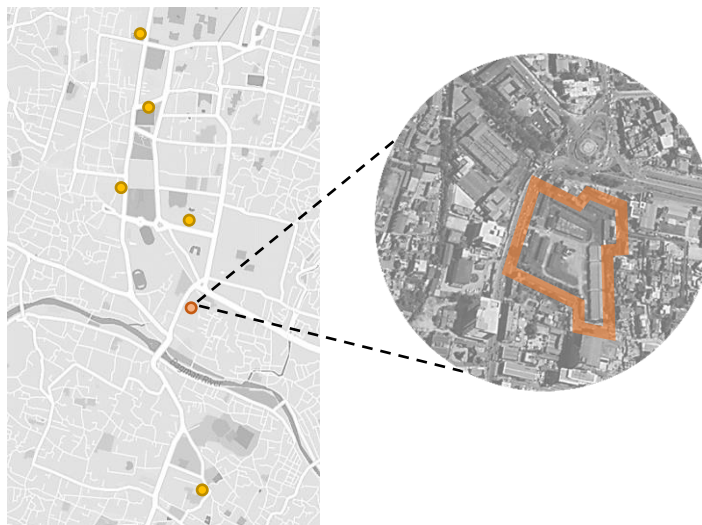


Figure 152: Location of present libraries

4.2.1 Site overview

- **Location:** Maitighar, Thapathali, Kathmandu
- **Coordinates:** 27° 41' 37.06" N, 85° 19' 11.57" E
- **Area:** 14, 484, 58 m² (28-7-2-0.74)
- **Topography:** Slight slope with a difference of 3m
- **Zone:** Commercial sub-zone
- **Land use:** Currently used by Nepal food cooperation

4.3 Site Surrounding

- North: Government offices
- North west: Access Road, Thapathali campus
- North east: St, Xavier’s college, Residential area
- South: Trade tower
- East: Residential area
- West: Commercial

Index:

- Site
- Public space
 - Maitighar
- Commercial buildings
 - Trade tower
 - Furniture land
 - Showrooms
- Educational institutions
 - Thapathali Campus
 - St. Xavier’s college
 - Everest college
 - PEA
- Bus stops

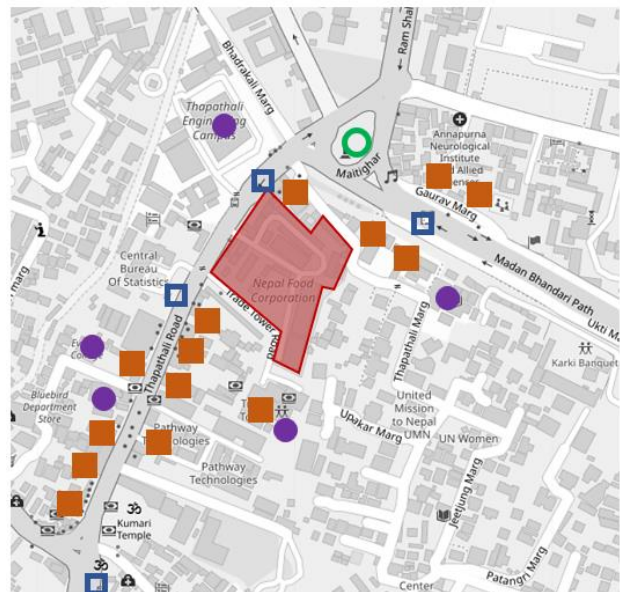


Figure 153: Public services and landmarks

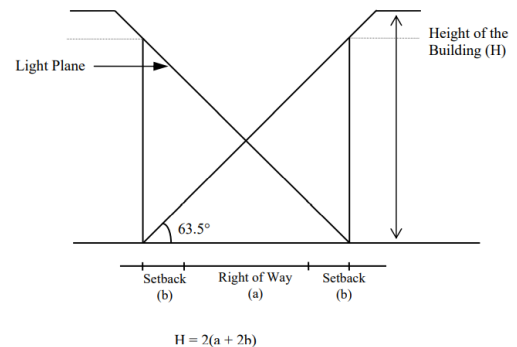


Figure 154: Major landmarks around the site

4.4 Bye-Laws

According to the bye-laws of Kathmandu Metropolitan City, the site lies in commercial sub-zone of residential zone. The site is surrounded by commercial, residential, institutional and office buildings. Following is the regulation for the project as per byelaws:

- FAR: 2.5
- Ground coverage: 40%
- Maximum height: 26m
- Parking: 20% of site
- Light plane



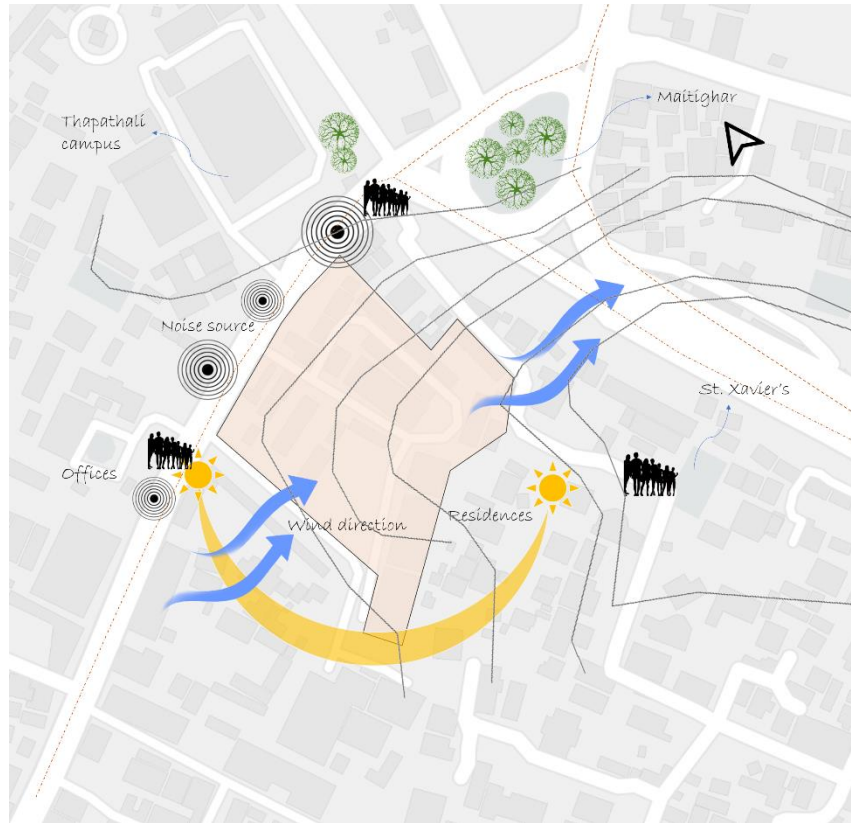


Figure 155: Site analysis

Strategic location of site beside main road and also in the node of two main roads, increases its visibility to passerby which is a benefit for this project. Also, site being located in a wide range of community context, the proposed designed must address the needs of the surrounding community. There are no open areas for the people near the site (beside Maitighar; which is not easily accessible). So, there is the need for an urban plaza where people can gather for events and for daily interaction. This plaza will further help to attract the citizens into the building complex and help to create an active space for the people.



Figure 156: Photos in and around the site

4.5 Site Access

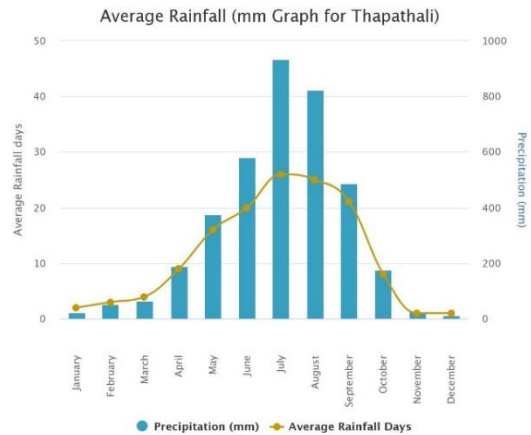
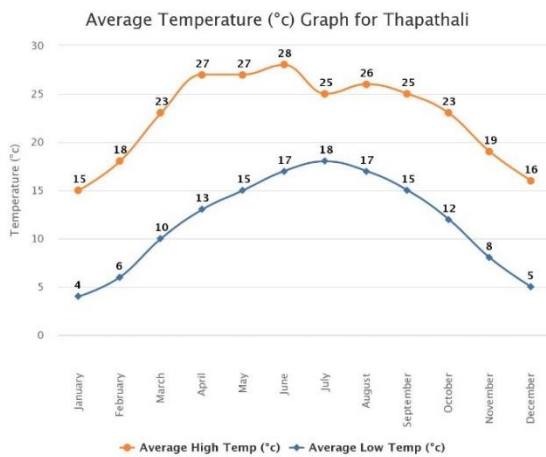
The major access road is on the southwest side and is 11.5m with a 2m side pedestrian path. On the north and south sides, there are also two subsidiary roads, each measuring 5m wide. The northern road goes towards St.Xavier’s college and the other on south side leads to Trade tower.

4.6 Infrastructure

The site has all necessary amenities and utilities because it is located in the center of the city. The city water supply provides water, the underground sewer and drainage system is located right next to the road, the site is surrounded by telecommunications lines, and NEA provides electrical service.

4.7 Climatic Study

The design of the building is heavily influenced by the climate. The climatological facts of the site determine the layout of the building, the size of its openings, its orientation, and its roof projections. With a comfortable range of temperatures, humidity levels, and sun radiation, the climatic condition is temperate sub-tropical with moderate temperature variations.



Source: <https://www.worldweatheronline.com>

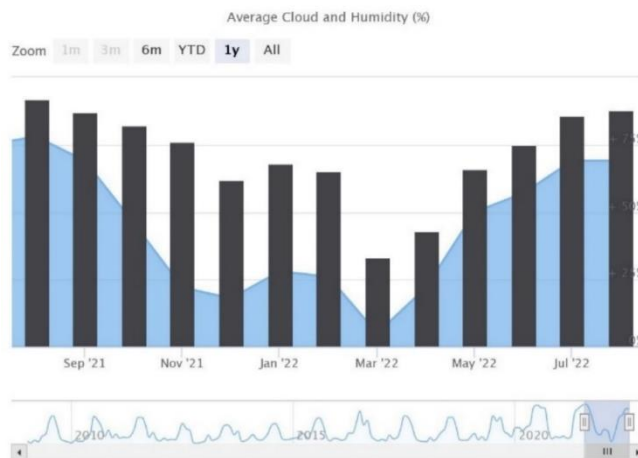
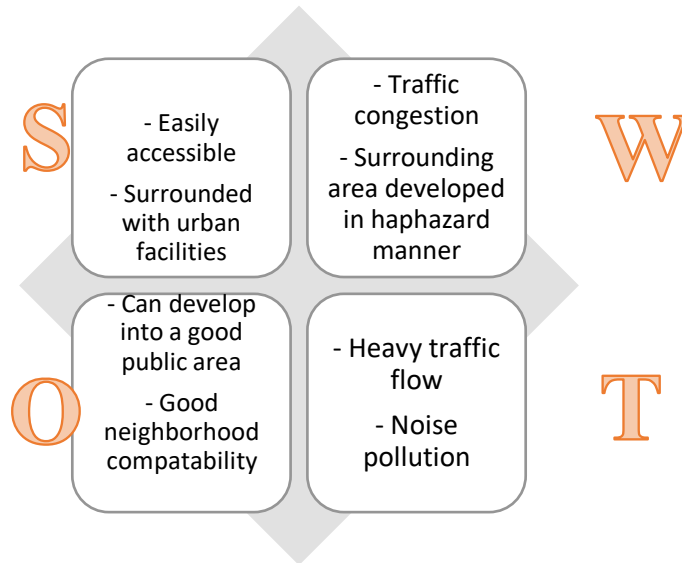


Figure 157: Climatic data of Thapathali

The climatic condition is moderate with annual mean temperature of around 25° C during summer and 11° C during winter. The humidity starts decreasing from January as dry season starts and reaches high (80-90%) during monsoon. The wind direction is predominately southwest throughout the year.

4.8 Swot Analysis



Strength:

- Easily accessible
- Surrounded by commercial and educational institutions
- Vibrant area
- Located in a prime space, road junction
- Easily visible from main road
- Well surrounded by all required urban facilities

Weakness:

- High traffic area
- Haphazard development of surrounding area

Opportunity:

- Can develop as a good public area for the surrounding
- Can develop as a landmark

Threat:

- Heavy flow of traffic
- Noise pollution

5. PROGRAM FORMULATION

The size of library depends on the community they serve. In order to find out areas required for different spaces; we have to know about the population of that community.

Since my library is located in Kathmandu, using the census data of 2011, we get the following report:

AGE GROUP	CHILDREN		TEENS	ADULT
	5-9	10-14	15-19	19-64
POPULATION Total: 15,62,283	1,37,162	1,65,679	2,02,0174	10,57,268

Total no. of people using library= 86.3% of 15,62,283
=13,48,250

Assuming only 10% of users, as library service for 13,48,250 people is not possible through one place.

Therefore, Total no. of users=1,34,825
~ 1,35,000 (factor of safety)

Total no. of collection= 1.75x1,35,000=2,36,250

Total no. of seats= (1.25x135000)/1000=168.5 ~ 200 seats (factor of safety)

Total no. of staffs= 55 (The American Library Association recommends that space for staff be calculated on the basis of "one staff member (full-time or equivalent) for each 2,500 people in the service area)

Table 6: Experience formula for library size

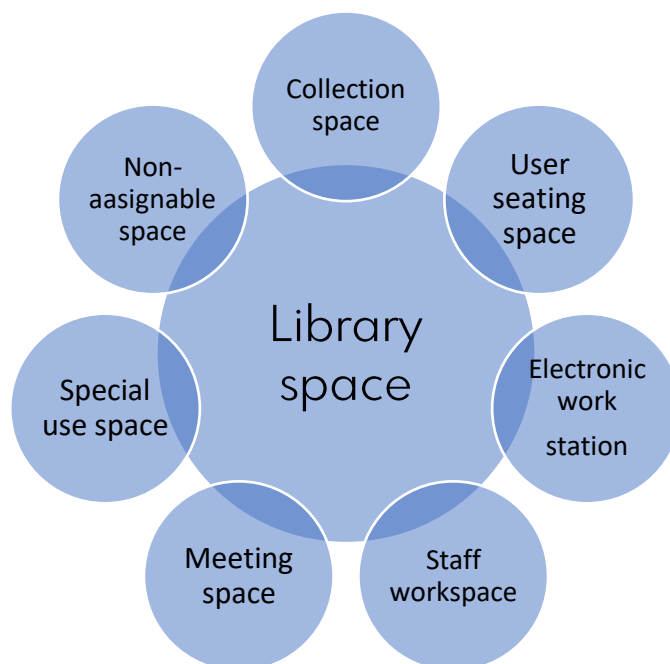
Population size	Book stock – volumes per capita	No. of seats per 1,000 population	Circulation – volumes per capita	Total sq ft per capita	Desirable, first floor, sq ft per capita
Under 10,000	3½-5	10	10	0.7-0.8	0.5-0.7
10,000-35,000	2½-3	5	9.5	0.8-0.65	0.4-0.45
35,000-100,000	2¼-2½	3	9	0.5-0.6	0.25-0.3
100,000-200,000	1¾-2	2	8	0.4-0.5	0.15-0.2
200,000-500,000	1¼-1½	1¼	7	0.35-0.4	0.1-0.125
500,000 and up	1-1¼	1	6.5	0.3	0.08-0.08

SOURCE: Joseph L. Wheeler and Herbert Goldhor, Practical Administration of Public Libraries (New York: Harper and Row, 1962) p. 554.

The broad types of public library space are:

- Collection space
- Reader seating space
- Staff work space
- Electronic work station
- Meeting space
- Special use space
- Non-assignable space

Source: Time saver standards for building types



Space for collection of books

S. N	TYPE OF COLLECTION	VOLUME OF BOOKS	NO. OF VOLUME PER SQ. FT	AREA IN SQ. FT	AREA IN SQ. M
1	Children's collection	7,000	8	875	81
2	General collection	110,000	10	11,000	1,022
3	Reference collection	105,250	10	10,525	975
4	Current periodicals	3,000	1.5	2000	185
5	Bound periodical	5,000	13	385	36
6	Non-print items	6,000	10	600	56
TOTAL:		2,36,250		25,385	2,355

Reading space

S. N	READING AREAS	NO. OF SEATS	PER PERSON (SQ. FT)	AREA IN SQ. FT	AREA IN SQ. M
1	General Reading	80	25	2,000	185
2	Reference	40	25	1,000	93
3	Periodicals	20	25	500	46
4	Study carrels	10	20	200	18
5	Children's section	20	20	400	37
6	Teen section	10	30	300	25
7	Lounge chairs	10	40	400	37
8	Disable section	10	40	400	37
TOTAL:		200			48

PROGRESSION OF CIVIC SPACE: LIBRARY WITH COWORKING SPACES

Other spaces

S. N	DESCRIPTION	NO.	CAPACITY	PER PERSON (SQ. M)	AREA IN SQ. M
A.	ADMINISTRATIVE SPACES				
1	Reception	1	-	10	10
3	Property counter	2	-	-	40
4	Catalogue area	3	-	3.25	9.7
6	Chief librarian	1	1	-	23
7	Deputy librarian	1	1	-	18.5
8	Assistant librarian	1	1	-	14
9	Technical section	1	-	-	100
10	Acquisition section	1	-	-	150
11	Binding section	1	-	-	15
12	Book storage	4	-	-	200
13	Meeting room	2	15	2.3	70
15	Pantry	3	-	-	42
16	Toilets				28
	TOTAL:				720
	STAFF AREAS				
1	Circulation counter	1	-	-	39
2	Break room	1	7	2.3	17
3	Single staff workstation	8	-	6	47.5
4	Loading dock	1	-	-	30
	TOTAL:				135
B.	MULTIPURPOSE HALL				
1	Foyer	1	50	0.5	25
2	Store	1	-	-	20
3	Hall	1	150	2	300
4.	Toilet				30
	TOTAL:				375
C.	E-LIBRARY				
1	Server	2	-	17	33
2	AV room	2	-	2.3	2.3
3	Patron access computer	10	-	4	37
	TOTAL:				75
D.	CAFÉ				
1	Dining area	1	85	1.3	110
3	Store	1	-	-	6.5
4	Counter	1	-	-	20
5	Toilets				15
	TOTAL:				150
E.	CHILDREN'S AREA- Specialized Functions				
1	Activity area	3	-	1.2	3.5
2	Children's storytelling/Program room	1	30	1.2	5.6
3	Four seat table-child sized	6	4	4.5	27
4	Picture book/bins	3	-	3.7	11
	TOTAL:				50
F.	COWORKING SPACES				
	Private workspace	8	1	9.3	75
		4	4	9.3	150

PROGRESSION OF CIVIC SPACE: LIBRARY WITH COWORKING SPACES

		2	2	9.3	37
2	Isolated workspace	-	35	7	245
3	Shared workspace	8	6	6.9	335
5	Break out space	1	60	9.2	556
6	Meeting room	3	10	2.3	70
7	Lounge area	10	4	4	160
	Toilets				45
	TOTAL:				1,673
G.	OTHER SPACES				
1	Newspaper racks	2	-	2.3	4.5
2	Stand-alone copier	1	-	6	6
3	Printer station	1	3	4.2	4.2
4	Paper rack	2	-	3.2	6.5
	Book drop	9	-	1.4	12.5
	Free standing book display	10	-	7.5	75
	Security gate	1	-	0.8	0.8
	TOTAL:				110
H.	SERVICES				
	HVAC	1	-	-	75
	Elec. And Plumbing	1	-	-	100
	Security and surveillance	1	-	-	37
	TOTAL:				212
I.	PARKING				
1	Car parking			180 (9'x20')	
2	Bike, scooter parking			37 (6'2"x4'9")	
3	Cycle parking			16 (5'9"x2'3")	
4	Disable parking			140 (12'x15'6")	
5	Transportation vehicle			300(30'x10')	
	GRAND TOTAL (Area without circulation)				5903
	Add 30% for circulation and wall				1770.9
	Built-up area				7673.9

BUILT UP AREA= 7,775 m² (approx.)

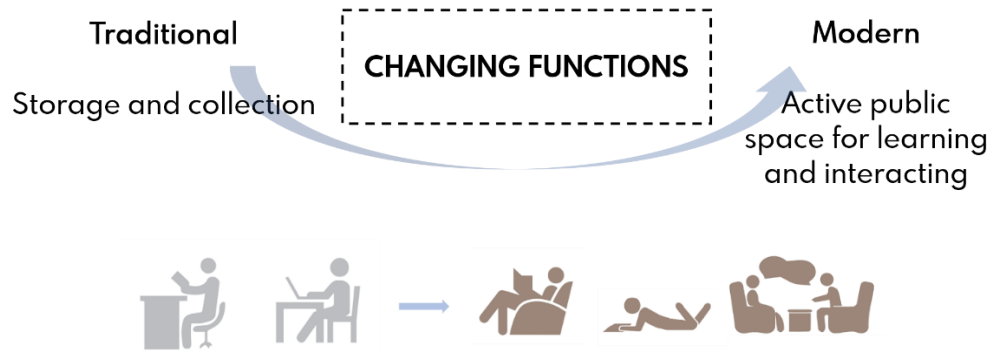
6. CONCEPT AND DESIGN DEVELOPMENT

6.1 Design Concept

LIBRARY AS AN ACTIVE CIVIC SPACE

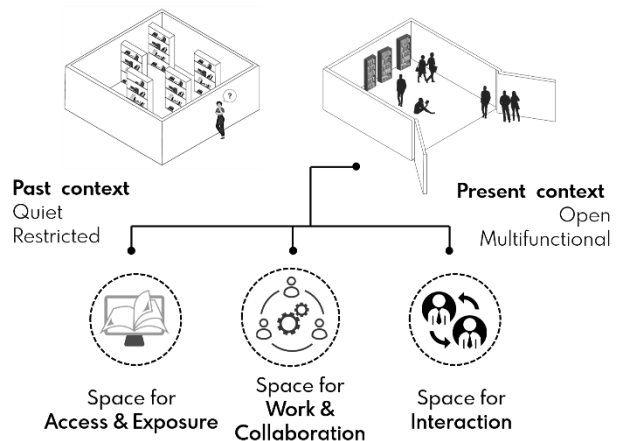
The fundamental goal is to design a space that promotes interaction, collaboration, and communication by establishing a pleasant atmosphere for learning; not limited to books but also through interaction between people.

Because information is so easily accessible because to technology, public libraries are losing value. The modern library must also grow into a place for social interaction based on learning and sharing activities. In today's society, a library building must define an architecturally powerful civic space that is committed to the users rather than the conventional approach that revolved solely around printed books. By including a hybrid stretch, the envisioned library seeks to bridge the gap between traditional and modern learning centers. As a result, this thesis favors combining libraries with coworking spaces to reinvent the library as a lively public space that meets people's needs.



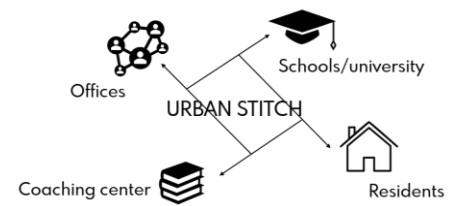
OPEN AND ACCESSIBLE

Transformation of libraries from simple collection houses to modern libraries include the enhancement of libraries as environments suitable for coworking and social learning. Traditionally, a library is a carrier of historical records and a place of cultural heritage, a building type with a particularly clear functional orientation. However, in response to the development of the times, libraries have embodied the spirit of openness of urban space, providing a wide variety of functional services based on learning and collaboration.



URBAN PLAZA

The chosen site is nestled between office, schools, coaching centers, residents. With this range of community context surrounding it, the new library is designed to attract people inside the site. A stretch of urban plaza has been proposed alongside the adjacent road sides, to provide accessible open space in the dense area. The plaza also connects the library with the community; by landscape, seats that invite people to enter and use the space.



In this case, Urban Plaza also serves as a buffer zone between the road and the built form, as well as promoting continuous visual access between the interior and outdoor environments.

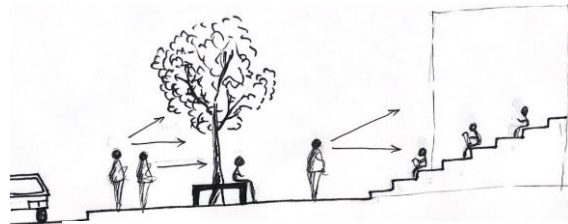
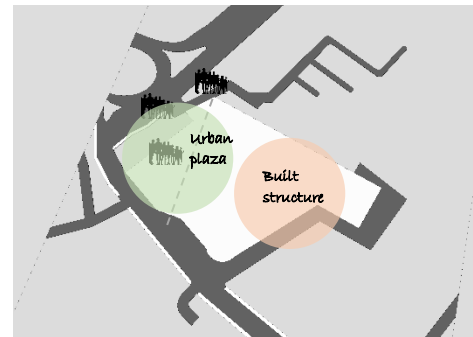
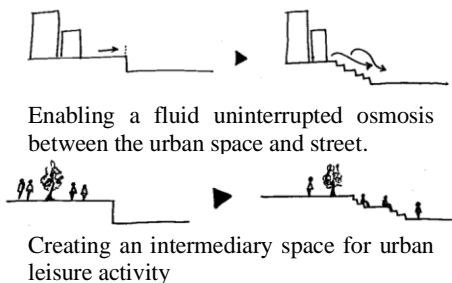


Figure 158: Plaza space



The plaza is a communal hub that responds to modern public space requirements. The stepped plaza features rich landscaping components to interact with as well as a range of seating options including food courts, interactive spaces, and leisure spaces. It is a platform for a wide range of community requirements that contributes to the creation of a collaborative environment.



COMMUNITY LIVING ROOM

When visitors enter the library, they will notice that the floor space, which was previously dominated by printed collections, has been transformed into a lively space with comfortable areas to relax, explore, and socialize. The library's living room accommodates a wide range of user preferences, providing areas to 'hang out,' drop in, plug in, login, meet up, read a magazine, listen to music, and buy a coffee. In the same space, users can engage in a variety of activities such as working, eating, conversing, and surfing. The living room serves as the heart of the library, encouraging contact and collaboration in order to foster a better community.

The central atrium is designed with a collaboration staircase which can be used by individuals for working/learning or as event seating. The atrium promotes interaction by

encouraging exploration with several internal views above and below thus connecting with spaces both horizontally and vertically.

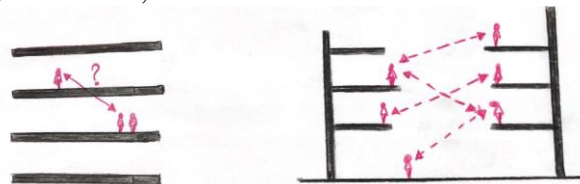
INTEGRATION OF NATURE



To break and add variety to the library spaces, nature has been integrated into the interior. The presence of greenery alleviates the mental fatigue we can experience when our focus is directed to a task for too long. This experience frequently occurs in office and learning spaces where workers find themselves glued to computer screens or paper work. Having that green space to occasionally glance at can help boost one’s workflow and productivity. Even the most isolated pocket of green space has real benefits for the mind. Increased social interaction and stress relief represent just a few of the real benefits that green spaces can provide.

REINTERPRETED LIBRARY

To re-activate the library, the project has expanded the meaning of the library to be more than a place for reading books, but to become ‘an active civic space’ for people. Various programs are integrated into the new library. They range from a co-working space, an exhibition space, a multipurpose hall, where the library becomes a place for the exchange of ideas, and it includes not only physical books as sources of knowledge and inspiration but also digital media, exhibition, etc.



Instead of traditional library which only served as collection of books this library will be more open which encourages visual connection between various functions and invites visitors to be inspired. The openness further encourages social interaction and exchange of information.

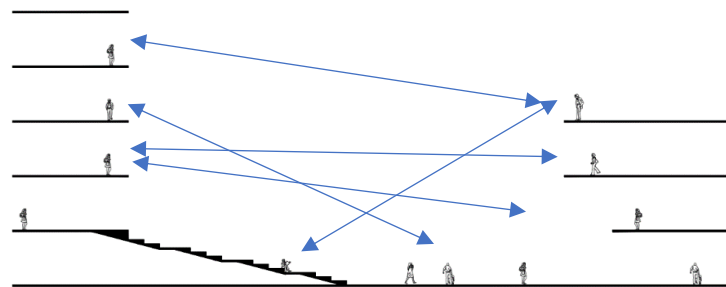


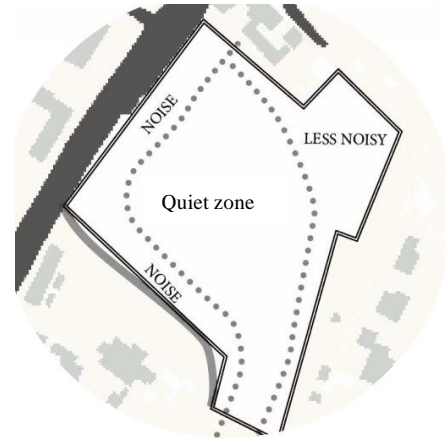
Figure 159: Atrium space

6.2 Zoning

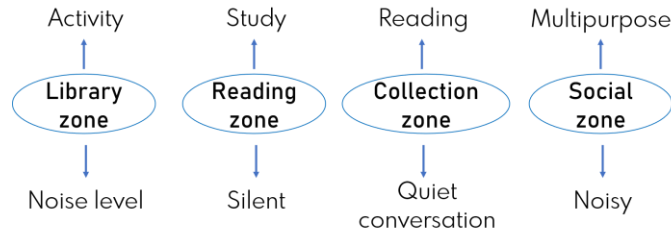
The library is zoned horizontally and vertically as per space utilization and sound intensity.

Horizontally, the whole site is divided into noisy, less noisy and quiet zone.

The library activities are placed on the far end of the site which is the least noisy side and more public or noisy activities which do not require quiet are placed towards the street. Public plaza is developed with various trees, bushes that further help to buffer sound from the street.



Vertically, zoning is done as public, private and semi-private, which also relates to noise levels.



Citizen services, a café, and a multipurpose hall are located on the ground floor. This ensures a dynamic place with synergy between the library's many activities, where all spaces are linked together. The café space will encourage people to enter the building from the plaza and discover all of the facilities the library has to offer, such as participating or enjoying an event, attending a reading group, checking their emails, browsing the new books, or having a quiet time with a coffee and a daily paper.



Hence, the entire ground floor of the site and building serves as a public zone that people of the community may easily access and can play a role in fostering a social connection with the site and building. The library is divided into three sections: The ground level is a public zone that functions as a Modern library with developing functions of a public library.

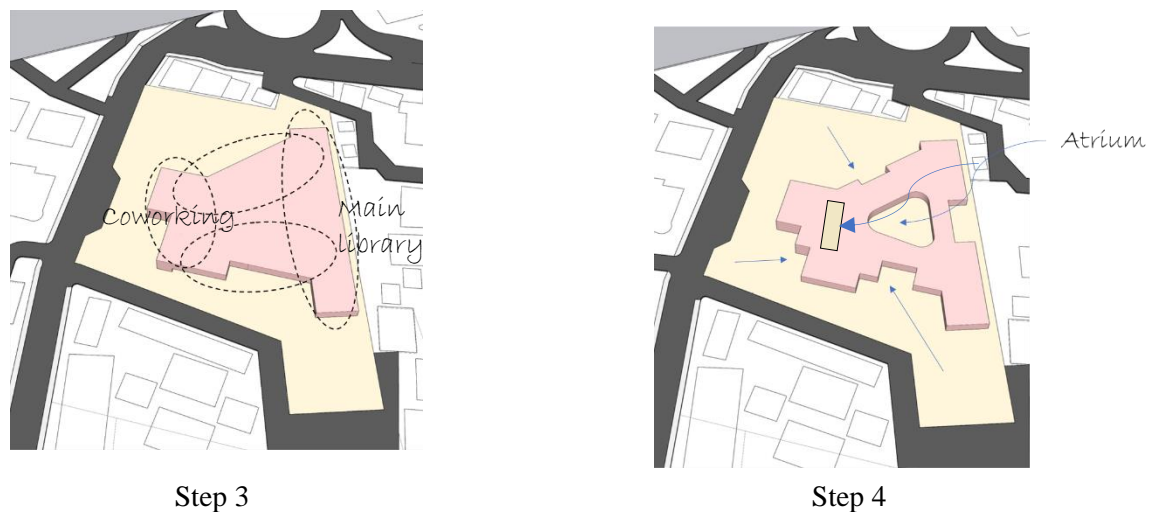
The first level is a Semi-Public zone that serves as a Hybrid Library, embracing the hybrid characteristics of a public library by housing both traditional print books and multimedia. The Upper Floors act as private zone which functions as a traditional library incorporating book stacks and reading areas along with coworking spaces.

6.3 Form Development

The form development was done considering various site constraints as well as functional aspects and zoning.



At first, the area for most public interaction was identified. Later, on the eastern side, a route was designed that would take residents directly to the main street from the site. Taking these elements into account, the position of the plaza to be designed was determined. The plaza would also serve as a buffer zone between the built form and the road, as well as a gathering spot for the neighborhood. The functional zoning was then completed by determining the least noisy to most noisy regions of the site and assigning library, coworking, and other services appropriately.



After zoning, atrium was designed for lighting and visual connection. This atrium aids in the creation of interconnected spaces that promote cross-learning. Similarly, offsets were done in order to encourage connectivity between the outdoor green spaces and indoor

surroundings. Outdoor learning spaces were also created in order to add variety to the library spaces.



Final form

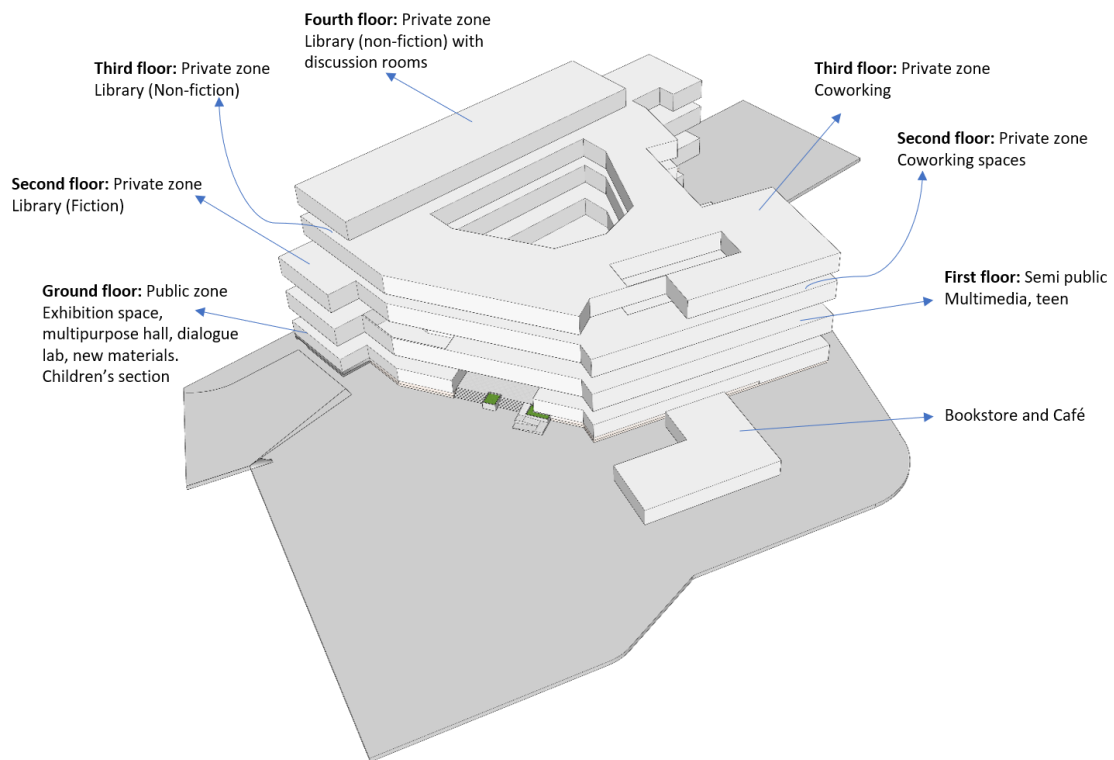


Figure 160: Zoning and program formulation in building block

The building is designed to have multiple balconies which is utilized by the people using coworking and library spaces. The balconies help in providing a connection between outdoor and indoor environment while also giving a space to relax and enjoy in outside environment.

6.4 Design Development

SITE PLAN

The site can be accessed from three directions: the main road and two secondary roads. Surface parking is available on the southern side through a secondary road. The same road is also used for basement entry and servicing. The northern secondary road is used for basement exit and pedestrian access. A shortcut connecting the northern secondary road to the main road would draw people into the site and allow them to appreciate the ambience inside the library plaza as well as relate to the activities taking place there. The western side of the site is boundary free, allowing people to easily access the building and plaza.

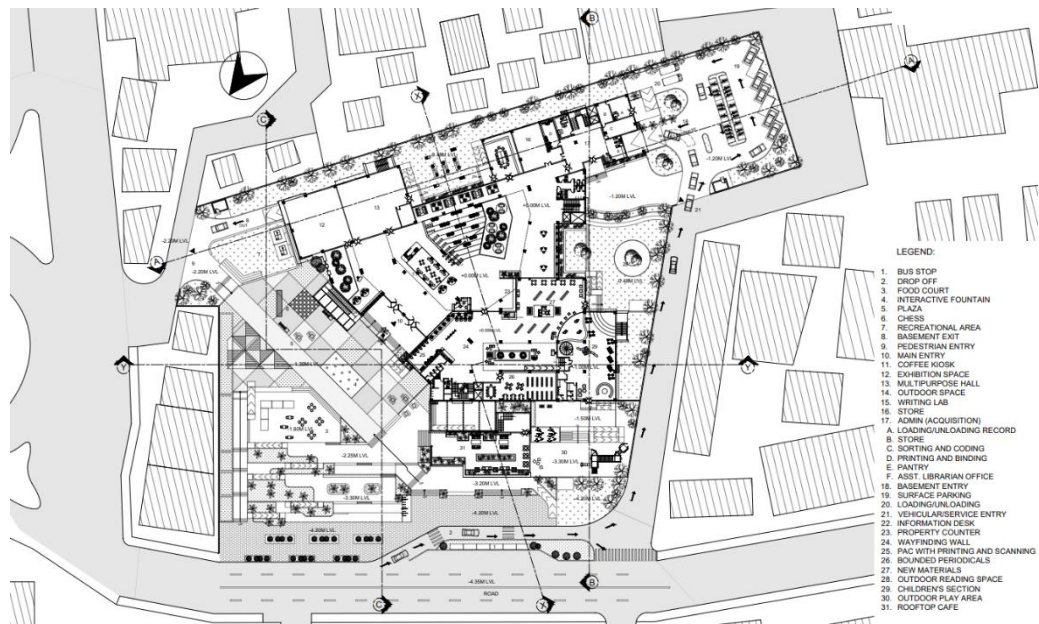


Figure 161: Masterplan



Figure 162: Bird's eye view

URBAN PLAZA

A generous plaza space is designed outside the library for the people of the community. The plaza serves as a gathering space where people can come together, socialize, and engage in various activities. It provides a place for library visitors to relax, read, study, or have discussions before or after using the library's resources. The incorporation of green spaces, trees, and gardens within the plaza design enhances the aesthetics and produces a peaceful ambience. Visitors to the library can appreciate outdoors, take a break from interior activities, and interact with the environment. The plaza provides ramp which promotes inclusivity by creating a welcoming space for people from all walks of life.



Figure 163: Plaza space from main road

Because a pathway connects the northern secondary road to the main road, various activities are placed along the pathway and in the plaza to draw visitors into the plaza and ultimately into the library even if they are just passing by.



Figure 164: Activities in plaza

The main entrance through the plaza leads into the ‘living room’ of the library where variety of activities can be seen happening. The library program is arranged as a public to private zone that ascends vertically, beginning with lively public programs on the bottom floor and progressing to quieter, focused study places on the top floors.

BASEMENT PLAN

Since the project is a public facility and the site is at one of the busiest intersections, the need for parking space cannot be overlooked. Basement parking is available for both two- and four-wheelers in addition to surface parking.

Users of the basement parking can access the plaza through an escalator or a semi-open area. A staircase and lift that leads into the building's main lobby is also present in the basement.

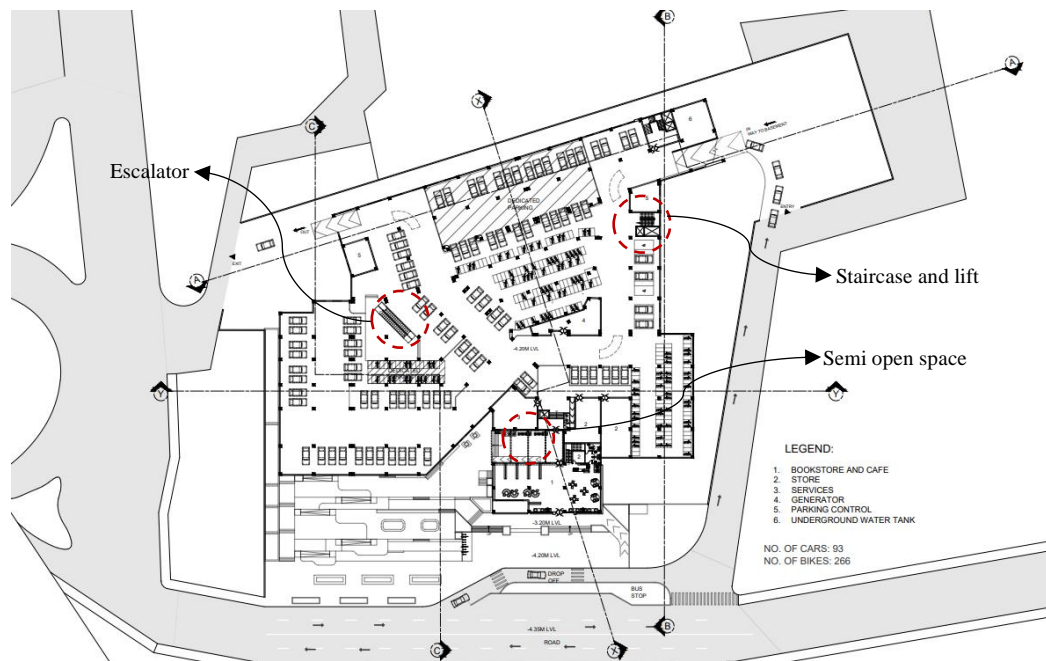


Figure 165: Basement plan



Figure 167: Basement exit through semi open space



Figure 166: Basement exit through escalator

For convenient access from the main road, a **bookstore and café** is located in the basement level. It is designed to draw people into the library and introduce the concept of enjoying a book while having a cup of coffee.



Figure 168: Bookstore and cafe

The plaza continues onto the bookstore and café's roof, maintaining its continuity while allowing for additional uses of the roof.



Figure 169: Connection between plaza and cafe roof

GROUND FLOOR PLAN

The ground floor consists of public activities that can be used by the public and users of both library as well as coworking spaces.

The ground floor consists of the following programs:

- **Living room:** The main atrium space is the living room which consists of variety of seating options and green plantings along with a café and stationery kiosks. A collaboration staircase is also present which is not only used as circulation or transit zone but also as a place for communication, discussion, informal meetings and events.



Figure 170: Main lobby

- **Exhibition space:** This space is provided for exhibition of various art or other materials for the people of the community
- **Multipurpose hall:** The hall is designed to hold variety of programs and meetings for admin staff and the users.
- **Writing lab:** A lab is given for those who enjoy language, literature, and creative writing. This lab serves as a gathering space where one can work individually or in groups.
- **New materials:** Some new materials are made readily available on the ground floor. Guardians can enjoy the new materials while their children are enjoying in their section. Users can also enjoy outdoor reading space which is accessible from this section.



Figure 171: Outdoor reading space

- **Children’s section:** Children section is designed with various play areas and interactive furniture along with study books and outdoor play area. This section is made to be 1m down than the surrounding floor level in order to create a mezzanine floor and provide visual connection from outside new material section to indoor children area. Children’s outdoor space is also designed which consists of various levels and play materials that help increase both physical as well as mental capacity of the children. The rooftop of café is also used as a viewing platform for the children playing.



Figure 172: Children's outdoor space

FIRST FLOOR PLAN

The staircase in the atrium leads to the lobby housing registration/membership office. Also, internal staircase in the library on the ground floor leads it to the first-floor library directly. This floor contains audio books, visual DVDs, e-books, public computers as well as teen section, children section, mind games room and fiction collection.

SECOND FLOOR PLAN

The second floor is divided into coworking space and library space. An internal staircase from the library in first floor can be used to access the second floor library which contains fiction collection. A number of terraces are also provided in library so that the patrons can use it for outdoor reading which also helps in maintaining outdoor-indoor connection. Also, to add variety in reading areas, reading pods are extended towards the atrium. This helps to break the monotony of library space and create an interesting study space.



Figure 173: Reading pods



Figure 175: Reading staircase



Figure 174: Library interior

We reach the coworking lobby through the staircase outside the library. Here, there are a variety of spaces for coworking, including hot desking, dedicated desks, meeting rooms, isolation pods, pantry, etc. Terraces are also available so that users can relax outside while enjoying the fresh air.



Figure 176: Coworking space

Both of these functions are connected in a breakout space containing various games and lounge seating along with coffee kiosk. Both the users of library and coworking can get connected in this space and relieve their fatigue from working and studying. This can lead to increased productivity and better outcomes for projects or studying.



Figure 177: Breakout space

UPPER FLOOR PLANS

The upper floor consists of more traditional library containing book collection and reading areas. Coworking spaces are present on the second and third level while library function extends to fourth floor. Coworking spaces and library spaces each have their own environment with green spaces in order to increase productivity and concentration. Mezzanine floor is also designed in library area in order to increase visual connection between different areas.

6.4.1 Fire Escape

A pair of external fire escape stairs are provided on the two opposite faces of the building along with internal staircase. The direction to the emergency exits is direct hence, helps to minimize chaos during emergency.

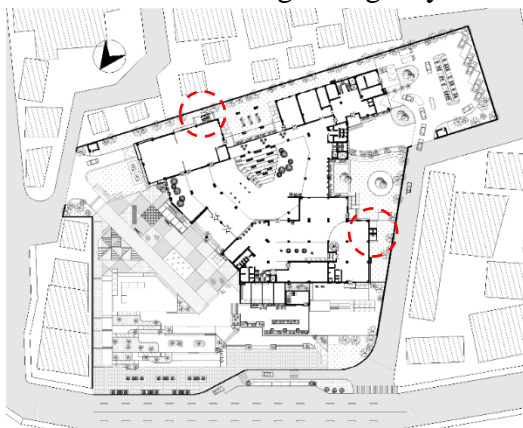


Figure 178: Masterplan showing fire exists



Figure 179: Fire escape stairs

6.4.2 Light and ventilation

In order to maintain natural ventilation and provide natural light in the interior atrium is designed. Two atriums are provided to allow light in the interior. The atrium walls have operable windows so that warm air may escape and keep the interior at required temperature. Warm air is pushed from the below by the fresh cool air which enters from the openings at the lower levels. This helps to minimize the amount of energy needed by the mechanical ventilation.

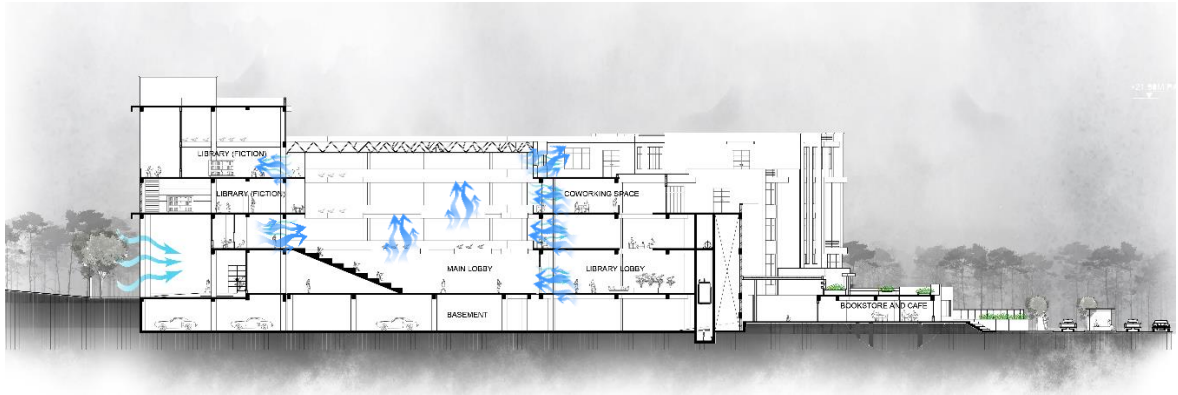


Figure 180: Ventilation through atrium

6.5 Physical model



Bird's eye view



Front view



Plaza space



Secondary entry



Back view



Café entrance and children's play area



South-west view (showing outdoor study space and surface parking)

Figure 181: Physical model

6.6 Structure and materials

6.6.1 Structure

RCC frame structure is used throughout the building because of the amount of live load especially the load of books and resources. The whole load is supported on beam and slab. The load then is transferred through columns to footing. Column size of 600mm x 600mm is used and expansion joint of 150mm is provided after span of 43-45m. Brick masonry and glass is used as partitions.

6.6.2 Materials

Reinforced cement concrete and bricks were used as building materials. The traditional material, brick, was combined with modern materials, concrete and glass. The usage of brick was done to give it an institutional character while also ensuring that the building blends in with the neighboring structures. The building's façade is made up of exposed polished concrete and exposed brick components. Brick jalis are also used. Double glazing glass windows are used to reduce noise levels in the inside. For atrium, steel structures are used which rest on concrete columns and beams.

6.7 Services

Building services is one of the important portions of the design, it comprises of services that are used in day-to-day life as well as services used for emergency purpose.

The proposed services are as follows:

- Water Supply
- Sanitary

1. Water supply



The size of water tank is calculated by water demand calculation.

Calculation of water demand (liter/capita/day):

1. Admin section
 No. of users: 55
 Consumption: $55 \times 45 \text{ liters/day} = 2,475 \text{ liters/day}$
2. Bookstore and café
 No. of users: 85
 Consumption: $85 \times 50 \text{ liters/day} = 4,250 \text{ liters/day}$
3. Coworking spaces
 No. of users: 105

Consumption: 105×45 liters/day= 4,725 liters/day

4. Library

No. of users: 565

Consumption: 565×20 liters/day= 11,300 liters/day

Table 7: Calculation of water demand

FUNCTION	NO. OF USERS	LPCD	TOTAL
Admin	55	45	2,475
Bookstore and cafe	85	50	4,250
Coworking spaces	105	45	4,725
Library	565	20	11,300
Total	810		22,750

Total amount of water required/day: $22,750$ liters/day= $22.75 \text{ m}^3 \times 3$ (safety factor)
= 68.25 m^3

Fire demand= 50,000 liters (NBC)= 50 m^3

Total underground tank= 118.25 m^3

Water tank size= 7m x 6m x 3m

Calculation of overhead tank

Calculation of overhead tank= 40% of daily consumption (3 times pumping a day)
=40% of 22.75 m^3 = 9.1 m^3 ~ 9100 liters

So, one overhead water tank of diameter 2m and height 3.2m is used having capacity of 10,000 litres.

2. Sanitary

Table 8: Septic tank calculation

Primary users		Secondary users	
Admin	55	Bookstore and café	85
Library	300	Exhibition space	100
Coworking	105	Multipurpose hall	150
Total	460	Writing lab	14
		Total	350
		20% of total	70

Total no. of users= $460+70$ = 530

Required volume of septic tank= No. of users x 3 cu.ft.

= 530×3 cu.ft= 1,590 cu.ft = 45 cu.m

Size of septic tank= l x b x h

= $3b \times b \times 3$ (taking height h=3m)

B=2.2m , L= $3b$ = 6.6m, H=3m

Size= 6.6m x 2.2m x 3m

Soak pit from standard= 4 x sp.6 (Sp.6 Diameter= 5m, Depth= 2.75m)

7. CONCLUSION

By making books and other media available to the community it serves, the contemporary library plays a significant role as an institution promoting the freedom of information. However, in the information age, with rapid growth of internet and technology, books have come under threat. Reimagining libraries and transforming them from "collection to connection" reflects the modern library's shifting function and recognizes its new responsibility to act as a hub for social interaction and everyday living.

The purpose of this project, "Progression of civic space: Libraries with coworking spaces," is to direct individuals and society toward a better, more active, and more relevant library for modern society.

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ANNEX-A

QUESTIONNAIRE

Questionnaire

For users:

1. How long have you been visiting the library? (Years or months)
2. How often do you visit the library?
3. -daily, once a week, first time, once a month, 2-3 times a week, 2-3 times a month, others
4. Primary purpose of visit?
5. What do you like most about the building?
6. What do you dislike or what could be improved?
7. Do you usually come alone?
8. Do you come with someone? Who? For any particular reason?
9. Is it easy to find books? How often do you find books without asking librarians or using computers?
10. Do you like how books are arranged?
11. What does this library mean to you?
12. Anything new to the services or design that you would want to add to the new library?
13. Are there any spaces in the library that you avoid? [If yes] Which spaces and why do you avoid them?
14. Do you like the physical layout of the library?
15. Do you think the current functions in terms of:
16. Do layout, lighting, and aesthetics work? If not, how can it be improved?
17. What features should be included in our new library that would improve your ability to study and use resources?
18. What features should be included in our new library that would improve your ability to work on projects?
19. What types of furniture would work well for learning and working with other students?
20. What type of signage would allow you to find library resources yourself?
21. What features should be included in a space designed for reading printed materials?
22. What features should be included in a space designed for reading on an electronic device?
23. Do the colors of walls and furnishings in a library matter to you? Why?
24. What is currently your favorite learning activity in the library?
25. What ideas do you have that could make the activity even more interesting?

About themselves:

1. Age?
2. Occupation?
3. Going to college?
4. Live where?
5. Do you have a library card? How long ago?

For librarians:

1. What are the current functions or services being provided? What sort of collections?
2. About how many collections does this library hold? And how are they arranged?
3. How many visitors or users do you have in a day?
4. Has the number of visitors increased/decreased?
5. Do you think the current functions in terms of:
6. Do layout, lighting, and aesthetics work? If not, how can it be improved?
7. How do people find books here? Do people ask for help to find books?
8. Do you think people only come here to read books or have you noticed other activities that people are involved in? Is there variety in the types of seating?
9. What do you do to ensure that your patrons have access to new and relevant reading materials?
10. Is there enough room for the products and services the library offers?
11. In order to accommodate collection growth, have seats been exchanged for stacks?

12. Is the atmosphere of the library pleasing for customers and staff?
 13. Has the emphasis on the products and services offered by the library changed?
 14. How would you explain the importance of libraries in the present context?
 15. Where should a library be located, according to you?
 16. How is technology being used in the library?
 17. Services- entry points, parking, storage, old books, repair, checking before unloading, bar code?
 18. Are there problems with the physical condition of the building (outdated systems, inflexible floor plans, ADA problems, difficulty in installing technology)?
 19. Has the library investigated adjacent buildings that might be acquired in order to add square footage to the existing library?
 20. Are windows treated or shaded to prevent the hot and damaging rays of the sun from penetrating the interiors?
- ANY FUTURE PLANS?

An online survey was carried out as a primary study to understand the present use of public library in Nepal and explore ideas on how to make them better.

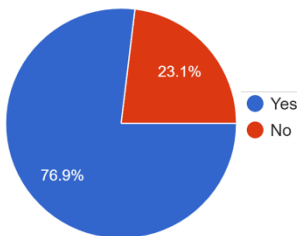


Figure 182: Are public libraries still relevant?

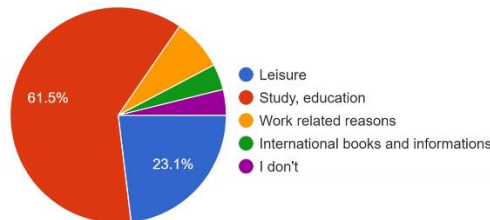


Figure 187: Primary use of library and its services

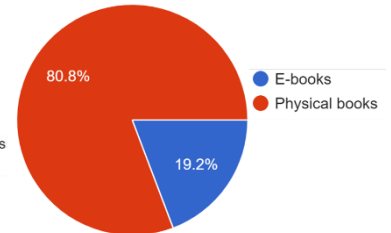


Figure 186: Do you prefer e-books or physical books?

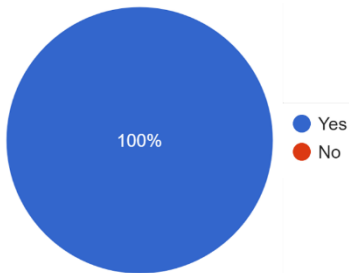


Figure 184: Do you think it is necessary to have a place to work where you can meet other people who share same ideas with you?

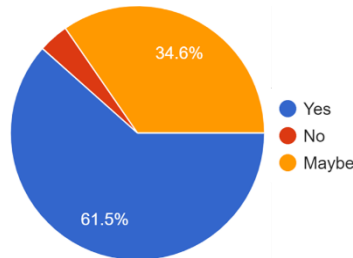


Figure 185: Do people think it is better to have public libraries with coworking spaces?

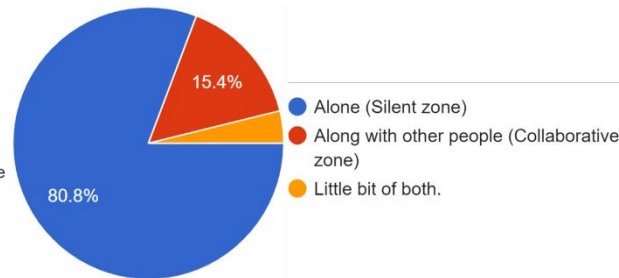


Figure 183: How would you like to read in a library?

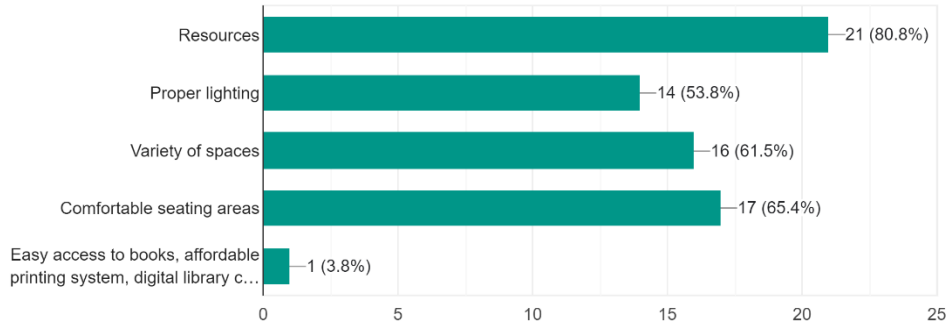


Figure 188: What are the most important attributes of a library?

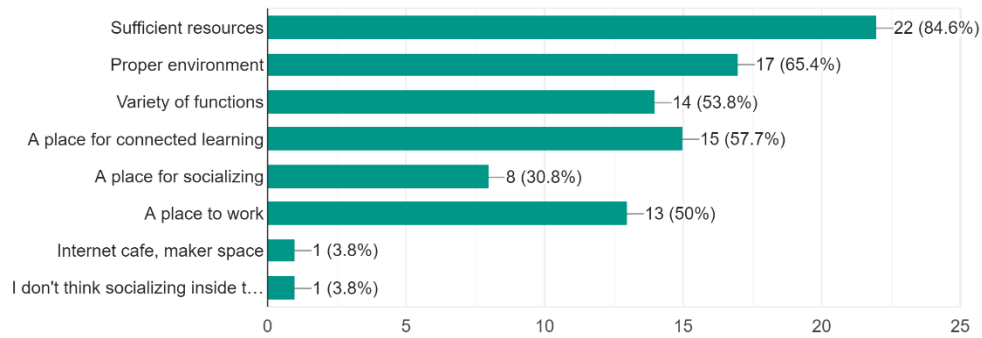


Figure 189: What do you think are some of the issues of public libraries?

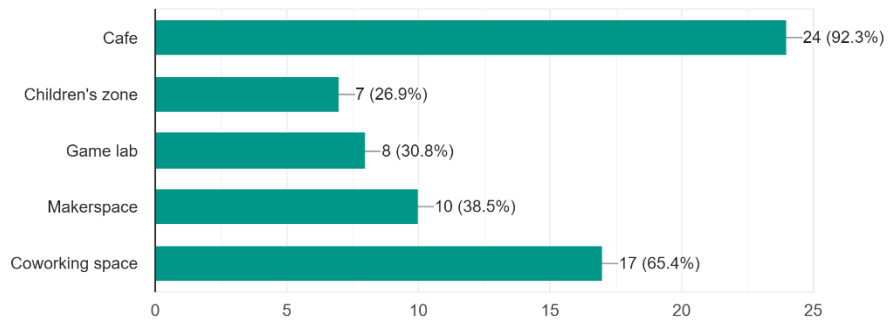
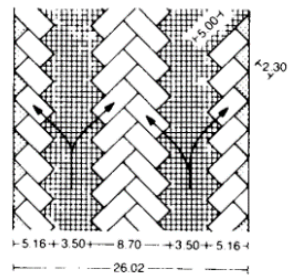


Figure 190: What other facilities would you like in a public library?

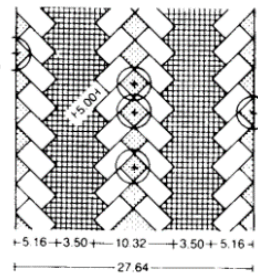
ANNEX-B

ANTHROPOMETRIC DATA

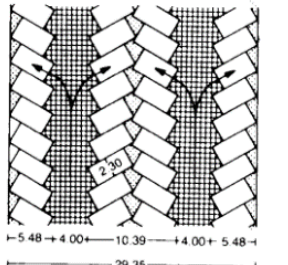
Parking standards



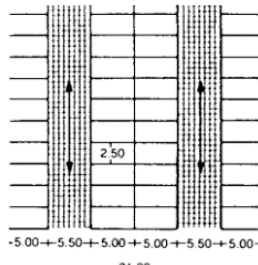
7 45°-angled parking, one-way traffic only



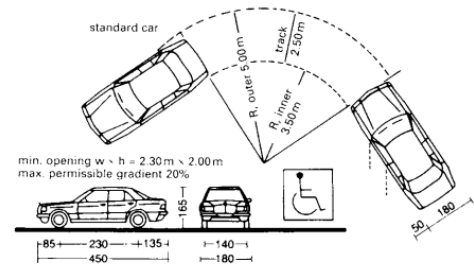
8 Parking for one-way traffic (with spaces for plants)



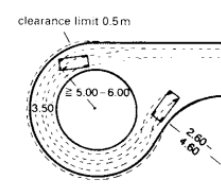
9 60° angled parking, one-way traffic



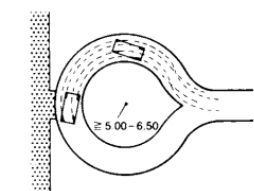
10 90° parking, 5.5 m wide road. Parking spaces 2.5 m wide



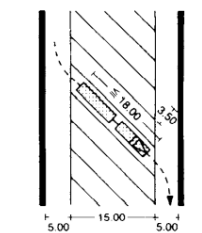
1 Standard car



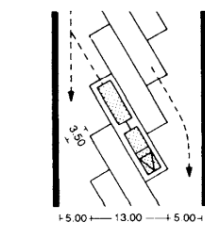
2 Car turning circle



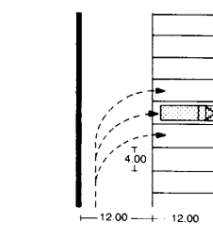
3 Car turning circle radius for an entrance drive >= 5-6.50m



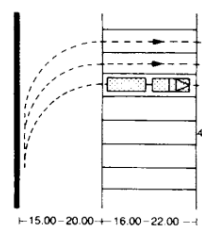
1 45° parking, truck with trailer



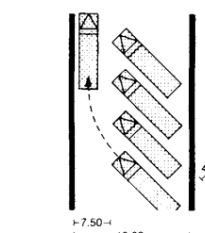
2 30° parking, truck with trailer



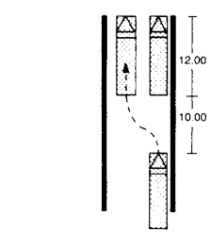
2 90° parking, a single truck



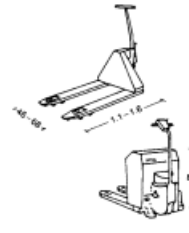
4 90° parking, truck with trailer



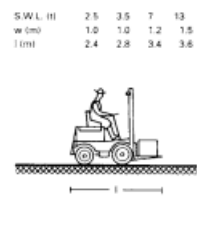
5 Parking at less than 45°



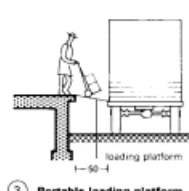
6 Space loss, parking parallel to kerb



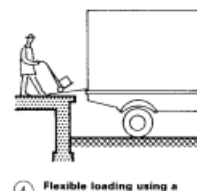
1 Pallet truck



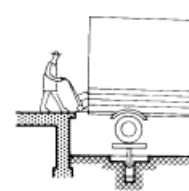
2 Forklift truck



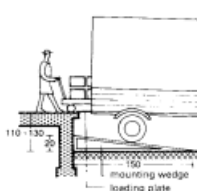
3 Portable loading platform



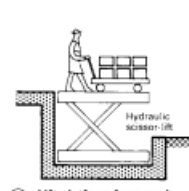
4 Flexible loading using a steel plate



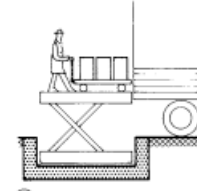
5 Close to the rear axle, using a jacking system



6 Permanent or portable dock leveller

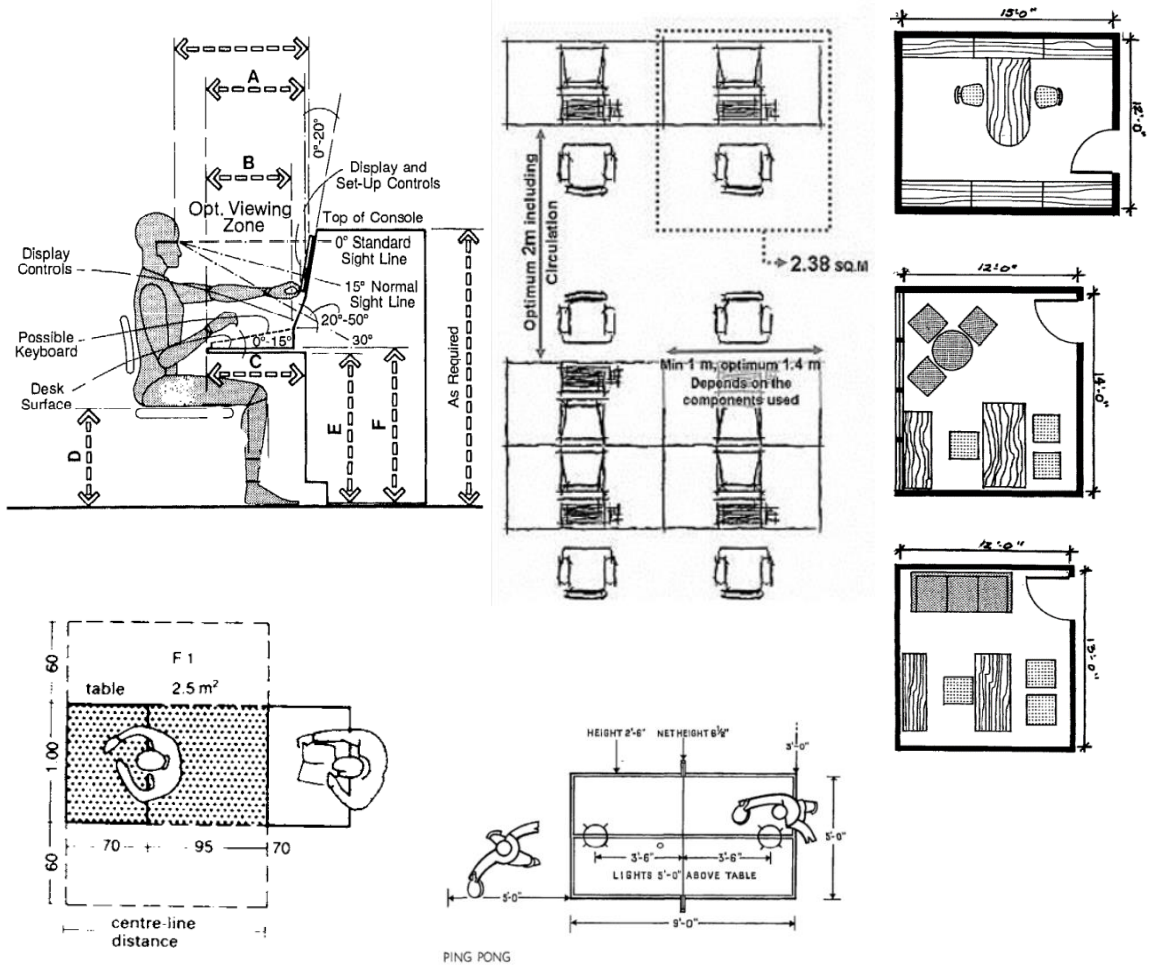


7 Lift platform from yard level to dock or vice-versa

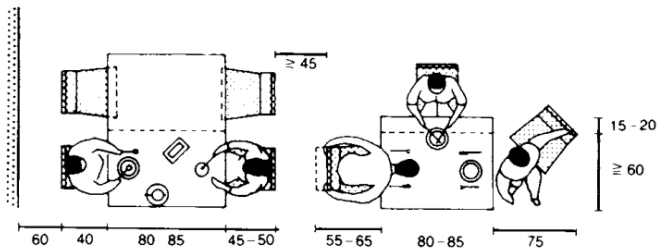


8 Dock to truck

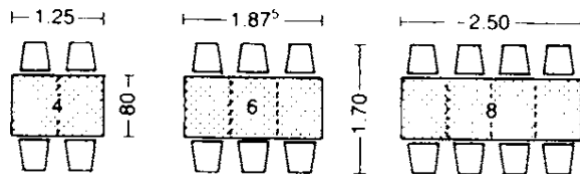
Office Standards



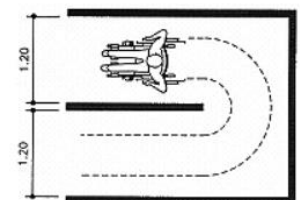
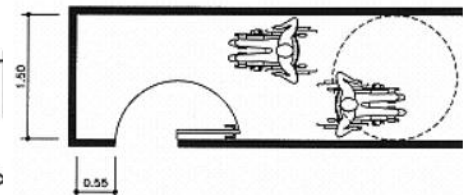
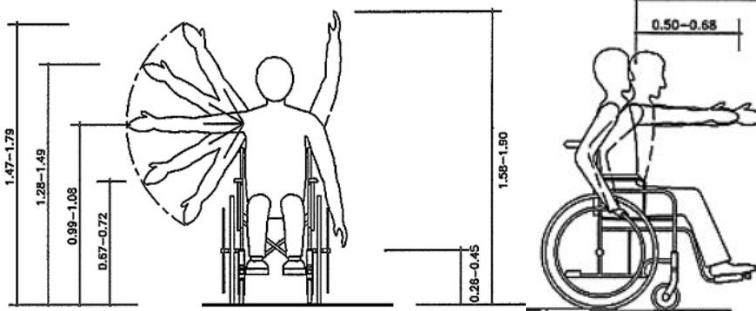
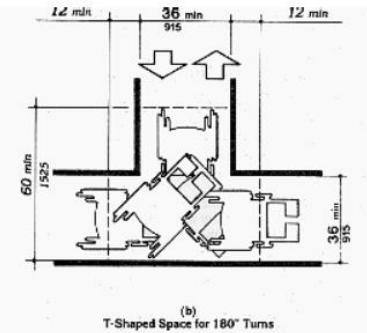
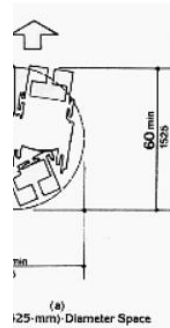
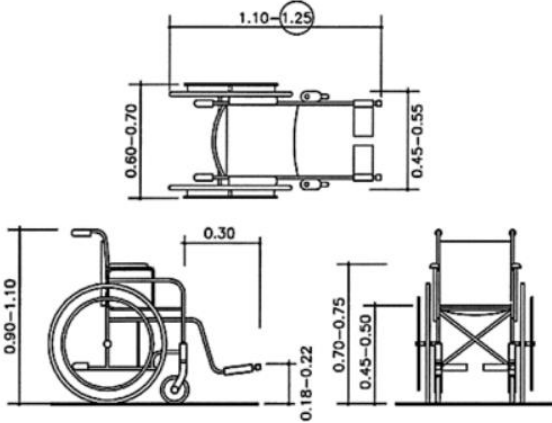
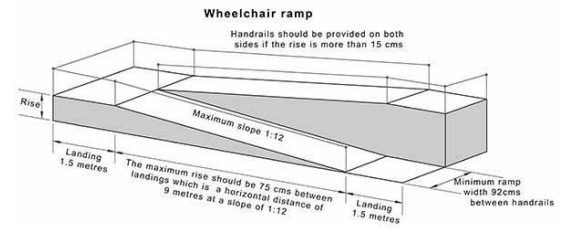
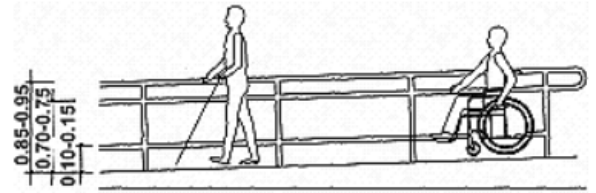
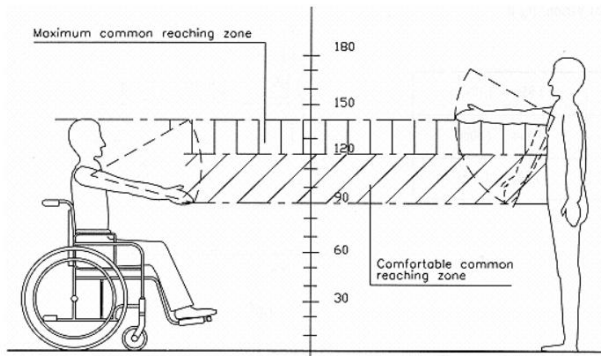
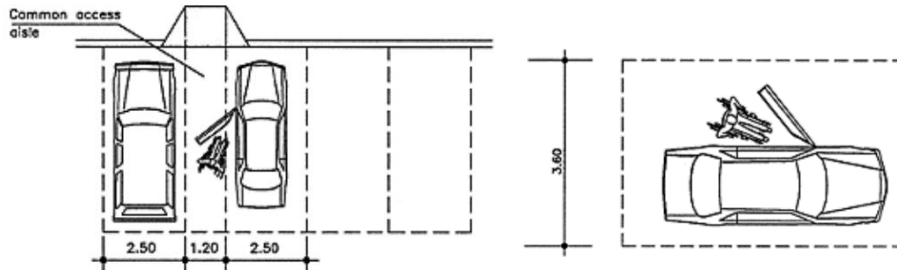
① Floor area for an individual workstation



Café standards



Universal design access



ANNEX-C

ARCHITECTURAL DRAWINGS
