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**THE LIBRARY OF THE FREE UNIVERSITY OF BERLIN.
ENVIRONMENTAL FRIENDLINESS AS A RESPONSE TO MODERN
CHALLENGES**

Objective. The article deals with the functional organisation and design of the Free University Library in Berlin, which has become not only an information centre, but also a centre for supporting research, supporting and providing education and training with a green space. **Methods.** The article is the result of the thorough study of the Internet resources about “green” libraries and the Philological Library of the Free University of Berlin. **Conclusion.** The library is an example of how to implement the philosophy of sustainability in all processes of the organisation's life, without detracting from the importance of scientific and information support for the teaching and research process. **Results.** The article was an attempt to describe the ways in which modern technologies go hand in hand with resource-saving policy, which could be implemented in the university libraries of Ukraine.

Keywords: Free University of Berlin; Germany; philological library; green library; open access; pedagogical activity; service

Introduction

The Free University of Berlin's library refers to one of Germany's largest educational institutions. The library successfully combines research, teaching and research with the sustainability of spaces and the philosophy of environmental compatibility of the library in the modern world.

In recent years, researchers have been interested in the library as a place of public use. One of the most important challenges of our time is the problem of reducing the ecological footprint in everyday life. Therefore, in addition to the availability and accessibility of services provided by the library, it is now important to find ways of transforming libraries into ecologically friendly spaces. For example, the library of the Free University of Berlin has its own solar energy supply, the main library's premises are oriented towards natural light with a system of mirrors for efficient distribution and a point lighting system for organising the visitor's private space in an energy-saving manner. The library is designed to be heated exclusively by sunlight, considering the winters in Germany, and air conditioning is achieved by a system of gates and ventilation hatches. (Hauke & Werner, 2012). The library follows the principle of not using excess paper and printouts. All library software is purchased only from companies that adhere to environmental principles. The same applies to furniture and stationery.

Methods

The article is the result of a thorough study of the Internet resources about the Green Library and the Free University of Berlin Philological Library.



Figure 1. Free university of Berlin, the Philological Library

Results and discussion

The Free University of Berlin is the largest university in the capital and one of the elite universities in Germany. Created in 1948 on the initiative of a student committee as a public law subject with wide self-government rights, it was the driving force behind the 1968 student protests (Freie Universität Berlin, (n. d.)).

The Freie Universität is the largest university system in Germany. It consists of the university (central) library and 15 department libraries with a total collection of approximately 80,000 printed units, 70,000 electronic journals, 500,000 e-books and 1600 databases. The publications issued after 1990 are fully digitized and available through OPAC. The Library has the status of the UN Depository Library and is linked to the UN Global Library System under the direction of the Dag Hammarskjöld Library in New York. The Free University Library also operates as the European Documentation Centre of the European Union. As part of the UN and EU Library, it contains all publications of the UN General Assembly, UN Security Council, International Court of Justice as well as those of the Council of Europe and the Organization for Security and Cooperation in Europe (Bibliotheken, (n. d.)).

In addition to standard services such as subscription, bibliography, use of reading rooms and access to the Internet, visitors are offered ways to use the library space, such as working in a separate office (this requires booking), small group rooms with and without interactive whiteboards, a multimedia room equipped with a Blue-ray player and an Internet-connected TV. The library also offers a room for visually impaired people, who can take advantage of library resources using special computer peripherals. The university's research repository is very useful, thanks to which students and scientists can read articles and monographs on the topic of their research.



Figure 2. The entrance hall of the Philological Library

The Free University is known for its humanitarian studies. The Dahlem Humanities Center, for example, is a research institute in this field in Germany (Kords & Zavorodnia, 2013). Its characteristics are rare specialisations such as Arabic and Judaic Studies, as well as Slavic Studies. The Centre for Area Studies brings together regional studies in North and Latin America, Eastern Europe and East Asia, the Middle East and selected European countries. In turn, the Otto Suhr Institute (Otto-Suhr-Institut für Politikwissenschaft) is one of the most prestigious political science cells in Europe. This wide variety of humanities and specialities has led to the need for a separate library that meets the needs of students and researchers. To this end, a philological library was built in 2005, containing a collection of books from the following sections: General and Comparative Literature Studies, English, Byzantine Studies, German Studies, Indian Philology/South Asian Studies, Classical Philology, Latin American Institute, Mid-Latinist Philology, New Greek Studies, Dutch Studies, Philosophy, Roman Studies, Slavic Studies (Literature Studies), Comparative and Indo-European Linguistics.

The services of the library are available to all residents of the city. (Brake & Kress, 2011). The need for a library card arises only when the reader wants to take a book home or use the Internet. There is a separate room where visitors can make a photocopy. As in other libraries in the system, you can book a separate study room for scientific work or a separate room for group activities. Students can rent a book storage box so that they do not have to carry books home after class. Teachers can use a digital copying service to order. The library is open on weekdays from 9.00 to 22.00 and on weekends from 10.00 to 20.00. The library has a total of 25

librarians, some of whom are university students, who work mainly in the evening and on weekends. This is how the question of library opening hours is resolved (Boyarinova, 2018). The Free University Philological Library is a reference-type library, where visitors work with indoor sources, while the subscription is for night work only (Hallmann, 2013). On the university's website you can find an interactive map of the Philological Library, with which you can navigate freely in the library room and find the necessary sections of literature on the shelves.



Figure 3. Curved lines and the dynamic structure

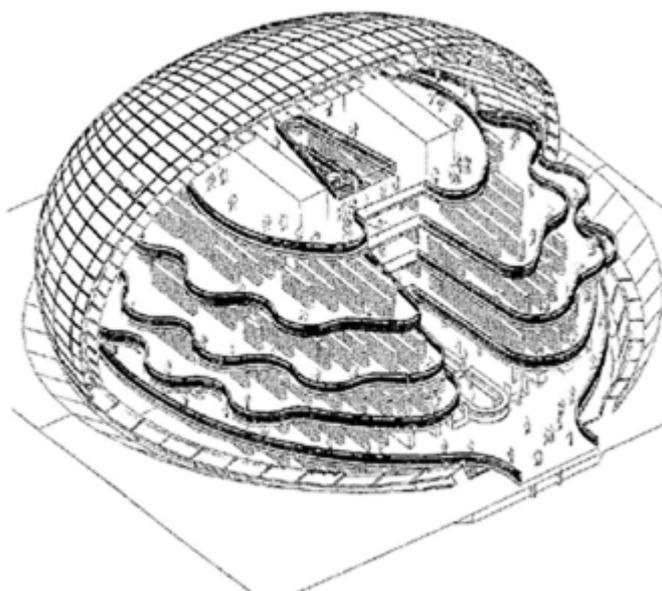


Figure 4. "The Brain": the project of the Philological Library

The building of the Philological Library (Fig. 1) was designed by London-based Foster and Partners as part of the modernisation process and contains eleven previously separate departments. (Werner & Diecks, 2004). It was the one that has become a model of how modern technology can contribute to creating an environment-friendly space. (Fig. 2). The structure complements the existing building of the Humanitarian Institute, which was built between 1967

and 1979, whose design was developed by German architects together with Jean Prouvet. The originality of the new building designed by Norman Foster lies primarily in the cellular structure of the shell made of steel, glass and aluminium. The second fibreglass shell covers the core of the building itself and is shaped like a dome. Under the dome is a curved shape cladding that follows the shape of the brain. Thanks to this shape, the library is popularly called the 'Berlin Brain' (Kords & Zavorodnia, 2013). The characteristic feature of the library is the combination of a monolithic concrete structure and a permeable coating. They define the ecological concept of the building, according to which natural light and ventilation are essential elements. Bookshelves are centrally located on all four levels and framed by desks. The individual levels are curved, so that a dynamic structure with spacious mezzanine is created in the interior. (Fig. 3). The facade is both a heat conductor and a buffer - individual panels can be opened depending on the weather. The massive internal concrete structure acts as a heat accumulator and is additionally cooled or heated by water pipes. For most of the year, the library is fully ventilated through the outer shell and daylight is also natural (Philologische Bibliothek der Freien Universität Berlin, (n. d.)). Thus, 60% of the ventilation used during the year is natural ventilation, i.e. free of charge. (Fig. 5, 6).



Figure 5. Natural ventilation



Figure 6. Daylight

The building is oriented from west to east so that the Wind Rose creates and amplifies air circulation along the contour between the shells and the interior. There are some other engineering solutions in the building that only allow air conditioning to be switched on 13 days a year. During the rest of the year, the library maintains a natural temperature of 21-22 °C, which is convenient for people and books alike.

An interesting architectural solution for energy saving is the Allen rule, according to which warm-blooded animals have shorter body parts in cold climates than similar species in warm ones. As a result, animals living in cold climates acquire a smaller specific body surface and therefore lose less heat. This idea has given birth to the outer hemisphere shape of the library (Hallmann, 2013).

The library, like many modern institutions, has colourful waste bins. The library also recycles used paper. But as Klaus Ulrich Werner, Head of the Department for Philosophical and Humanistic Libraries and the Free University Library of Philology (Berlin), points out, at the same time the library is trying to extend the life of books for as long as possible, so only books, which have long since lost their relevance, are recycled. Others are repaired or given away as part of charity events. (Freie Universität Berlin: Startseite (n. d.)).

Conclusions

As we have seen, the Philological Library of Berlin Free University implements and uses both passive and active strategies and innovations to ensure that it is environmentally friendly. The design and architectural solutions offered by the designers have made it possible to significantly reduce the costs of heating, lighting and air-conditioning in the premises.

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БІБЛІОТЕКА ВІЛЬНОГО УНІВЕРСИТЕТУ В БЕРЛІНІ. ЕКОЛОГІЧНІСТЬ ЯК ВІДПОВІДЬ НА ВИКЛИКИ СУЧАСНОСТІ

Мета. Бібліотека Вільного Університету в Берліні - це бібліотека одного з найбільших навчальних закладів Німеччини. У статті розглядається функціональна організація і конструктивне рішення бібліотеки Вільного Університету в Берліні, яка стала не тільки центром інформації, але поєднала в собі центр підтримки наукових досліджень, підтримки та забезпечення навчального та освітнього процесу з екологічним простором. **Методи.** Стаття є результатом ретельного вивчення Інтернет-ресурсів про «зелені» бібліотеки та Філологічну бібліотеку Вільного університету Берліна. **Висновки.** Бібліотека є прикладом втілення філософії екологічності всіх процесів життєдіяльності організації, не применшуючи при цьому значущості наукової та інформаційної підтримки навчального процесу і наукових досліджень. **Результати.** Стаття була спробою описати способи, за допомогою яких сучасні технології поєднуються з політикою економії ресурсів, і які можуть бути впровадженими в університетських бібліотеках України.

Ключові слова: Вільний Університет в Берліні; Німеччина; філологічна бібліотека; зелена бібліотека; відкритий доступ; педагогічна діяльність; сервісність