

Classification Features Of Administrative And Office Buildings

Uzakbaev T. K., Nurkusheva L.T., Imanbayeva Zh. A., Ishodzhanova G.R., Chiknoverova K.V.

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Abstract

The article focuses on the historical regularity of public buildings and structures, the concept and content of office centers, coworking centers, their dependence on the socio-political structure of States, the growth of business, the perfection of the legislative framework, economic growth and population growth of large cities. The article deals with the history of urban planning formation of functional and planning infrastructure of urban spaces in the context of financial and economic development of public areas, from the position of typological classification of modern office and business centers.

Keywords: office buildings, business parks, office centers, concepts of office centers, functional planning organization of financial and administrative buildings and structures, design features of buildings of financial structures.

Introduction

The historical formation of the state apparatus and the radical reorganization of the entire social and administrative system determined the development of new types of different-functional public buildings. In this system, one of the important factors in the formation of financial structures was the formation of the financial and banking system in the history of various States as a whole. This stage of formation of various public functional forms, defined one of the most important tasks, such as the creation of administrative and public and then the formation of types of office, office buildings, banks and then office and banking structures.

For example, the birth of the first financial institutions in Ancient Babylon and Egypt became the prototypes of the first administrative and office buildings. But at the same time, the structure of the Bank's premises in our current understanding, most likely, appeared in Ancient Iraq, which were located in religious buildings. Similarly, in Ancient Greece, large temples had a monopoly on banking: they were first a system of storing valuables for wealthy people and gradually moved to a complex system of usury.

At a later time, commercial banks, more close to modern ones, began to appear in Babylon in the VII century BC and formed as independent public financial structures by the end of the VI century BC. Loan agreements, written on clay tablets, were compiled and stored in these buildings, which became the prototype of modern types of administrative and public financial structures. It is known that there were quite a lot of defaulters: the Babylonians, as a rule, destroyed the tablet with the record of the loan, if the debt was repaid, so dozens of preserved tablets testify to those unfortunate? whose property and goods were confiscated. It is not surprising that banks owned or held mortgages on most of the tangible and intangible assets and occupied a special place in the administrative structure of the country. Historical evidence suggests that, for example, the Babylonian Bank of Murashu ceased to exist only by a special decision of the Persian government in 417 BC.

At the same time, the most sophisticated banking system of the Ancient world was created a few centuries later under the Ptolemaic dynasty in Egypt. The network of Royal banks, which served thousands of clerks, spread throughout the state, the management was carried out from the main office in the capital of Alexandria. In the center of each district there were provincial banks, and even local branches in small towns. This state banking system performed three main functions: assistance in collecting state taxes and revenues, accepting monetary deposits from the population and issuing them on demand, and finally, currency exchange. Thus, buildings and premises for this type of public buildings did not have a permanent functional and structural characteristics and therefore underwent modifications.

Results

The emergence of office buildings is associated with the development of state structures and office activities of office employees. The first "offices" in the XVI century were exchanges. They were

characterized by a pronounced combined planning structure with a Central hall space surrounded by galleries.

Functional zoning meant placing on the first floor of retail stores, on the second-the exchange hall and offices of brokers. At that time, the exchange fulfilled, in fact, in addition to the office, also a public purpose. Archival records of the stock exchanges of Antwerp, Lyon and London show that on average there were 20-30 square meters of space per office worker. However, about half of the space occupied by the library, archive, safes.

In the course of development of history, already at the end of the XIX century, office buildings consisted of specially built office space, designed for about twenty meters per person, and of rooms of 2.5-3 sq. m. in the middle of the XX century, these rooms were also called in the common people "rat holes" because of the increasing number of employees in offices. Cubicle (eng. cubicle) - space for work in the office, cubicle – this is one of the first definitions of office space. Over the past hundred years, this type of building has constantly undergone changes, due to the fact that the functional and planning structure of office buildings has changed.

At the turn of the XIX-XX centuries began the formation of a new type of human activity-business entrepreneurship, ie, work that brings money. At this time, it became clear that this kind of activity everyone can practically do. Under the word business began to understand the business that brings money. For business at all times were necessary special buildings, for example, in 1559, Cosimo I de 'Medici decided to gather all the administrative offices of Florence under one roof called "Uffizi", which translated means "Offices". Originally, the famous Uffizi Museum in Florence was built as an office building. [1].

History has shown that the views of the progressive Medici were ahead of their time, because in the middle ages economic conditions were not yet ripe for a single grouping of forces in business, as in the conditions of capitalism. In the era of capitalism, a person engaged in business, was called a businessman, and the place where he works, was called an office, and the building where the offices of many businessmen-business centers (hereinafter BC) [2].

Today BC for post-Soviet countries is a new type of public building, but identical as in capitalist countries. BC is built as an independent stand-alone building, but also BC are located in multi-functional complexes, hotels, cultural and entertainment, shopping buildings, but mainly, they are formed by area in small, medium, large and largest BC. BC is classified by class. The largest BC in the XX-XXI centuries began to form in the international business center. Financial centers that are located and concentrated in the most prestigious areas of the city, forming independent urban development business zones, called Business city (hereinafter B-city or BS). For example, such as downtown in the United States, Docklands town in London, defense city in Paris, Pudon city in Shanghai, Financial city in Hong Kong, Moscow city and others, which are managed by powerful capitals of international business [9].

The first projects in the format of a business Park appeared in the 1960s and 1970s in the United States. The transport revolution that ended in America by the middle of the twentieth century, the ubiquity of personal motor transport, and then the state-stimulated development of the concept of decentralization led to the fact that the appearance of large American cities has changed dramatically. Over time, office complexes appeared in the suburbs, which by a number of criteria differed significantly from the usual high-rise business centers located in the business part of the city. The active development of a new format of office space has led to the fact that business parks, which have, as it turned out, a number of advantages for both tenants and landlords. For the commercial real estate market, they have become a source of a separate type of highly profitable lease. In the future, the concept of a business Park began to be implemented in the UK and Western Europe, where over the past 10-20 years, this structure has become widespread.

Business Park in a classic form, is a large green area in the suburbs, with a complex of low-rise office buildings, United by a common architectural idea, with a rich infrastructure and recreational areas. Business parks in the near and far abroad are completely separated from the city and independent. They have their own engineering self-support systems. The business Park has all the conditions to ensure that those working here are not distracted from business and do not feel the need to leave the territory of the business Park during working hours. Convenient access roads, high-speed route to the business center of the city, developed public transport or specially organized transfer for clients and employees who do not use personal transport are mandatory.

Currently, an integral part of the architectural appearance of the modern city has become a type of public building "business center". With the development of business and the continuous growth of newly formed companies, in the business arena, there is an urgent need for the construction of modern office buildings that meet international quality standards, which create not only favorable working conditions for employees working in these buildings, but also the image of the entire state [3].

The business center is built as an independent building under construction, but also located in multifunctional complexes, hotels, cultural and entertainment, shopping buildings, but mainly, they have formed on the area of small, medium, large and major centers.

In the countries of the near and far abroad are office buildings, so-called "offices" intended for placement of managements of various firms and monopolies, insurance companies, banks, advertising and other agencies, and also for leasing of premises for purely commercial purposes. The scale of buildings is also varied: on the one hand, these are small structures for institutions with several employees and a construction volume of 200-500m³, and on the other hand, grandiose structures with tens of thousands of employees and a construction volume of hundreds of thousands of cubic meters.

In the post-Soviet space, office buildings of a different type are being built to accommodate the apparatus of state, political and administrative management, i.e. institutions and organizations that manage all spheres of life of the country, ideological, economic, social, etc. Their purpose is diverse: these are the buildings of the Ministry and financial state structures (Fig. 1).

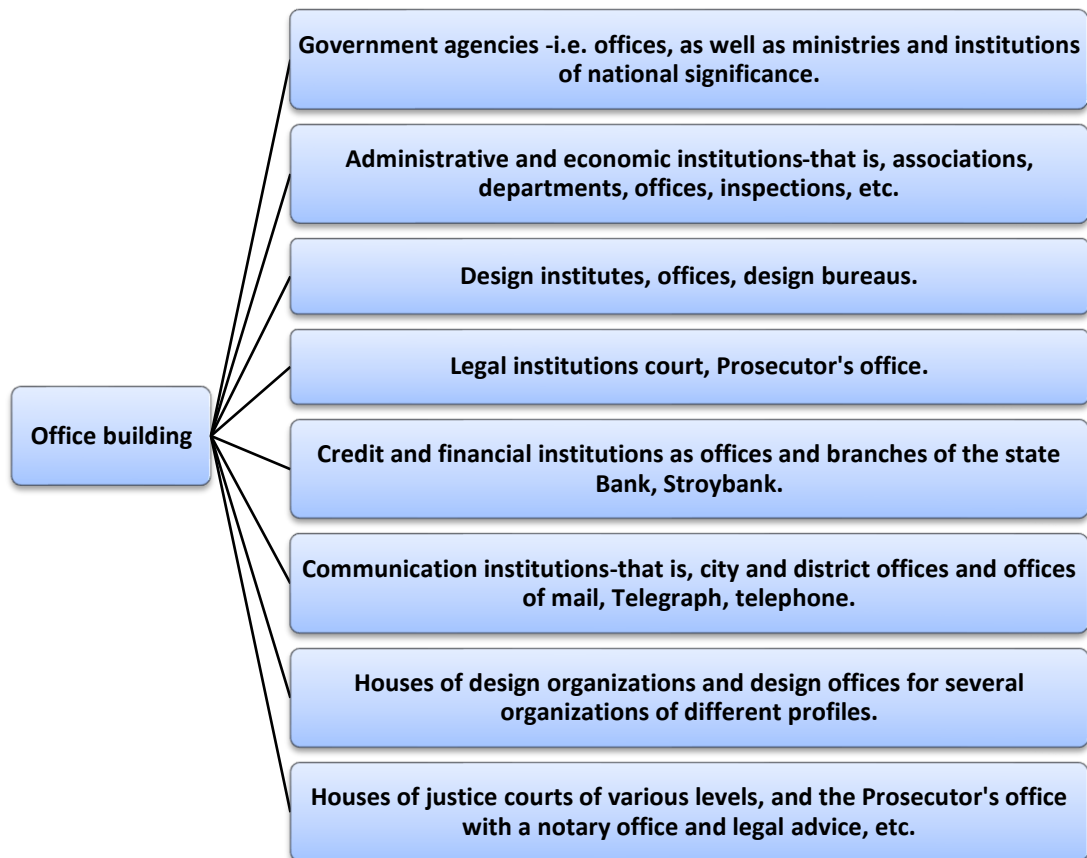


Figure.1 Classification and purpose of administrative and office buildings

Despite all the differences, these buildings share a common purpose: to provide the conditions necessary for the effective performance of management work.

Office buildings-originally low-rise, extended, with rooms located on the sides of the corridor, with natural light and ventilation, arose during the formation of large industrial production and the growth of the apparatus of its management and financing in the second half of the XIX century.

In institutions of this type, a subject-space complex of necessary equipment and furniture has been formed to facilitate the work of staff. The comfort of the subject-space environment is beginning to be modified for specific elements of the subject design. In office buildings, typewriters became a

mandatory attribute, which were later replaced by modern computer equipment. Currently, the formation of internal spaces as a design object is an integral and very important part of the design [4].

By the early 70s, business districts across Europe began to be built based on the principles of complexity and versatility. Historically, in Europe, the location of business centers was formed on a point principle. BC was integrated with the residential and social functions of the city, formed an integrated system and gave the architecture a democratic European character. The only example of a monofunctional high-rise office building was Frankfurt am main, which has developed historically, since the city played and plays the role of a pan-European financial center. Today, it is home to the offices of 400 of the world's largest banks.

In the 80 - ies of the XIX century. with the advent of the Elevator, metal frame and electric lighting in the United States was born a type of multi-storey building, called a skyscraper. And since the 60s of the XX century, the systems of administrative buildings with multi-light interior space were worked out.

Public administrative buildings with a financial and economic management structure are classified according to the types of narrow-profile institutions and structures for which they are intended. They can accommodate one or more institutions or organizations. In the latter case, these are cooperative buildings.

Universal buildings designed for a variety of customer requests are widely distributed. Their layout should allow each institution to organize the internal space of the occupied floors in accordance with their requirements.

For the current stage of building construction management is characterized by: the willingness to be flexible-plan, allowing to transform the inner space according to the fast-changing scientific and technical progress functions and structure of the institution; increasing the number of storeys of buildings, especially those being built in the Central areas of large cities, where it is necessary to make more intensive use of highly landscaped territory transition from the construction of individual objects to the construction of administrative, business and social-administrative complexes that form integral urban ensembles.

The existing classification of business centers, which belong to office buildings, is divided into two categories (Fig. 2).

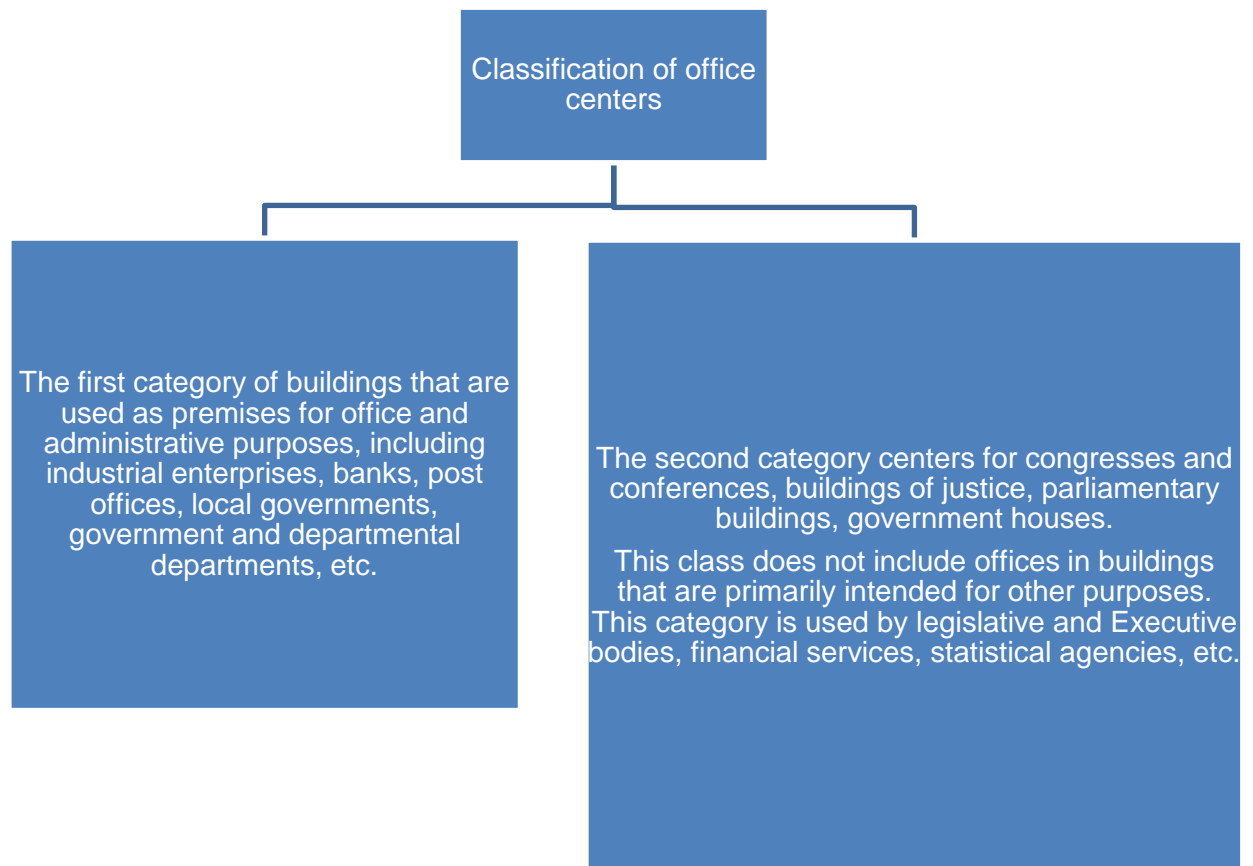


Figure. 2 Classification of the category: "office centers»

Another approach to classification is due to the need to allocate a separate homogeneous group of objects of real estate business. This division is made by quality, size, location of office buildings, and sometimes other typological features.

This classification allows for the design of buildings of business centers to get the expected financial result, since such a project must necessarily be aimed at meeting the interests of the end user, who has certain requirements for the projected object.

Correctly positioned and subject to a competent concept, an office center of a different class becomes prestigious and attractive to customers. The developed classification of office buildings can be applied to new buildings, as well as completely converted (reconstructed) buildings that are of historical or architectural value for the city or already morally and functionally outdated administrative buildings (research institutes and other state institutions) , etc.

It is most convenient to use the established foreign approaches to classification, which traditionally divide office space into four main classes: A, B, C, D. [5].

Type " A " is the highest class of office buildings that must meet the most refined requirements offered by the most demanding tenants. The office building should be located in the most prestigious commercial or financial areas of the city center. It is necessary to have engineering support based on the latest world developments: the most modern examples of artificial climate systems, engineering communications, etc. It should also be possible to operate all the necessary systems in an Autonomous mode, in case of emergency situations in urban networks or scheduled repairs.

The interior decoration of the premises is carried out according to the individual requests of the tenants, and the premises themselves can be equipped with the necessary office equipment and technical personnel. Tenants are offered a sufficient number of places in secure Parking lots, often underground, because urban land in the center has a high cost. In addition, the full range of necessary business and household services is offered.

The company managing such an object provides a high level of technical and cosmetic maintenance of both the building itself and the surrounding area (land). In office buildings of this class, the work of operational services and security is clearly established, and a variety of auxiliary and household services are provided. The main tenants are the world's largest corporations, large financial and banking groups, legal, audit and consulting firms.

Type "B". Office buildings of this class are also located in prestigious commercial or financial areas of the city center. Quite often, office objects of class "A" pass into this category after 5-7 years of their operation. This process is unavoidable due to the constant improvement of standards of service for tenants. Therefore, many parameters of class "A" offices are typical for this class of office buildings. The main tenants are large and some medium-sized firms and companies.

Type "C". This class includes buildings located in areas adjacent to the city center with convenient transport interchange. In some respects, office buildings of this class are similar to objects of class "B". For tenants there are Parking lots, the minimum necessary set of business and household services. Often there are no Autonomous systems of electricity and heat supply. The main tenants are small firms and companies.

Type "D". Office buildings of this class are located far from the center. Engineering communications of such facilities are outdated. As a rule, there are no specialized subsections for maintenance and operation, there are not enough places for Parking cars. The main tenants are small firms that do not yet want or can not rent a more prestigious office.

Type "E". As a rule, buildings of this class are not adapted for placement in them of office premises (premises in non-residential buildings of old construction; premises in administrative buildings, institutes, departmental institutions; basement and semi-basement premises, as well as the first floors of residential buildings). These rooms are undergoing reconstruction according to the requirements of functional characteristics.

Currently, there is no single system of classification of office buildings that meet all the narrowly specific requirements for office structures, since the requirements for them are undergoing changes due to functional and planning system changes, which makes it difficult to assign a class related to the system complex of an office building [5].

The following is an international classification of office buildings, developed for such companies as: "CB Richard Ellis", "Colliers International", "Cushman&Wakefield", "Jones Lang LaSalle" in the development of this classification used world standards in the field of office real estate. The classification includes not only evaluation criteria, but also describes the technical features of office buildings equipment.

When evaluating office buildings, the following parameters are used:

- Engineering systems of the building
- * Structural features of the building
- Lighting
- Parking
- Form of ownership
- Building management

The study revealed that a specific feature of the business center is the allocation in the space-planning structure of recreational and communicative block of premises and spaces in a separate independent functional block, which is located both locally and dispersed in the space-planning structure, performs the ideological and semantic functional load and is a functional space for multi-purpose business building.

In addition to the above-mentioned positions of classification of office buildings, a significant factor in improving the commercial class of business buildings is their certification by international standards for energy efficiency class, which include the availability of engineering systems to reduce energy consumption, the use of space-planning solutions of the structure and shape of office buildings, contributing to their energy efficiency [5].

Logistics and the possible construction of modern office buildings require compliance with new rules and regulations that impose issues such as energy efficiency self-sufficiency that did not exist or were not known before. Someone might ask: why do we need office buildings and office parks in the 21st century, when everyone can work from home, as in "home office" mode? The answer is obvious:

the need for communication and communication, and many people are not able to work from home. Hence the idea of coworking can be an attractive solution for these people. In addition, quite often a group discussion or meeting is required to spark some creative ideas. People are social beings, and the idea of uniting in time in common spaces [6].

Coworking centers, office buildings, various business centers-office objects are one of the most popular categories of spaces in which various professional activities take place. The functional structure of modern office facilities is based on the interaction of working, public areas (with elements of social infrastructure), auxiliary and technical premises. At the same time, the share of public areas is constantly increasing, which is associated with the transformation of the organizational structure of companies and the redistribution of priorities for successful activities. In modern companies, there is a growing awareness of social responsibility – "a company is successful if it creates an urban culture." Fulfillment of social obligations is associated with the development of social programs – educational, cultural, recreational, service, which requires increasing the density of the social infrastructure of office facilities. Increasing the social significance of coworking centers and office facilities is achieved by the appearance of such elements as:

- catering establishments-restaurants, cafes;
- enterprises of social and consumer services-shops, dry cleaners, fitness centers, children's centers;
- business support system – Bank branches, ATMs, notary offices, photo and copy centers;
- educational centers focused on various training programs (specialized, developing, improving skills);
- residential facilities-hotels, apartments, residential blocks;
- cultural and entertainment facilities-cinema and theater halls; multifunctional venues for various events and festivals; exhibition spaces; game centers; walking areas.

By analyzing the evolution of office objects, we can trace a consistent change in the interaction of office objects with the urban environment. Until the mid-twentieth century, open public areas were located outside the territories of office facilities; by the end of the twentieth century, elements of the urban environment were partially "absorbed" inside. The facility itself remained closed, closed to city life, but its structure focused on courtyards, atriums, roof areas, provided cafes, recreation areas and communication for employees. Since the end of the twentieth century. the structure of office facilities provides for public areas of free access-squares, landscaped spaces, cafes. Office facilities are integrated into the urban environment, creating new public spaces. An important factor in the activation of public spaces of business centers is the organization of active functional and advertising outdoor lighting, which inevitably accompanies office buildings as an element of marketing support for the image of firms - owners of office real estate.

The analysis of modern practice of the organization of office objects allowed to allocate 4 variants of placement in them of elements of social infrastructure: integrated, built-in, attached and located separately or specialized.

With integrated placement, the elements of office and social purpose are combined, and ways of their active interaction are provided. Options such integration may be the solution to office accommodation, office+dining office+transportation.

The structure of commercial office real estate is formed by connecting either blocks of various functional purposes, or individual cells-modules, which combine the main functional processes with the requirements of insulation and operation. Such modules can have different sizes and be located in 1-2-3 floors, the Connection of residential and working areas provides continuity and intensity of the working process, creates additional conditions for communications.

When connecting blocks of various functional purposes in the structure of office buildings, the building can be considered as a whole city, which includes various elements, combining the sales office, exhibition space, pre - sale areas of products, conference center, technical and administrative offices, hotel rooms, various recreation areas, children's town, cafes and restaurants.

Built-in placement is distinguished by the separation of elements of social infrastructure from working areas and a clear spatial separation of public spaces of free (for all population groups) and closed (only for office employees) access. Given the security requirements, free access areas are usually placed on the lower floors of buildings, making them part of the urban environment. Elements of the

social infrastructure of closed access can be placed in any part of the building, depending on the adopted composite scheme and solutions of the communication system, and occupy the entire floor (canteens, training centers) or part of it (cafes, recreation areas, vending machines).

For high-rise buildings BC is characterized by vertical zoning, and such placement of communication links that determine the limits of accessibility for each of their functional zones. High-rise buildings are usually divided vertically according to the following principle: the entire vertical is divided into 4 main parts. On the lower floors are open to the city shopping and cultural services, the second group of floors is allocated for banks, the third for offices and the fourth for hotels. The top floor can also be public if the building is very high, there is an observation deck at the top, or the upper floors are reserved for apartments of top managers or penthouses for the elite. Such buildings become centers of not only business, but also social activity for residents of the surrounding areas and the entire city [7].

Conclusion

A distinctive feature of modern urban planning is a dynamic approach to the study of the architectural space of both developing and changing over time object [9].

In the study of the trends in the formation of BC and B-city, external and internal conditions that influence and determine the patterns of its future development were considered. Aspects of its external conditions (socio-political and economic), internal conditions - urban planning, features of BC placement in the structure of major cities, the internal structure of the building itself, features of its architecture and other problems were touched upon. External were considered only for the conditions of Kazakhstan, internal-on the world experience, on the examples of the cities of new York, Tokyo, Shanghai, Dubai, Paris, London, Moscow.

Universal model of a business center as an architectural object in two manifestations of the basic theoretical model regarding the category of space "external – internal", where the business center as an architectural object represents two directions of architectural and spatial development – "business center-building", architectural composition and "business center-interior", the necessary groups of rooms and spaces in other buildings.

Historically, the world has developed two approaches to the construction of business districts: American and European. In the States, the practice of concentrated placement of skyscrapers in the heart of large cities in the Downtowns is common. Downtown (DownTown)-a word used in the United States to refer to the Central part of the city, where there are mainly business facilities or business centers. The term arose because of the need to distinguish areas of Manhattan, one of which, called downtown has a function exclusively office.

In Europe, high-rise buildings began to be built much later than in America — in the late 1950s and early 1960s, by which time a different urban planning concept had developed-integrated urbanism. This term refers to a multi-functional urban environment of high density. This approach made it possible to solve several problems: jobs were provided "near home", and all areas were maintained around the clock-without dead zones.

In the course of the study, the following urban planning zones are proposed for the formation of the administrative and office structure of Almaty development:

1.Commercial office real estate corridor al-Farabi Avenue, initially formed as an integrated interregional financial center;

2.Corridor of commercial office real estate-Dostyk ecologically clean area;

3.The office square includes a "Golden" square and is designated by the streets of Satpayev, Dostyk, rayymbek, and Cosmonauts.

Al-Farabi corridor-New class a office buildings, including Nurly-Tau, Esentai Park, and AFD, located along al-Farabi Ave. This area will be the location of first-class office real estate due to the following factors: large tenants, availability of large land plots, multi-storey buildings, attraction of design companies and property management companies with world renown, higher cost of purchase/rent, sufficient Parking space for tenants / guests, etc.;

The Dostyk corridor – older office building class "A", located in the Northern part along Dostyk Avenue to Gogol street. This area is less preferred due to higher traffic congestion, government

restrictions on reconstruction, lack of available land, limited Parking for tenants and guests. It is characterized by not so high cost of purchase and rent.

In conclusion, we can say that it is necessary to improve the universal model of a business center as an architectural object, taking into account universal criteria that can influence the appropriate classification type of office building. In this case, we can say about detached office buildings and individual business centers interspersed with specific narrow-profile interior office centers inside. It is revealed that a specific feature of the office center is the allocation in the space-planning structure of recreational and communicative block of premises and spaces in a separate independent functional block, which both locally and in the form of dispersion in the space-planning structure, performs the ideological and semantic functional load and is a functional space for multi-purpose business building.

References

1. [1]. About the office and ufizzi. History of one root. Previously published in the journal "Capital education"
2. //http://rousseau.livejournal.com/263322.html
3. [2]. Medici Ricardi
4. //http://skyscraperpage.com/diagrams/?buildingID=7787
5. [3]. "Green" business centers-eco-friendly development Ann Frey, Natalia Kovalchuk // http://www.kursiv.kz/arhiv/nedvigimost-arhiv/1195201129-zelenye-biznes centuries-jekologichnyjj.HTML
6. [4]. Nurkusheva L. T., Imanbayeva Z. A., Karpechenko O. O. "designing an object structural element from the point of view of utility", international journal of applied engineering research, Volume 10, issue 20, 2015, pp. 41032-41037
7. (Article) Research Publications Of India.
8. https://www.scopus.com/record/display.uri?eid=2-s2.0-84978945309&origin=resultslist&sort=plf-f&src=s&sid=eb1ba6c95eb6b3bd9daa7c7668976a38&sot=autdocs&sdt=autdocs&sl=18&s=AU-ID%2857190299735%29&relpos=3&citeCnt=0&searchTerm=
9. [5]. Gelfond A. L., Business center as a new type of public building: monograph. - Nizhny Novgorod: NNGASU publishing house, 2002. - 130.: slime.; M.: Architecture-S, 2007.-254s., II.
10. [6]. Uzakbaev T. K., Nurkusheva L. T., Sidorov V. A., "leading approaches to planning and construction of modern business parks and office centers", proceedings of the 4th International conference on social, business and academic leadership (ICSBAL 2019), ISBN 978-94-6252-821-5
11. https://www.atlantis-press.com/proceedings/icsbal-19/125921032
12. [7]. Gelfond A. L., Architectural design of public buildings and structures. - Moscow: Architecture-S, 2006. - 280s., II. ISBN 5-9647-0099-3
13. [8]. Types of business activity
14. //http://dic.academic.ru/dic.nsf/business/1484
15. [9]. Nabiev A. S., Nurkusheva L. T., Suleimenova K. K., Sadvokasova G. K., Imanbayeva Z. A., "virtual reconstruction of historical architectural monuments: methods and technologies". International journal of innovative technologies and research engineering (IJITEE) ISSN: 2278-3075, volume-8 issue-10, August 2019 p. 3880.
16. https://www.scopus.com/record/display.uri?eid=2-s2.0-85071283455&origin=resultslist&sort=plf-f&src=s&sid=f403fa59549015c1c397610e43aeff39&sot=autdocs&sdt=autdocs&sl=18&s=AU-ID%2857190299735%29&relpos=0&citeCnt=1&searchTerm=
17. [9]. Classification of office real estate
https://studbooks.net/1777202/ekonomika/klassifikatsiya_ofisnoy_nedvizhimosti
18. [11]. Almaty commercial real estate // http://www.open.kz
19. [12]. Imanbayeva Z. A., Asylbekova A. M., Nurkusheva L. T., Ostapenko I. I., Amandykova D. A., "on the history of studying Museum complexes", Astra Salvensis, volume 6, Issue 1, 2018, pp. 311-320

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20. <https://www.scopus.com/record/display.uri?eid=2-s2.0-85047109849&origin=resultslist&sort=plf-f&src=s&sid=f403fa59549015c1c397610e43aeff39&sot=autdocs&sdt=autdocs&sl=18&s=AU-ID%2857190299735%29&relpos=2&citeCnt=2&searchTerm=>
 21. [13]. Shentsova O. M. "heuristic method in engineering and design as a direction of modern architectural education" // Modern science. 2019. No. 1. Pp. 136-141.
 22. <https://www.google.com/search?q=Shentsova+O.M.+%C2%ABThe+heuristic+method+in+engineering+and+design+as+a+trend+in+modern+architectural+education%C2%BB+%2F%2F+Modern+Science.+2019.+%E2%84%96+1.+%D0%A1.+136->