THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF ARCHITECTURE – ARCHITECTURAL ORGANIZATION OF MODERN LIBRARIES

ILDA KOCA, MSc. Arch., MSc. Energy efficiency, renewable energy sources and environmental protection, Ph.D. student, Faculty of Civil Engineering and Architecture in Nis, University of Nis, Serbia

DANICA STANKOVIC, Ph.D., Associate Professor, Faculty of Civil Engineering and Architecture in Nis, University of Nis, Serbia

Abstract: The methodology of designing library objects has changed throughout history. Their change is the result of the dynamics of modern life, as well as of the modified readers' habits caused by the rapid development of information technology. This paper discusses the change in the functional disposition of the 21st century libraries in relation to traditional design patterns. The results show that, in the battle against the unrestricted source of information provided by the Internet, library objects will survive only if their functional characteristics are transformed in accordance with the needs of the modern, digital age.

Key words: architectural organization, functional organization, information technology, multifunctional spaces.

1. Introduction

The library buildings have always shown the identity of the people who built them, and no type of institution in the history of humanity has represented such a cultural headquarters as libraries. They kept the true cultural treasures and featured important manifestations, gatherings of artists and scientists where they studied, taught, discussed, and competed in different disciplines. This multifunctional library function is now intrigued by architects around the world. Nevertheless, the new era brings new challenges in the methodology of library design. In this context, a crucial event that will determine a new way of life is providing the planet with a global network – the Internet. In this way, living space has been transformed into “one type of global television studio for world events” [1].

If we take into account that “the modern age is rich in its variants of the understanding of space and time, and in terms of its objects that arise from it” [2] then the expansion of the construction of new, complex spaces in libraries is a rational result of these changes. “Space is certainly not a new concept in architecture, but in contemporary literature we distinguish two uses: space as a three-dimensional geometry and space as a field of perception” [3]. If we talk about architecture as the field of perception, that is, the “extension of nature, which provides the basis for perception and horizon for understanding and experiencing the world” [4], then the architects broaden the idea of understanding, promoting and affirming the culture of the modern world. There remains a key question of the open character of whether and how architecture will contribute to the survival of libraries, at a time when libraries, with an almost unlimited collection of books, exist on every personal computer.

2. The Change of the Traditional Patterns of the Architectural Organization of the Library

Beginning in the twentieth century, the methodology of designing libraries began to treat and question the functionality of these facilities. The proper disposition of the facilities in the library, was previously determined according to the following list: entrance area, area of utility rooms and external traffic, technical area, administrative area, reading area, catalog, warehouse
area, area of reception and processing of the book, area for exhibiting and borrowing of library material.

On the other hand, in the past two decades, academic libraries have “dramatically changed their physical spaces. The traditional model of reading rooms and dark rooms separated by piles of books is not compatible with the digital age” [5]. Today, libraries serve “less as a source of research material, and more as a refuge from social disturbances caused by all technologies and applications that permeate human lives” [6].

With the advent of information technology, the focus of the functional organization of the library is changing. In academic libraries, “information communities in response to new pedagogical approaches and the rapid development of information technology and education models” were built [7]. Administrative zones, which were prioritized, become less important in conceptual terms, and give place to the user space. One of the great challenges in the design of today's library is the creation of clarity and effective interaction between spaces of different purposes and the main goal is to optimize functionality and user experience. Therefore, an important new dimension in regard to the historical status of the library is the experimental development of space for new interactive experiences. Thus, architects use technology as a means to encourage curiosity, inspiration and the user's desire to learn. And according to Cohen, engineers “like the idea of establishing a connection between digital and physical space” [8]. In table 1 the comparative differences between the characteristics of the traditional and modern library were presented.

| Libraries before the digital era | Libraries of the digital age |
|---------------------------------|-----------------------------|
| Deprived of the presence of decoration and attractiveness, the entrance parterres serve to introduce users into the library space. | Entry parterres are designed to impress and intimidate users and to awaken the desire for research and learning in them |
| The administrative zone is separated and is most often located on the upper floors of the library building. | The administrative zone exchanges the place to the user area – the offices are in the peripheral parts of the library, and they are characterized by an open plan i.e. offices with no walls. |
| The basic functional zones of the libraries are reading rooms and rooms where books are showcased. | There is no primary functional zone – zones interweave and create a free library plan |
| Traditional reading rooms create a formal and rigorous environment. | The reading rooms without walls and spaces without visual barriers form an informal space in which users move freely. |
| Open public areas and meeting rooms are gladly visited, while the shelf areas are quiet and empty. | All parts of the library are equally visited; there are no “dead” points. |
| Vast rows of bookshelves look dark and uninteresting. | In the interior of contemporary libraries, it is especially important to create positive impressions of users in relation to the area where the books are exhibited. |
| User movement is short and purposeful. | User movement is diverse and interesting; the act of movement itself plays a role in performing primary activities (learning, reading, visiting exhibitions, etc.), but also the role in creating your own experience. |
| Uniform spaces. | Each functional zone is unique in aesthetics and design. |

Table 1

Differences between the characteristics of traditional and contemporary library (Source: Author)
Unlike traditional libraries, modern architecture gets the epithet “fantastic” [9]. Flexibility and multifunctionality are the cornerstone on which the “fantastic” library project is based. However, no inclusion and innovative design process will be able to accurately predict the future. That is why, in all places in modern libraries, we encounter flexibility. Accordingly, “traditional library spaces, characterized by stability and durability, are today replaced by a space that must respond to the imperative of adaptability and “fluidity”: because “the growing fluidity of information is embodied in physical spaces” [10].

Users need to have many choices that enable them to gain knowledge. Such choices must support an environment – a space that can be adapted to the needs of the reader – to learn, create, meet with other users and be seen. Every part of the library space contributes to this design concept: corridors expand to become expanded classrooms, stairs are converted into sitting areas, and walls are used as surfaces for writing or displaying Wi-Fi or TV channels on the screen. Accordingly, in order to become a “living space”, the library must “abandon part of its universality and holiness to turn its face to reality” [11].

3. Functional Criteria of Contemporary Library Space

In order to enable the continuous development of contemporary library workflows, but also to create an inviting ambience for visitors with new, modified reading habits. Architects analyze the question: what exactly should the 21st century libraries contain? In this way they come up with an answer that primarily refers to the inviting and inspirational spaces. However, the layers of the library’s inspiration are reflected in the satisfaction of a number of functional and aesthetic criteria of the space shown in Diagram 1.

The contemporary architectural organization of libraries involves free plans, which basically allow for the changing of the environment, so that users can, using mobile or foldable walls, convert silent reading rooms and individual learning into large conference rooms, or spaces for performing artistic performances. Such, flexible spaces enable direct contact, group work, as well as independent work.

Within flexible, it is necessary to determine both static and unrepeatable “points” of the interior. These are, most often, shelves with books, which define the overall development of the interior. The organization of collections with specific combinations is determined by the size of the fund which the library has, but also by the topic and up-to-dateness. It is very important that the space is easy to “handle” the staff. A simple route of the staff provides efficient workflows, and the appropriate equipment, the location of book carts, provide additional measures to ensure employee productivity.

---

**Diagram 1. Functional criteria of contemporary library space** (Source: Author)
In addition, library space rich in content is nowadays highlighted with glass bulkheads that allow for an uninterrupted view of all zones. Opening a line of sight into neighboring spaces makes learning public – during continuous monitoring of users' work, mutual cooperation is encouraged and a public forum for the exchange of experiences is being created. Here we come to the notion of architectural transparency, which may be best seen on the example of the library of the British International School in Houston, Katy, Texas, where learning is “visible”. The entire building is “wrapped” around a common area, called Agora. All the walls of the classrooms surrounding Agora are made of glass. From this central gathering place, students of all ages can take a peek and look at other classrooms. However, glass from the floor to the ceiling is not the only way to achieve transparency. Perkins uses an affordable alternative – strategically placed glass windows – at the Cleveland International School, to create a continuous line of sight throughout the space. In addition, the goal of such moves is identical – allowing the users to gain inspiration from the work of others. In fact, through visual transparency, a public talk about learning is being established.

4. Typology of Functional Zones

Sometimes the form of architectural objects is above the function, sometimes the function dictates the form, and sometimes the form follows the form, but “all the explanations of the architectural form are based on its function as a sign of imbalance. The sign is a spatial form, and the meaning is the essence of architectural action” [12]. Thus, the form of the interior and the organization of space in libraries derives from its primary function – providing conditions and space for learning, which is based on the discovery and the creative cognitive process. Most often, learning activities are performed in indoor and semi-closed areas. Given that there are four key user activities: learning, experiencing, meeting (interacting with other users) and creating, different spaces and the purposes of the surfaces given in Diagram 2 emerge from these activities.

Furthermore, various functional zones are derived from this type of space. In Diagram 3, a typical scheme of functional zones of today's library is shown – entrance parterre (orange circle), children's department (purple circle), workshops (green circle), classrooms and reading rooms (light red circle), warehouse and storage spaces of books and materials (dark blue circle), administrative zone (gray circle). These areas surround the space for interaction and socializing, which is the framework of the development of user experience (light blue circle). However, all these zones belong to the inspiration space, that is, a clear tendency is to create an object that, in its every part, offers an inspiration for the learning and spiritual development of the individual.

In many libraries, requests for facilities of spaces are based on the fact that learning activities are based on information technology. Therefore, the basic starting point for the functional equipping of this zone is the integration of information technology into the physical space, which sets requirements for equipment, computers and desk desks design. For example, if we would now consider the library space in detail, we would come up with a schematic zoning plan, shown in Figure 1. Namely, near the entrance is where the zone with info-panel (gray circle) is usually located, offices for employees are nearby (red circle), then we come to the space intended for the research and learning of the youngest users (the green circle), while the area for teenagers is
A typical functional zones scheme of a contemporary library (Source: Author)

Legend:
- Entrance parterre
- Offices for employees
- Space for children
- Area for teenagers
- IT and meeting rooms
- Reading rooms and classrooms
- Cafe-forum for young people

Diagrams visually separated by a barrier (orange circle). Within the library units there are IT and meeting rooms (yellow circle), while reading rooms and classrooms, with study space, are grouped in the rooms shown on the plan up-right (dark blue circle). The central place, yet, takes a café – informal forum for young people (purple). This type of functional scheme is determined according to the noise level, and the principle of visual interconnection between functional zones, shows a new standard in the construction of libraries.

At the theoretical level, “established criteria for determining the interrelations of elements – the holders of multiple spatial contents – in the program terms, take multifunctional definitions by adding, overlapping or combining of different spatial events and experiences” [13]. However, how functional zones are combined in space depends on the focus and main purpose of the library – focus of some libraries will be on conferences and meeting rooms, some will be based on the needs of younger users, offering different spaces for learning and children socialization.

5. Conclusion

A contemporary library is not viewed as a unique, unrelated, self-sufficient physical structure. It becomes part of a single mosaic of a social and academic core of the city, which should be in a clearly defined relationship with other objects nearby, with roads, with space, time, and information as such. According to Tschumi “there is no architecture without events, there is no architecture without action, without operation, without function. Architecture is viewed as a combination of space, events and movements without a hierarchy or advantage
among these terms” [14]. Likewise, library architecture is not a simple list of fulfilled technical and technological tasks of the projects. What remains of essential importance in the design of today’s media library is the purposefulness and determination of the spectrum of functional zones within the object. To the question on what kind of functional zones to create in a modern library space that will deepen the idea of architectural work and create positive associations on the notion of culture and learning processes, the answer may lie in spaces that allow “the appropriation of a place through personal experience, which is happening both on the physical and the spiritual level” [15]. On this path, many architects choose to use synergy between old, almost romantic library spaces and new, technologically equipped and multifunctional interiors.

By matching the needs of the modern user, we arrive at the definition of an architectural program, and the establishment of a balanced composition of functions is a central task in the process of architectural design of libraries. In doing so, each new task must “involve re-examining the needs structure as well as the structure of functions, and the final outcome would, by definition, always represent a new value” [16]. Finally, due to this value, libraries, as physical objects, correspond to modern reading needs, and through the stimulation of personal and interactive experience, enable new ways of knowledge acquisition.

**References**

1. Head, A.J. & Eisenberg, M.B. (2011). Balancing act: How college students manage technology while in the library during crunch time. Seattle, WA: Project Information Literacy Research Report, the University of Washington Information School, 49. The sample was 560 undergraduates from 10 campuses distributed across the US.
2. Bennet, S. (2009). Libraries and learning: A history of paradigm change. Portal: Libraries and the Academy, 9(2), pp. 181-197.
3. Calenge, B. (2009). Editorial. In: Bulletin des Bibliothèques de France, T. 45, No. 3/2000, p. 1.
4. Ćarls, D. (2007). Moderni pokreti u arhitekturi. Građevinska knjiga, Beograd.
5. Cekić, N. (2008/09). Teorija arhitektonske forme. GAF Niš, Predavanja za doktorske studije.
6. Dadić Dinulović, T. (2013). Fenomenologija spektakla: Scenski dizajn kao sredstvo konstrukcije dogadjaja. Novi Sad, Univerzitet u Novom Sadu.
7. Đokić, V., Bojanić, P., urednici (2010). Teorija arhitekture i urbanizma. Arhitektonski fakultet Univerziteta u Beogradu, Beograd, p. 264.
8. Milenković, V. (2004). Arhitektonska forma i multi-funkcija. Beograd, zadužbina Andrejević.
9. Mijić Miomir (2001). Akustika u arhitekturi. Nauka, Beograd, p. 19.
10. Pallasmaa, J. (2007). THE EYES OF THE SKIN Architecture of the Senses. Wiley-Academy, Great Britain, p. 41.
11. Radović, R. (1998). Savremena arhitektura između stalnosti i promena ideja i oblika. Novi Sad, FTN.
12. Rizzo, Joseph C. (2002). Finding your place in the information age library. In: New Library World, Vol. 103, Iss. 11-12, pp. 457-466.
13. Bonnanda, S. & Donahuea, T. (2010). What’s in a name? The evolving library commons concept. College and Undergraduate Libraries, Vol. 17(2-3), pp. 225-233.
14. Tacheau, O. (2009). Pour une bibliothèque universitaire réincarnée. In: Bulletin des Bibliothèques de France, T. 54, No. 6/2009, pp. 66-69.
15. Tschumi, B. (1983). Spaces and Events, from the Discourse of Events (London: Architectural Association), p. 6.
16. Virlio, P. (2011). Kritični prostor, Gradac, Čačak-Beograd, p. 12.
ТЕОРЕТИКО-МЕТОДОЛОГИЧЕСКИЕ ОСНОВЫ АРХИТЕКТУРЫ —
АРХИТЕКТУРНАЯ ОРГАНИЗАЦИЯ СОВРЕМЕННЫХ БИБЛИОТЕК

ИЛЬДА КОКА, Магистр архитектуры, магистр по направлению
энергоэффективность, возобновляемые источники энергии и охрана
окружающей среды, аспирант, факультет строительства и архитектуры,
Университет в Нише, Сербия

ДАНИЦА СТАНКОВИЧ, Доктор Ph.D., доцент, факультет строительства и
архитектуры, Университет в Нише, Сербия

Аннотация: Методология проектирования библиотечных объектов менялась на протяже-
нии всей истории. Их изменение является результатом динамики современной жизни, а также из-
менений привычек читателей, вызванных быстрым развитием информационных технологий. В
данной статье рассматривается изменение функционального расположения библиотек 21 века по
отношению к традиционным моделям проектирования. Результаты показывают, что в борьбе с
неограниченным источником информации, предоставляемой Интернетом, библиотечные объекты
выживут только в том случае, если их функциональные характеристики будут преобразованы в
соответствии с потребностями современной цифровой эпохи.

Ключевые слова: архитектурная организация, функциональная организация, информаци-
онные технологии, многофункциональные пространства.