Office spaces in conditions environmental problems of cities

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Abstract. The article discusses the principles for the formation of a sustainable architecture of office spaces in the context of such a global environmental problem as a pandemic. Current trends and general principles of the formation of office spaces in the post-COVID period, the direct relationship between the health of employees, the office ecosystem and the concept of "typology of organizational cultures of the company" are analysed. The main attention is paid to the architectural aspects of organizational models of office objects. The principles and techniques for creating a healthy efficient workspace, which a sustainable office complex should have, are formulated. The reconceptualization of the organization of office activities and methods of adapting traditional office spaces in a pandemic with the prospect of their development in the post-COVID period are considered. The most "viable" types of office spaces and models of workplace organization are singled out in these conditions. It is based on the opinions of business experts related to the further development of office activities, possible changes in internal strategies in the organizational culture of companies. Optimal architectural solutions for the organization of safe and demanded office spaces are proposed.

1. Introduction

The pandemic has become the strongest shock for the whole world. It has changed our lives and is sure to leave its mark on people's minds. Under the influence of the pandemic, a number of trends have formed in the world, especially in the organization of office spaces. In the future, humanity will pay more attention to the impact of architecture on health. Design for health will become the new normal. Passive strategies for interior comfort, ventilation, sunlight and humidity will become mandatory for workplaces. Many best practices from the health sector will emerge in the work of architects. There will be materials with improved antibacterial, antiseptic and disinfectant properties, both new and adapted.

The cult of productivity has been replaced by a cult of health care, both physical and mental. The pandemic has accelerated digitalization, and the topic of sustainable development and conscious consumption has entered a new stage of development. The vector for the development of office spaces will be such phenomena as the fight against pollution, crowding, and a more careful attitude to the distance between people. Increased attention is paid to the aesthetic component of the environment.

The practice of designing office spaces in Russia is particularly active, starting with the 90s of the last century. With the rapid development of business activities, modern office architecture principles started to form. In this process, the peculiarities of development and modern trends borrowed largely

from foreign experience played a significant role. Office spaces (OS) are designed for the R&D and management, as well as the production of information in all known sectors of the economy: public, commercial, non-profit. Particular attention today is given to architectural ecology and creation of comfortable and safe working conditions for all participants of the work process, which largely determines the effectiveness of the company as a whole. The principles of formation of a modern office space can be characterized as "transparency", involvement in the work process, a place for communication, democratic management, interaction, diversity, modularity and flexibility of space, ecological culture. At the same time, the functional-spatial structure of the office largely depends on its status, class, technological processes and working relations, which in the end is determined by one or another type of organizational (corporate) paradigm (culture) according to the system proposed by L. Konstantin [1-3]:

- closed organizational paradigm assumes a strict hierarchy of power with a clear distribution of functions and "conformity" of employees with the undesirable feedback;

- open organizational paradigm is focused on cooperation, assumes a sufficient degree of adaptation for work relations, consistency in the distribution of roles and functions;

- random organizational paradigm is focused on individual creativity, non-standard thinking and priority of personal interests of employees, which dictates the lack of a clear distribution of roles and functions;

- synchronous organizational paradigm is built on the principle of unity of goals and values, the coherence of joint activities, based on harmony and tacit agreement, including the distribution of roles.

2. Organization models of office spaces

As a result, the main models of organization office spaces are formed, which directly correlate both with the type of office building and with the functional and planning structure of the architectural object, which refers to the architectural aspects (Figure 1).
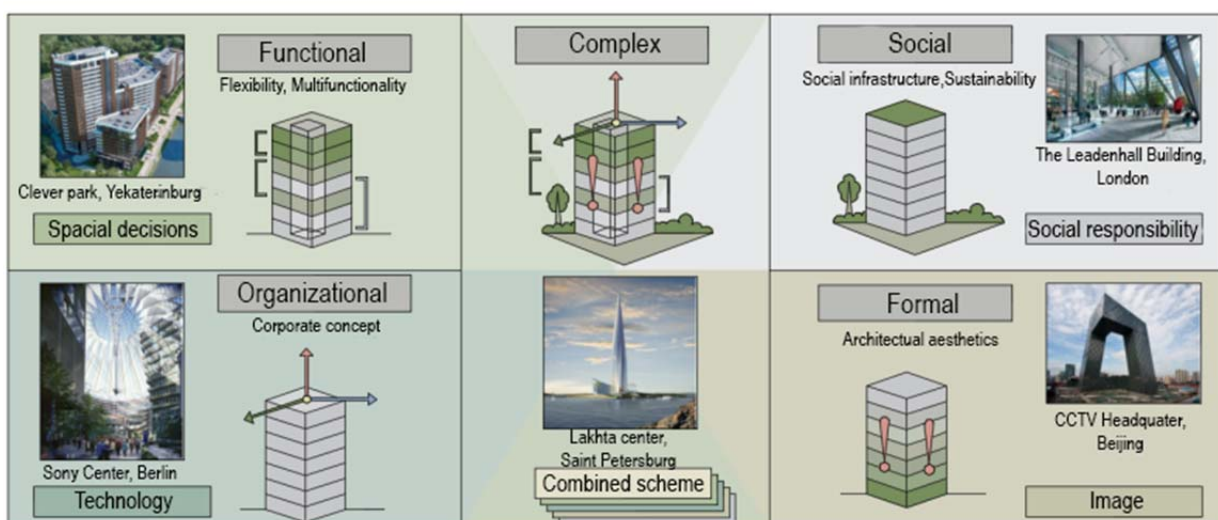

Figure 1. Organizational models of an office space.

The functional model prevails in rental properties, where ease of use, flexibility, technical equipment, architectural and spatial characteristics of office spaces are important. The formal model is

typical for the private offices' development of companies and corporations, where individuality and uniqueness of corporate culture dominate, including in the architectural image of an office. The organizational model prevails in the companies' own offices, where the systematic communication of employees and the optimal conformity of architectural solutions to the workflow are important and addressed by technical solutions. The social model is typical both for the companies' own offices and for the objects intended for rent, the main parameters are the creation of urban culture (openness), environmental friendliness, and the implementation of social responsibility. The complex model combines the most promising qualities of previous models and is a combined scheme, the choice of techniques and means of its implementation is taken into account individually for each office space [4-6].

According to the organizations' culture and its model, architectural preferences are represented in the choice of types of office spaces (offices of different occupancy, group office or combi-office, open space, atriums, coworking spaces, zones of negotiations and informal communication, etc.) compositional planning schemes, image of the building.

3. Basic rules for shaping the environment

Modern office design is based on two basic rules for shaping the environment: HIP - human integration process and HOP - human oriented planning [7]. These rules should also be applied taking into account the specific type of OS, its organizational culture and the corresponding organizational model. The process of designing an office space should be considered from the standpoint of creating a functional, comfortable and safe office environment that would create opportunities for the effective work of each employee. Office activity combines two processes: concentration and communication.

Architectural and planning decisions, the development of a structural plan, the choice of types of office spaces are designed to find a balance between these categories, taking into account the type of OS and its organizational culture. Taking this into account and the basic rules of HIP and HOP, the processes of finding solutions should be organized according to the principle of participation of the customer and the architect already at the stage of idea discussion and problem identification, which will lead to the creation of an effective working environment and consequently to effective activities of the company. "The architectural concept of organizing a workspace is a structure that takes into account both the functional aspect, as well as the psychological component, which forms the understanding and perception of the corporate culture by employees. Therefore, the designed architectural space must include specific features that take into account the implementation of the company's business philosophy. Thus, the concept of workspace organization can be defined as one of the means of conveying organizational values and culture" [8-9].

4. New concepts of office organization

The reality of our time has made radical changes in the development of the architectural aspects that will reflect the organizational culture of the company: today, in the conditions of a pandemic and remote work, both a traditional static and an open office are less preferred to other forms of workspace organization, although their drawbacks (lack of privacy, disruption of the workflow, problems with concentration) emerged even before the pandemic. According to analysts' forecasts, traditional offices will find themselves in crisis, especially after a "smooth" exit from the lockdown state, after which new interpretations of the previous formats in the organization of the workflow and, accordingly, the workspace will be required:

- the concept of a hybrid office has become widespread - as a combination of the traditional office and remote work format for employees (from home, coworking, etc.), the concept is not new but became relevant during the Covid-19 pandemic in the context of a gradual return to offices;

- the flexible office concept, organized in the format of a universal space capable of floorplan transformations, in the form of installing glass or wooden non-stationary partitions at a height

of human height, acoustic screens in rooms for 2 - 3 people, which will ensure safety, preserve the integrity of the space and the possibilities of the future transformations;

- redistribution of functional areas, including reallocation of some work spaces to recreational areas.

The hybrid mode has become part of the organizational model of many types of OS, regardless of the specific organizational culture. "According to surveys, in Russia at the moment about 45% of employees are already working in hybrid mode, while the ratio of working hours in the office/home is 25/75. Much depends on the area of employment and the role of the employee, but in the IT sector, we can safely say that 60% of specialists are maintaining a "hybrid". In general, employees, who switched to this model, rate its comfort at 7-9 points out of 10 ". [10]

The flexible office format for organizing office space has long been taken into account in the design of office premises, thanks to the capabilities of modern technologies. But these are not workplaces in a shared space, which is typical for the layout of some types of coworking spaces. These are separate premises ready for the arrival of a specific tenant with taking into account his needs (offices or open plan, the number of meeting rooms, public areas) and a reflection of the corporate culture brand. The benefits of a flexible office enable architects to define and companies to control the density of employees in workspaces, which is also essential for their health, well-being and well-being, especially during times of pandemics.

A flexible office implies flexible lease terms, which also requires space re-planning. The ability to adjust the number and size of planning modules, for example, to increase the social distance between desktops, turn an open space into a conference room or divide it into individual office spaces, the ability to fence off an additional meeting room. In this case, the principle of "build-to-suit" applies - the office is designed in accordance with the requirements of a specific tenant, the characteristics of the organizational model and the corporate culture of a particular enterprise.

"The lessons from this unprecedented global experiment will enable companies to re-invent the very essence of work, the way of doing and the role of office spaces," McKinsey experts write in their report " Offices and Workspaces Beyond COVID". They expect that in the future, flexibility in office work will open up new opportunities for companies to find talent, make work more productive, corporate culture stronger, and rental costs efficient. [11].

It is important to note that the need to optimize costs and efficient use of space dictates a revision of the principle of organizing office spaces in favor of a flexible model and agile approaches (agile is a set of flexible project management methodologies), not only among tenants but also in large corporations with a closed corporate culture. In this case, a partial revision of the principles of the company organizational culture could be expected. In the long term and in the context of a pandemic, the trend of relocation of service centers to "peripheral business centers with a lower rate and a more convenient location for employees living nearby" is already predicted [12]. The possibility of introducing workplaces into the office space according to the hot desk principle is currently being considered not only by medium-sized companies but also by large businesses (Figure 2).

Workplaces that are not assigned to a specific employee, whose professional activity does not require a constant presence in the office, turned out to be the best solution for the employer: the space in the classic hot desk is 4 - 4.5 sq. m, which is less than a workplace in an open space; the place is equipped with a smaller table without a stationary computer; there is no need to store documents and personal belongings in the office (employees are provided with locker sections for storing things). With such an optimization of the space, in order to avoid discomfort at a high density of space utilization, it is supposed to load the area by 50-60%. According to experts, "the concept of future offices will become more flexible and free, and the figure of 12-14 sq.m of common office space per employee will cease to scare employers. If the coworking market begins to develop more actively and more projects with an area of more than 3,000 - 5,000 sq. m will appear, then a metropolitan tendency will appear in St. Petersburg: large companies will consider coworking spaces for their offices. Thus,

they will save on the organization of office space, and, if necessary, will be able to reduce the number of works spaces" [12].
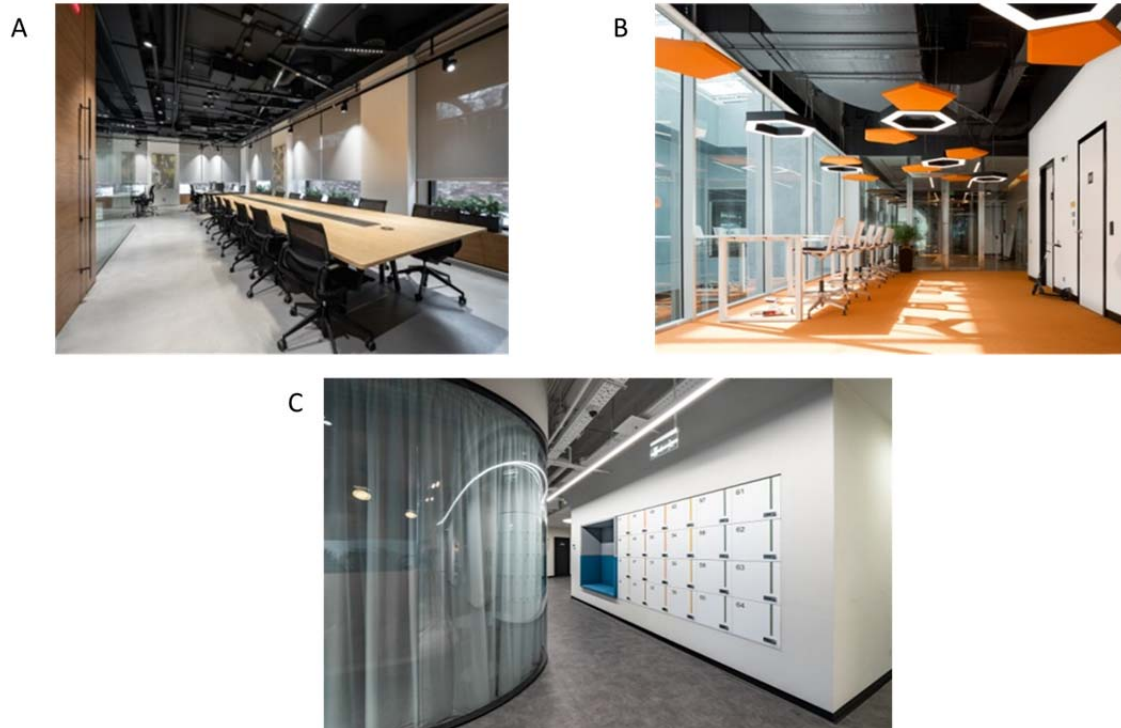

Figure 2. Types of "hot desk" offices:
A - classic, B - without stationary computers, C - lockers for storing personal belongings of employees.

Nevertheless, as studies have shown, it is not possible to completely abandon work in offices in a familiar space, including public functional areas, for a number of reasons.:

- exchange of ideas, brainstorming, development of strategies and discussion of complex issues, decision-making are possible only with in-person communication in a common space;

- unplanned and unstructured meetings of employees are of great importance for the exchange of information and the development of new ideas;

- in the remote work mode, it is difficult to carry out training for some new skills, this requires communication in the office mode;

- the need for social interaction of employees to maintain the psychological climate in the team, including the elimination of difficulties with the adaptation of new employees in the corporate culture.

The organizational (corporate) culture of the company cannot be maintained only online. It is the architectural and work environment (workspaces, places for eating, resting, general meeting rooms) that determines the model of the office facility organization, and therefore the behavior and interaction of employees. According to Sonic Rim President Uday Dandawate, "It's always about a sense of identity. Each company has its own ideals, services and products. People prefer to be in an environment with which they can identify themselves". [10]

A great example of flexible use of office space is "The Edge", Deloitte's headquarters in Amsterdam, a building with a total area of 40,000 sq. m which was built by the PLP Architecture

bureau in 2015 and is located in the Zuidas business district. This organizational model of office space can be considered as one of the most promising methods of coping with the pandemic. During the design process, cooperation with the Change Management Department of the consulting and auditing company Deloitte was carried out, which aimed to solve not only current problems but to create a certain functional and planning potential to adapt the facility to possible changes in the future. As well, almost all modern energy-saving technologies are used in the building and today this is one of the leaders in this area (BREEAM). In this context, it is worth noting the use of the hybrid office model, which allowed not only to reduce the size of the building but also to increase the proportion of spaces for communication, recreation and business meetings (25%, as opposed to 10% in a traditional office). Within the framework of the corporate culture of this company, its organizational model was formed, taking into account the fact that some employees may be outside the office, for example, at meetings, outings, work from home or even from a cafe, being directly in the building. Deloitte employees can choose a place according to the principle of "activity-based working" [13,14]. The space needed to complete a particular task, from an individual space or "silent room" to an area for teamwork, eating or communicating; use the space on balconies, mezzanines or in the atrium itself; choose tables for working sitting or standing (Figure 3).
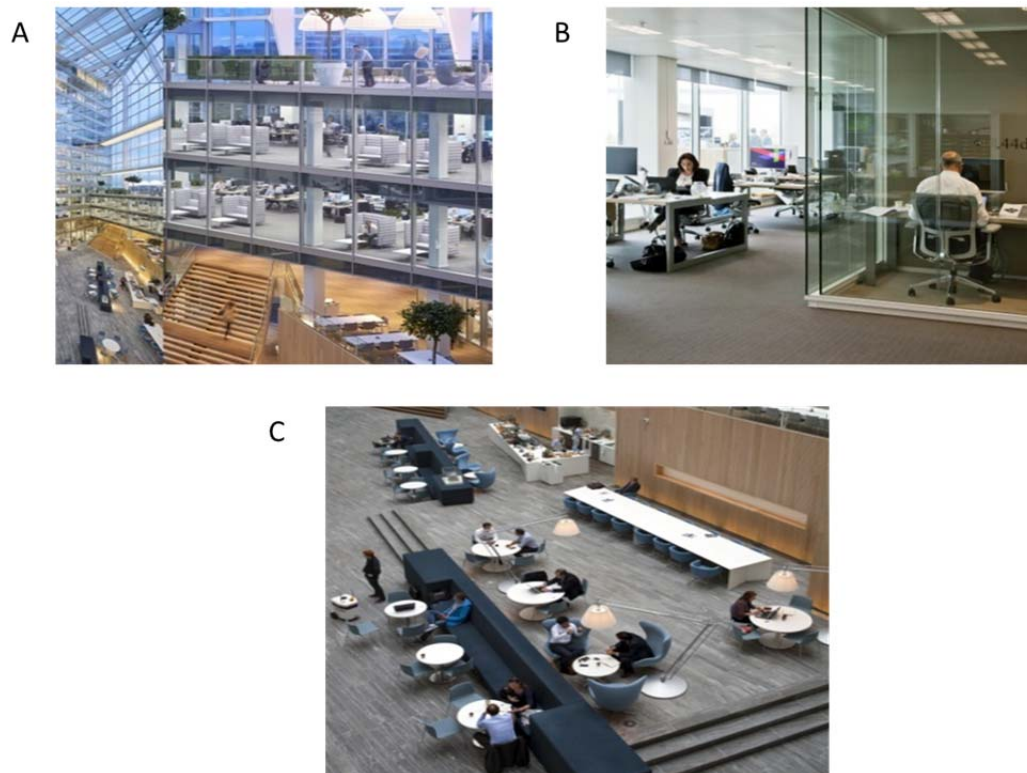

Figure 3. Types of office spaces in "The Edge".

All movements of employees, if necessary, establishing communication with colleagues, information on the availability of workspaces is reflected in the software installed on the smartphone of each employee. The state of the technical equipment of workplaces and the comfort parameters of the internal environment are monitored by a main computer hub.

5. Conclusion
In a modern office facility, a company's organizational culture largely determines its structure and is the basis for creating an effective workspace. During the pandemic, special conditions developed in

the life of society, requiring a revision of a number of principles for organizing workplaces in coworking spaces and, especially in offices, in order to minimize contacts. Compositional and planning solutions, principles of space zoning, traffic routes and functional connections should be revised, which visibility will also be relevant in the post-view period. In the context of this article, these changes largely affect the architectural aspects of the reconceptualization of the organizational culture of office space. The traditional office format is in crisis, new approaches to organizing office space are required. The creation of a "smart" environment should be considered not only from the perspective of comfort and all the regulatory requirements for effective office activities, but the social aspect is also important to ensure the well-being and safety of employees in a pandemic. At the same time, it should be noted what an important role in business is played by spontaneous thoughts and ideas that are born only in the course of live communication, and this cannot be achieved by working remotely. Working from home is not a substitute for working in the office, so the offices themselves must become more flexible, mobile and transformable, more technological in terms of protecting against infections. "Now everyone already understands that life is impossible without an office. Another thing is that its format, function and content will change". [11]

References

[1] Nesmeyanova R K and Lipatov S A 2018 *Features of the relationship between the subjective image of corporate culture and some characteristics of the attitude of employees to the organization: Organizational psychology* (Moscow: Moscow State University Press) p 122–142

[2] Boros S, Curseu P L and Miclea M (2011) Integrative tests of a multidimensional model of organizational identification *Social Pychology* **42(2)** 111–123

[3] Rioux L and Pignault A (2013) Workplace attachment, workspace appropriation, and job satisfaction *Psyecology: Revista Bilingüe de Psicología Ambiental — Bilingual Journal of Environmental Psychology* **4** 39–65

[4] Vartapetova A E 2010 *Architectural and planning principles for organizing office objects*: special 05.23.21 Architecture of buildings and structures. Creative concepts of architectural activity (Moscow: Moscow Architectural Institute Press) p 27

[5] Ronen S and Mikulincer M (2012) Predicting employees' satisfaction and burnout from managers' attachment and caregiving orientations *European Journal of Work and Organizational Psychology* **21(6)** 828–849

[6] Gelfond A L 2018 *Architectural design of public buildings* (Moscow: INFRA-M) p 368

[7] Rotter J B 1966 Generalized expectancies of internal versus external control of reinforcements *Psychol Monogr.* **80(1)** 1–28

[8] Pushkina N A 2019 Architectural aspects of interpreting the company's corporate culture *J. Innovation and investment* **3** 321–324

[9] Schrodt P (2002) The relationship between organizational identification and organizational culture: employee perceptions of culture and identification in a retail sales organization *Communication studies* **53(2)** 189–202

[10] Hybrid workplaces: how the office will change after the COVID-19 pandemic. https://ipmatika.ru/press/news/47057/ (Date of the application 20/04/2021)

[11] How to reinvent the office. Coronavirus epidemic is changing office spaces. https://www.vedomosti.ru/partner/articles/2020/11/06/845504-virus-povishennoi (Date of the application 27/06/2021)

[12] COVID after: how will coronavirus change the office market? https://nsp.ru/1815-covid-after-kak-koronavirus-izmenit-rynok-ofisov (Date of the application 14/04/2021)

[13] Frolova N 2016 Office of tomorrow *J. Architecture ECO* (Aug 18) https://archi.ru/world/70121/ofis-zavtrashnego-dnya (Date of the application 08/05/2021)

[14] What is the office of tomorrow 2021 *J. Kommersant (June 16)* https://www.kommersant.ru/doc/4858353 (Date of the application 20/07/2021)