PECULIARITIES OF FUNCTIONAL AND PLANNING ORGANISATION OF UNIVERSITY LIBRARIES

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ABSTRACT

A university library is a space in which complex organisational processes take place, various functional areas are intertwined and separate movement schedules coexist. If the library's physical space does not provide appropriate conditions for individual and group work, quick and free access to information resources or the possibility of using computers and copying equipment, such a library will be infrequently visited. All of this determines the specifics of the library's internal space organisation. To ascertain this, one needs to rethink its planning structure from the standpoint of possible functional development. That is why the essay's objective is to highlight the main functional and planning elements of a modern library, the presence or absence of which directly affects the quality of its functioning.

Keywords: university library, functional planning organisation, reading room, book depository, service room

INTRODUCTION

The history and architecture of university libraries have developed over many decades, even centuries. Their most distinguishing feature is a disproportionate organisation of space, with one large reading room, while other internal premises are usually dark, cramped and do not meet the modern requirements of the time or user needs. Such libraries are characterised, among other things, by unorganised infrastructure, outdated equipment, inefficient use of space, crowded book racks, inconvenient workrooms, unorganised planning and unsuccessfully designed service areas (Samotyj & Voronkova, 2014).

At the turn of the 20th and 21st centuries, dramatic changes in the awareness of the role and importance of a library as an institution took place. Whereas earlier, the library reflected a traditional concept of a repository, and its internal spaces were mainly intended for the accumulation, processing and storage of printed books. Today, the university library is more than just the centre of student life; it is open and accessible to the public at large. This is why new functions and spaces such as exhibition galleries, cafés, museums and lecture halls have emerged within the structure of the university library. Thus, its architecture becomes open, both conceptually and physically. This allows the library to be transparent in terms of its goals and functions (Wysokińska--Gąsior, Ed., 1995).

Constant technological development inevitably changes the library space. Library buildings of the 21st century adapt and improve functional planning organisation in accordance with new criteria in architecture and design,

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actively introducing information technologies into their activities. In this way, the modern library space reflects a user-centred design product that supports social and educational models of learning and teaching and makes a positive contribution to the life of the city through its new iconic architecture (Nur Şanlı & Sirel, 2022).

The idea of open and accessible space in the library dates back to the 1960s. At that time, librarians first proposed to organising the functional and planning structure of the library as a 'one-room library'. The approach implies that all library units are housed in the same room, separated from each other by furniture and book racks only. In addition, with such planning, three main areas can be distinguished: the core of the library (subscription, reading rooms, adult and children's departments grouped around one department), administrative premises, and premises for cultural and educational events (Svobodová, 2012; Svobodová, 2014).

An interesting approach to zoning the library space was used by French specialists: they suggested using the concept of a 'vaguely divided space' rather than the term 'boundary' of the zone. They noted that in order for different groups of readers to coexist side by side, without interfering with each other, and to outline the content of the library space, it is necessary that the building's planning structure is dominated by open spaces. In other words, the layout should contribute to the creation of different reading areas without establishing clear boundaries between them (Balashova, Tyshchenko & Vaisiev, 2004).

Today, the trends in internal planning of the library space focus on flexible interior options based on the use of modular structures with a minimum number of load-bearing walls. This provides the best conditions for modelling the space to perform the main functions of the library and to develop some new ones (Voronkova & Proskuryakov, 2020).

FINDINGS AND DISCUSSION

The analysis of international experience in the design and construction of library buildings allowed to identify two main functional blocks: the socio-cultural block and the library block.

The **socio-cultural block** (socioblock) is a free access area for library visitors to rooms and services designed for socio-cultural use. An important feature of the functional structure of modern university libraries is the presence of a social block, with additional units to serve regular users and temporary visitors. The basis of these units is the premises and individual structural elements, whose functioning is classified by the type of service provision. The premises are divided into two groups: commercial and non-commercial (Fig. 1).

To provide commercial services in the structure of the library's social block, areas are allocated for the functions of food catering (café, buffet, restaurant), commerce (bookshop, stationery shop, souvenir shop), banking services (bank branches, cash machines, bank terminals), and office facilities.

Non-commercial services in the structure of the library's social block are offered by the reception desk, subscription desk, wardrobe, information boxes, electronic catalogue, book return point, exhibition, museum, conference room, recreation area and round-the-clock operations areas.

To speed up the registration process of new users and to ensure timely receipt of pre-ordered books by regular users, a place is allocated in the library structure for the *registration point* and *book distribution point*. In small libraries, the registration and lending of books are carried out behind a common counter; large libraries may separate those two processes. In modern libraries (provided that the library is located in a separate building), the reception and subscription are placed on the ground floor, near the entrance to the library, providing a vertical connection to the main book depository. It is also equipped with shelves for the ordered items.

The *wardrobe* is usually placed directly at the entrance to the library. Sometimes, the wardrobe can be placed on the underground level in the library (if the library is located in a separate building) or moved outside the library, for example, in the corridor of the educational building. Recently, the wardrobe has acquired the features of self-service: fixed hangers and maintenance personnel have been replaced by individual lockers.
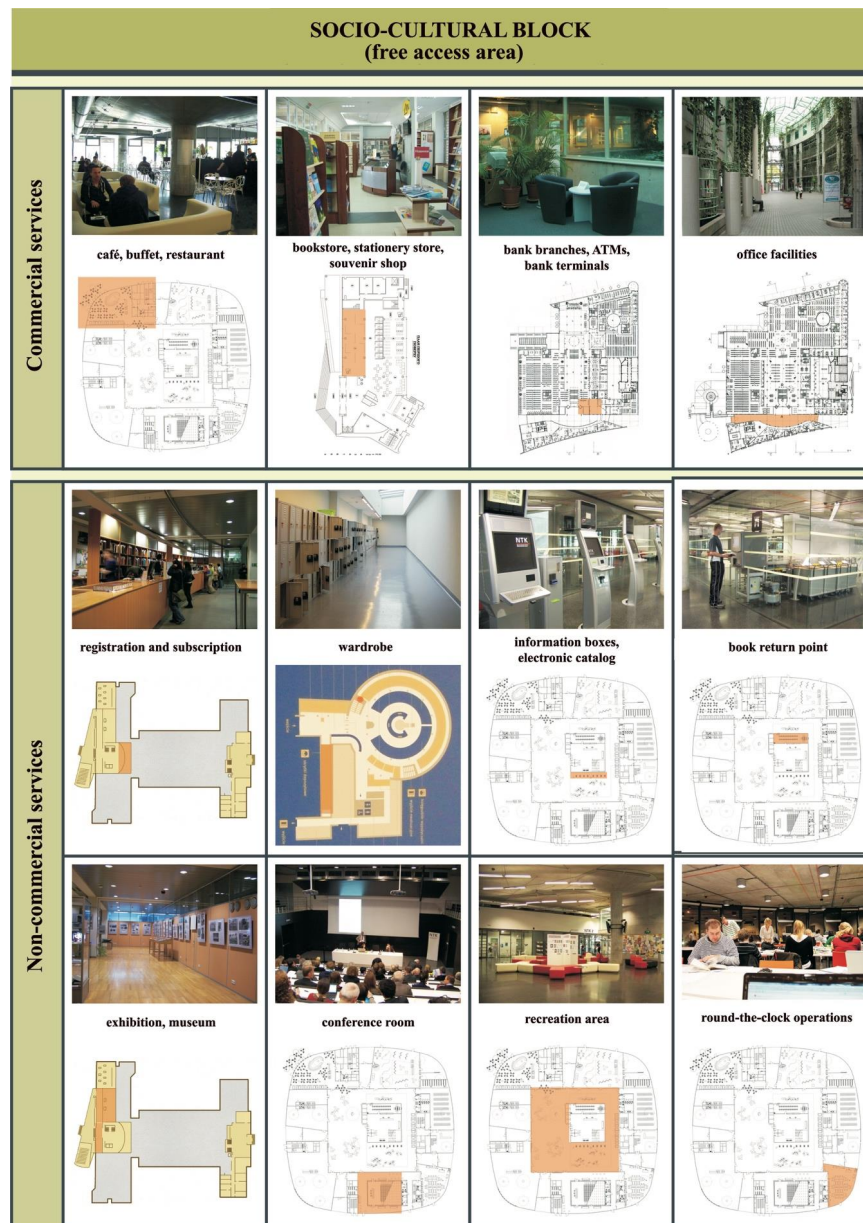
Fig. 1. Functional and planning elements of the socio-cultural block

Source: own work.

Information boxes and an electronic catalogue are installed in the library lobby (if the library is located in a separate building) or at the entrance to the library (within the library or outside, such as in the corridor of the educational building) for visitors to receive information about the library's activities or for quick access to the electronic catalogue.

The *book return point* is designed to receive user-processed literature received on subscription terms. The process of returning books can occur in different ways: assisted by the library employee, who accepts the returned items, or assistance-free, with no need to contact the library staff.

The *exhibition* and the *museum* perform the function of exhibiting works of fine art, equipment, new arrivals, bestsellers, rare editions, etc. Mobile stands, prefabricated demountable structures or cornices are used for exhibition displays. In small libraries, exhibitions can be set up in lobbies, on the walls of staircases, in the subscription room, or in the book distribution area. In large libraries located in separate buildings, a dedicated room for the exhibitions can be allocated (some libraries have specific rooms for exhibitions and museums), with an area ranging from 100 m^2 to 300 m^2. The main requirements for exhibition halls and museums include ensuring proper orientation with respect to horizon. Windows should face northwards to provide natural lighting and protect the exhibits from excessive insolation (Balashova et al., 2004).

The conference room. The minimum area of the lecture hall should be at least 50–60 m^2; for cultural and entertainment events, the area of the hall should be at least 200 m^2. The library area used for mass events must meet sanitary and hygienic requirements and have a separate entrance, lobby and toilets; a café or buffet can be located nearby.

The *recreation area* is allocated to provide refreshments and leisure activities for library visitors and users.

The *round-the-clock operations areas* are designed to provide access to library services at night time. The entrance to the premises is available from the side street (at night), as well as from inside of the library (during the day).

Studies of the range of services provided by the university library show that the availability of various functions of library premises has a positive effect on the psycho-emotional state of users. It helps to reduce the psychological load that comes from a long stay in a monotonous information space (especially when the types of activities and the nature of the environment do not change for a long time). Moreover, it increases library attendance, among other things.

That is why it is not the number of rooms and their name that is important, but – above all – the functional fullness, the idea of what should happen in them. The same space can perform different functions at different times, that is, it can be multifunctional. Therefore, it is important to determine for which activities it is intended and how many people will use it at the same time (Langie, Smiechowski, & Walczyna, 2012).

A vivid example of a well-thought-out functional and planned organisation of the social block in the structure of the library building is the National Technical Library in Prague. It is located in an open area surrounded by two universities, making students make a significant share of its visitors. The library has a conference hall, an exhibition hall, a cafeteria with 150 seats, a bookstore, a wardrobe and a self-service book return point. All these rooms are grouped around a huge hall, which serves as a meeting place not only for library users, but also for the general public. In addition, at the same level, there is a room for nighttime study that has a separate entrance from the side street (National Technical Library, 2009).

The **library block** (biblioblock) is an area of limited access to library premises and services. Access for users to the library block is possible only with a library card, entry is through a security gate, which is appropriately equipped. Access for personnel is ensured in the same way, subject to the availability of IDs (plastic cards).

Analysis of the floor plan of several libraries highlighted the main functional elements of the library space: a book distribution, a subscription area, a catalogue (card and electronic), a reading room, a book depository and administrative/operations premises. (Fig. 2).

The book distribution area is a point of handing out pre-ordered book items to be used in the reading room or in other rooms of the library.

A *subscription area* is a point for handing out pre-ordered book items to be used outside the library. Since there is a risk of increased noise during the most crowded periods, it is advisable to arrange it separately from the reading room. For ease of use, the subscription area must be placed directly at the entrance to the library or near the main communication routes (lifts, stairs, ramps).

A *card catalogue* is a way of registering existing library stock using bibliographic cards that are fixed and stored in the drawers of catalogue cabinets. The traditional card catalogue is typically located in

separate rooms, near the book distribution point and the reading room. In libraries with decentralised book distribution and a decentralised book depository, there is a need to arrange a dedicated card catalogue in each library section.

The *electronic catalogue* is a form of registration of the existing library collection in electronic form, placed in the library's virtual environment. To set up electronic catalogue, you do not need to allocate separate premises – it would be enough to equip a certain number of automated workstations in the most popular areas of the library.
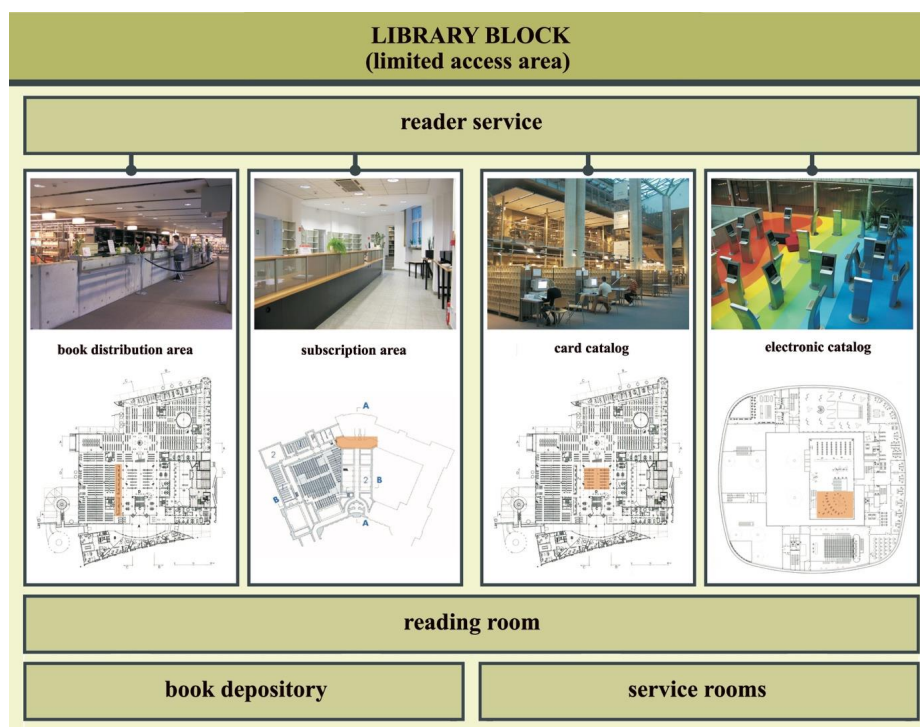

Fig. 2. Functional and planning elements of the library block

Source: own work.

A *reading room* is a room or part of a library space and is equipped with stations for working with information on various types of media (Fig. 3).

The following reading rooms are distinguished:
– General reading room: the main room in the structure of any library designed for familiarisation with general scientific literature; it can be single-level or multi-level and is often equipped with its own book distribution department.
– Sectoral reading room: a room for the study of specialised literature. It is often a separate structural unit of the library with its own book collection. A library located in a separate building may have in its structure several reading rooms with books devoted to a particular field and related sciences.
– Periodical literature reading room: rooms for processing periodicals. It may be accommodated in a separate hall in the general structure of the library or in a separate area of the main reading room. Shelves with periodicals are usually placed directly in the hall, except for large-format periodicals (newspapers, magazines, illustrations) or especially valuable publications.
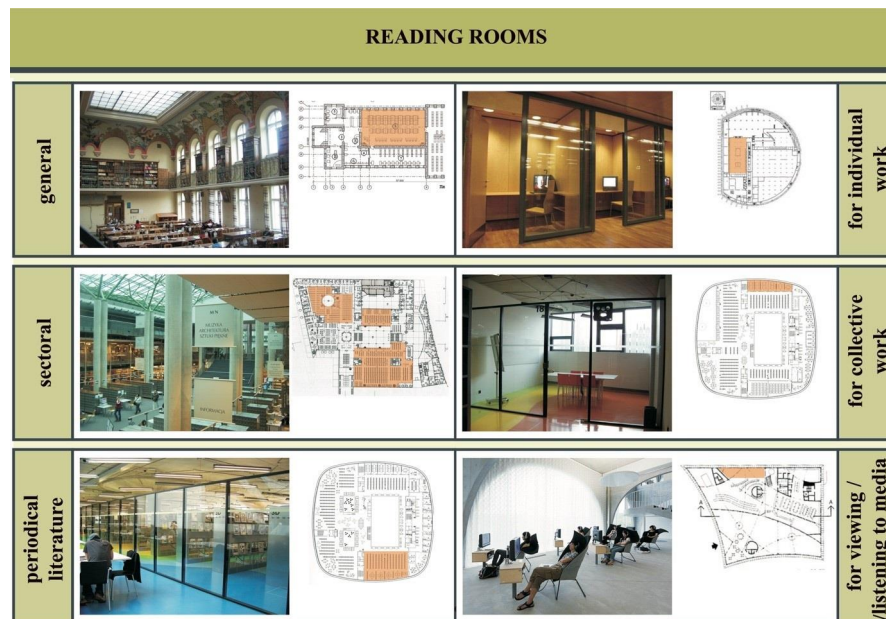
Fig. 3. Types of reading rooms

Source: own work.

- A room with seats for individual work: a space equipped for an individual to work conveniently and efficiently. The most common form of organisation of a place for individual work is a personal cabin (about 1.5 × 2.0 m), in the shape of a separate cell.
- A room with places for collective work: a space equipped with everything necessary for convenient and high-quality use by a different number of people. To avoid the spread of noise generated during collective work, the group space shall be separated from the reading room by partitions (in modern libraries, translucent partitions are used).
- A room for viewing/listening to media files: a space equipped with appropriate technical means. It can be in the form of separate special rooms in the structure of the library, or a dedicated area within the library hall or general reading room.

The number of seats in the library reading rooms is calculated as a proportion of the total number of readers. The standard for providing reading places in libraries of higher educational institutions is 12% of the number of full-time students (Paperno, 1969).

A *book depository* is a room with special humidity and temperature control equipment that should optimally meet the fire safety requirements, have dust level sensors and microorganisms protection means, etc. (Fig. 4).

The space-planning solutions for the structure of book depositories that largely determine the composition of any library include three main types: underground, ground-level and combined.

Underground book depositories are used to store large volumes of library stock (more than 1 million items in collections). Library users do not have access to them. There are single-level and multi-level underground book depositories. Ground-level book depositories are used to store library collections of any size. They can be either closed or open for free access to library users. There are single-level and multi-level ground-based book depositories. Combined book depositories are utilised to store large and extra-large volumes of library holdings, some of which are open to free access by library users. Combined book depositories are primarily multi-level.
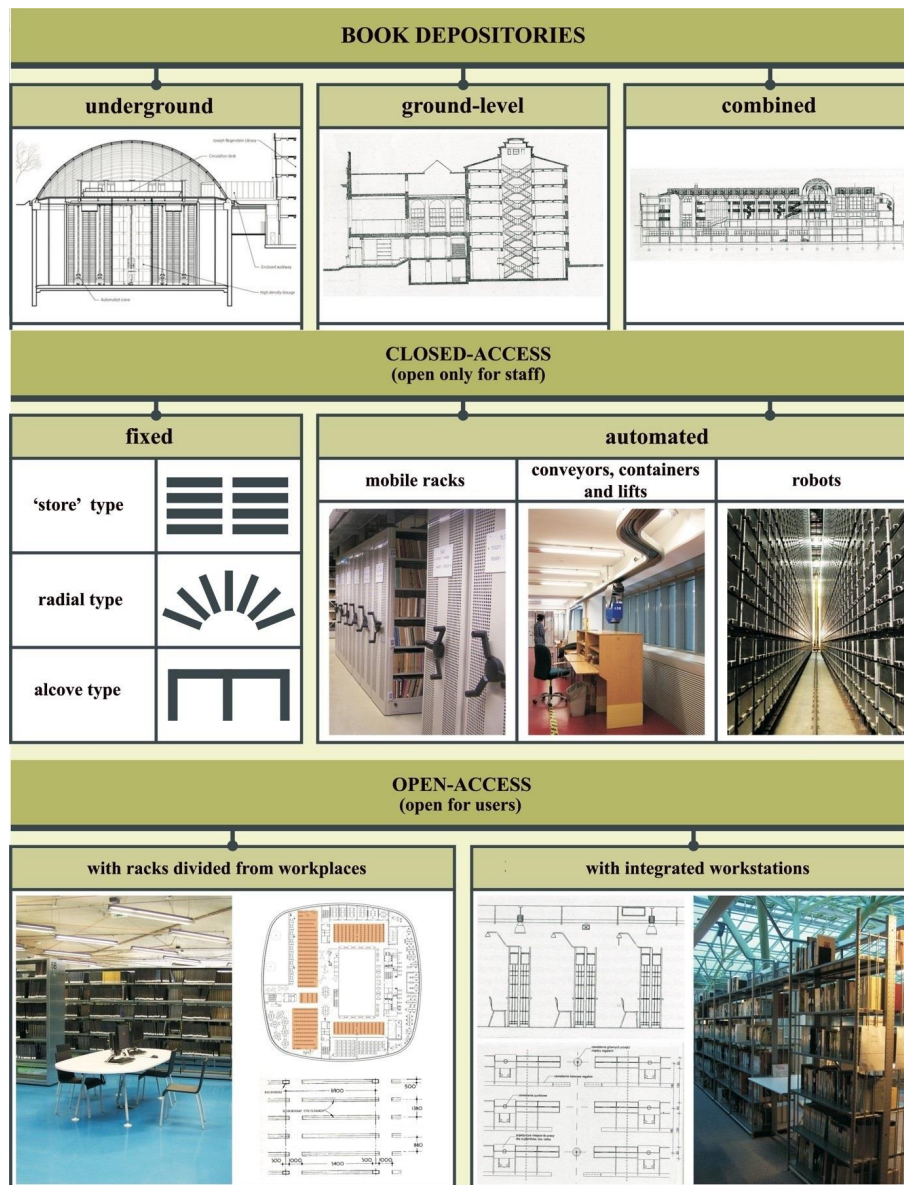
Fig. 4. Types of book depositories

Source: own work.

According to the method of accessing the book depository holdings, there are two-types: closed-access and open-access types. Only library staff are permitted to enter the closed-access book depository, while the open-access book depository provides free access to all users.

Closed-access book depositories include fixed and automated book depositories. In fixed book depositories, the library holding is located on fixed racks in the appropriate order. There are three types of rack placement:
– 'Store' type: orderly placement of book racks following the principle of parallel rows. Racks and structural elements are separated by aisles, the smallest width of which is 0.75 m between the racks; 1.2 m between the ends of the racks, 0.75 m between the wall and the rack parallel to the wall and 0.45 m between the wall

and the end of the rack. Book depositories of the 'store' type are single-tiered or multi-tiered. In multi-tiered ground-based book depositories, in addition to side natural lighting, light lamps are often arranged, and metal ceilings with a lumen are also used to better illuminate the lower tiers (Voronkova, 2016).

– Radial type: a system of flexible placement of racks in a circle, the centre of which is the department of book distribution. This principle of placing shelves in book depositories has not become widespread, due to the complex organisation of internal itineraries for handing out books. It is mostly used in reading rooms with open access to racks.

– Alcove type: a system of U-shaped placement of book racks, where one rack is located along the wall, and the other two are perpendicular. Inside the resulting space, reading desks (or tables) are placed, which are used to view the ordered book items. This principle of rack placement is typical for libraries with open access to racks.

Automated book depositories are equipped with equipment to speed up the process of finding and providing a book to the reader. There are three types of technical equipment:

– Mobile racks: movable storage systems that move easily, match with each other and open in the right places. They are designed to minimise the needed space and optimise access to stored materials. There are mechanical and electronic racks.

– Conveyors, containers and lifts: technical equipment designed to transport materials ordered by the user to the distribution point. Conveyors and containers are used for vertical and horizontal transportation, lifts are meant only for vertical delivery of books.

– Robots: a system for the search and delivery of materials based on the use of radio frequency identification marks (RFID). It is used in modern book depositories.

One of the most interesting examples of an automated underground book depository is the University of Chicago Library. Each copy of a book in the library is equipped with a unique RFID chip that contains specific information about it. When you borrow or return a book, the chip is scanned and changes are automatically entered into the database. The library stock is stored in special three-tier racks, and robots are used to search for and deliver books to the RFID scanner. The average search time for five books is about 2.5 min (Voronkova, 2012).

Open-access book depositories can be of two types:

– with racks divided from workplaces: racks are placed around work desks, creating a closed space for individual work; in open access, the passage between the racks is recommended to be at least 1 m;

– with integrated workstations: desks are placed directly within the space of the book rack.

Service rooms include premises for the compilation and processing of book stock, research departments, service catalogues, administrative and economic sections, and auxiliary premises (Fig. 5). At the same time, it is necessary to provide several staff entrances in the library, for example, for loading and unloading documents, for library staff, for supplying products to the buffet or dining room, etc. (Aleshin, 2008).

The office premises include administrative sections, office rooms, a recreation area, a staff kitchen, and special-purpose rooms.

Administrative premises include a director's office, a meeting room, secretariat, registry department, an accounts department and an administrative and economic department. The number of administrative premises and their designations depend on the size of the library and the number of administrative staff, as well as their positions and functions.

Service rooms are the rooms where the main work processes take place to ensure the functioning of the library. The area of the rooms is determined by the standards per employee: 5–6 m^2 per person in a room for three staff members and 4.0–4.5 m^2 per person for a room to fit more employees (Pashchenko, 1941).

Fig. 5. Types of service rooms

Source: own work.

The recreation room or area is designed to relieve fatigue, visual tension and emotional stress of library staff. In large libraries, lounges should be located in the appropriate units; in small libraries, one common room is sufficient.

A staff kitchen is provided for refreshments and food consumption. For 6–10 library employees, a room with an area of 12 m² shall be allocated, and 2 m² shall be designed to fit kitchen equipment.

Special premises include: a restoration workshop, a bookbinding room, a disinfection room, printing house, a photo cabinet and a carpentry workshop. The availability of special premises depends on the size of the library and its functional purpose.

Typically, parameters for the required area for librarians' workplaces are obtained through analytical and synthetic methods that account for the peculiarities of library work in different processes and differentiate the required working areas for librarians, administrative staff, technical workers and managers.

In the libraries of the 21st century, there is a tendency to integrate various production processes into the traditional learning process. There are spaces for collective learning such as group study rooms, photography and video workshops, a 3D printing workshop, rehearsal and game rooms, a music recording studio and a model workshop (Sirel, 2021). The introduction of the latest technologies and updated spaces expands the boundaries of the classical library's functioning and enhances its important educational role in society. This directly affects the quality of education, diversifying and improving its traditional methods.

The real challenge for libraries in the 21st century was the COVID-19 pandemic. Even before the pandemic, libraries began to transition from physical to digital collections and services. Thus, in developed countries, educational institutions and libraries that serve them switched to a remote mode of operation during the epidemic. However, in underdeveloped countries, where access to the internet is often absent and the digitisation of the library collection is slow, the educational process took place in a hybrid form (Rafiq, Batool, Farzand Ali & Ullah, 2021).

Another important element to consider when creating a comfortable environment in various library rooms and spaces is light. Both natural and artificial lighting are actively used in library buildings. However, the specifics of the functional and planning organisation of libraries and the wide use of glass in library architecture require the architect to pay special attention to the use of natural lighting (Voronkova & Podlasek, 2024).

CONCLUSIONS

When designing and constructing university libraries, it is critical to take a thoughtful approach to their functional and planning organisation to facilitate their transformation into a multifunctional units. A modern university library is no longer a place for the accumulation and storage of printed materials. It is now an open and accessible public space with a flexible layout designed to meet the varying needs and functions of library users. The library of the 21st century creates a special psychological environment, fostering an atmosphere of hospitality and friendliness. It demonstrates an interest in the needs of each visitor and utilises a variety of 'non-verbal' means of communication, such as design, space organisation and colour solutions. These aspects help to overcome the barrier of alienation between visitors and the 'official institution'. At the same time, changing functions in various library premises and spaces significantly reduce the psychological burden experienced by individuals when staying in a monotonous information environment.

The powerful development of information and communication technologies and their active implementation in daily library processes have changed the way information is stored. The traditional printed copy has received its digitised counterpart. Instead of disappearing as a physical institution by going digital, the library has taken on a new meaning by combining classic teaching and research models with new user-centred services.

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SPECYFIKA ORGANIZACJI FUNKCJONALNEJ I PRZESTRZENNEJ BIBLIOTEK UNIWERSYTECKICH

STRESZCZENIE

Biblioteka uniwersytecka to przestrzeń, w której zachodzą złożone procesy organizacyjne, przeplatają się różne obszary funkcjonalne i współistnieją odrębne harmonogramy ruchu. Jeśli fizyczna przestrzeń biblioteki nie zapewnia wysokiej jakości warunków pracy indywidualnej i grupowej, szybkiego i swobodnego dostępu do zasobów informacyjnych, możliwości korzystania z komputera i ze sprzętu kopiującego itp., to taki obiekt nie będzie odwiedzany zbyt często. Wszystko to determinuje specyfikę organizacji wewnętrznej przestrzeni biblioteki. W celu ustalenia tego należy ponownie przeanalizować strukturę przestrzenną biblioteki z punktu widzenia możliwego rozwoju funkcjonalnego. Z tego powodu celem artykułu jest podkreślenie głównych elementów funkcjonalnych i przestrzennych współczesnej biblioteki, których obecność lub brak bezpośrednio wpływa na jakość jej funkcjonowania.

Słowa kluczowe: biblioteka uniwersytecka, organizacja planowania funkcjonalnego, czytelnia, magazyn książek, pokój obsługi