

Utopia or reality: architectural and urban typologies in the future of cities

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Abstract. The article discusses modern conceptual architectural and urban planning projects. Taking the example of programs for international architectural and urban planning competitions, new architectural and urban planning typological units are identified. For example, urban meal mine, digital colosseum, parking tower, functional bridge, as well as habitat concepts, could be the next step in the development of cities. The projects noted by the competitive jury are analyzed on the subject of which aspects proposed by the participants are utopias, and which can become reality. As a result of the study, a forecast is made of the application of the identified design trends in relation to Russia, as well as recommendations are given on the introduction of such conceptual contests in the context of regional problems.

1. Introduction

The information age allows thinking in other categories, not limited to logical conclusions and an exceptionally rational way of thinking. As Victor Hugo rightly remarked, ‘Nothing is power than an idea the time of which has come’. For this reason, in the last decade, the architectural communities have seen a revival of interest in architectural and urban planning conceptual projects, as evidenced by the numerous international conceptual competitions that have become the laboratory for creating future scenarios. Thus, the architectural and urban projects being developed today at a conceptual level will probably determine the architecture and urban planning of tomorrow. Therefore, it seems relevant to determine the modern trends in design based on the analysis of international conceptual competitions.

The purpose of the study is to identify new architectural and urban typological units that influence the spatial development of the future cities. To achieve the goal, the following research objectives were set:

- Identify new typological units in urban planning;
- Identify new typological units in architecture;
- Give a development forecast to identified typological units.

The theoretical and practical significance of the study is to identify the most progressive trends in architectural and urban planning, which can be incorporated at the design of today's projects.

2. Methods

The methodological basis of the study was the provisions of domestic and foreign architectural competitions. The research information base includes competitive programs, results reports, research



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articles on research topics, and Internet resources. The study used various scientific approaches: the method of logical and comparative analysis, the method of statistical analysis, the method of scientific abstraction, graphoanalytical method, historical-evolutionary method, and the cognitive method. The identification of the main promising architectural and urban typological units allowed determining the development directions of not only conceptual, but also design activities.

3. Discussion

Traditionally, architectural and urban planning competitions provided an opportunity to demonstrate innovative ideas to the professional community. It is thanks to the victory of Filippo Brunelleschi in the architectural competition that the dome of the Cathedral of Santa Maria del Fiore appeared. The Paris Opera by Charles Garnier, the Pompidou Centre by Richard Rogers and Renzo Piano, the pavilion of the Soviet Union at the International Exhibition of Modern Decorative and Industrial Arts in Paris by Konstantin Melnikov (1925) were implemented in the same way. At the same time, unrealized competitive projects also sometimes leave a significant mark in the history of architecture – projects for the competition for the construction of Narkomtiazhprom Building, as well as the competition for the design of the Palace of Soviets. Thus, creative contests in architecture and urban planning are more than a tool for finding the best solution for future implementation; an equally important function of project contests is to stimulate the development of innovative proposals.

The organizers of conceptual contests are looking for projects with an unconventional approach, ‘explosive’ solutions to actual problems. Some of the competitions are experimental platforms for young thinkers to express their views on the future of society, such as international architectural competitions organized by ideasforward. Some of the competitions were created with the aim of promoting creative ideas and innovations in architecture, stimulating young professionals to search for new solutions developed in response to changing life realities. In order to achieve these goals, an interdisciplinary approach is required, which will help to go beyond standard solutions. In this case, interdisciplinary teams often use the capabilities of areas such as robotics, mechanics, digital technology, biotechnology and others.

Among the leading organizations that provoke the search for exceptional solutions to modern global problems facing humanity in the 21st century and seek to change the situation, it is worth noting ‘Rethinking the future’. The task of such and similar competitions is not just the search for innovative solutions, but also a critical rethinking of existing design approaches, as a result of which such platforms become a source of innovative ideas and views on the architecture of cities of the future. Among such contests is also worth highlighting ISARCH, 120 hours, 24 hours.

4. Urban typologies

Among the category of urban projects balancing between utopia and reality is a series of contests dedicated to extreme habitats. So, the Extreme Habitat Challenge is one of the most unusual contests that open up new opportunities through the implementation of innovative ideas using new construction, visual, software methods through architecture. Due to the introduction of technological and engineering innovations, the organizers provoke the development of architectural thought in areas little known to this moment. The competition challenges unfavorable conditions, adapting, with the help of technology, extreme territories into habitable ones. According to the organizers of the contest, the next step in the future of cities is the creation of a new standard of living in places with extreme conditions. Therefore, participants are encouraged to develop a conceptual habitat (like colonizing a new land) that demonstrates life in harsh conditions, finding a balance between the forces of nature and human capabilities. In the first and second seasons of the competition, the territory between two large cities was chosen, which could be formed by combining large megacities with the help of innovative technologies, for example, hyperloop (New York and Mumbai, Moscow and Vancouver). The experimental sites 800 x 800 m on Ellesmere Island (figure 1 a) and 500 x 500 m in the western part of the Sahara Desert (figure 1 b) were selected as a prototype of the habitat per 1000 people (with the ability to accommodate up to 1000 000 people in the future).

The difficult conditions of the territory dictate the creation of a system of sharing resources and mutual assistance, which encourages the development of the sharing economy. Therefore, in the projects submitted to the competition, the mobile device of urban education and the ability to transform, to adapt, if necessary, to another place prevail [1,2].

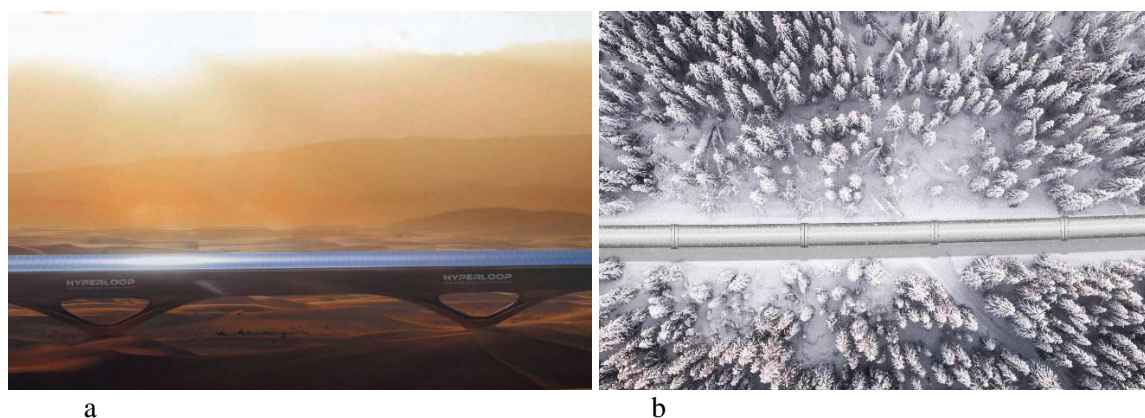


Figure 1. Site for exploring habitat concepts: a – Western Sahara; b – Ellesmere Island.

It is estimated that by 2050 the world's population will reach 10 billion people. The Jacques Rougerie Foundation connects the search for new forms of habitat with innovative and progressive marine and space-related projects. Among the competitive categories, new typological town-planning objects were proposed: underwater and lunar villages.

Lunar Village – autonomous gradually growing housing systems that are independent of the Earth and make the most of available resources in a cyclical economic regime. The competition involves the creation of two types of housing systems: on-site assembled modular structures produced on Earth, or built on-site from materials based on regolith (figure 2 a, c).

The underwater village is an autonomous and self-sufficient community of aquanauts with minimal environmental impact. It is assumed that the structure of the village will include a research center, a hotel, health, sports, cultural and entertainment centers (figure 2 b) [3].

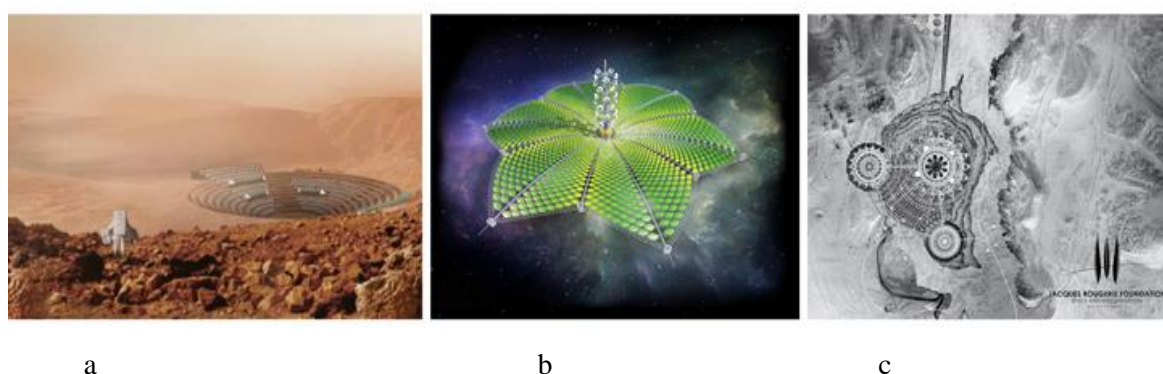


Figure 2. Examples of laureates: a, c – Lunar village; b – underwater village.

Another type of competition is aimed at rethinking the realized utopias of modernism. Thus, for example, the international architectural competition Rethinking the Garden City aims to create the 21st-century garden city projects, a way to bring the spirit of the first garden city to Letchworth. The participants were instructed to adhere to sustainable approaches to design, to respect the existing landscape; focus on the development of walking and cycling routes, the cultivation of local food, in accordance with the original doctrine of the garden city.

As a result, public gardens and markets were proposed that create a positive type of activity (figure 3 a, b). The focus is becoming more accessible to people of all ages.

In common, it is noted that the general trends of priorities in creating public spaces for residents, the synergy between food production, the elderly and children [4].

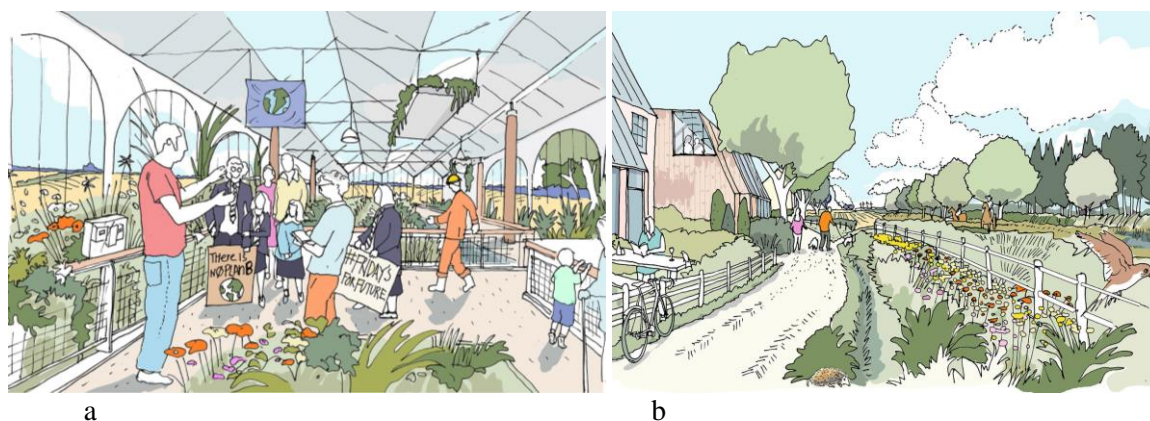


Figure 3. Concept of Garden City 2.0: a – urban farming; b – communal gardens.

5. Architectural typologies

Recognizing that food is one of the most fundamental elements of human existence, Unfuse holds an international architectural contest ‘Urban meal mine’ for the best concept of a multifunctional space for food production. It is a place where people can help grow food for their city. The key point is not the creation of a well-developed facility, but a design program for the point of attraction of residents, demonstrating the convergence of the city and the farm. The new object is a multifunctional structure consisting of markets, culinary workshops, processing centers, storage facilities, coworking. The aim of the project is the emergence of a place where citizens can work together to create a sustainable ecosystem for growing megacities [5].

In the projects noted by the organizers, preference is given to prefabricated modules, minimizing the construction area in favor of preserving land for agriculture. Much attention was paid in the projects to educational activities – increasing the awareness of urban residents in food issues to reduce food losses and a deeper understanding of the food supply chain. Thus, people are beginning to realize the importance of urban agriculture. So, the farm becomes a unique place where people can look at the entire food chain in the city (figure 4).



Figure 4. Concepts of farming: a – ‘Toolset for a City’s Metabolism’; b – ‘We are what we eat’.

The emergence of the following architectural typological unit is due to the ever-increasing passion for computer games. The development of the video game industry is provoking the creation of a

physical space to provide players with specialized digital arenas for e-sports. What will happen to architecture when it becomes impossible to distinguish between virtual and real, and traditional sports give way to e-sports? Are physical spaces ready for the moment when the game goes beyond the screen into a real urban space? The architects and designers are encouraged to reflect on these and other similar questions by the organizers of the international architectural competition 'The Digital Colosseum. Future of eSports in architecture' [6].

The creation of the other typological unit is due to the tradition of cycling around the world. Biking on the street is the main means of transportation in cities such as Copenhagen and Amsterdam, a symbol of movement towards a sustainable city. The number of bicycles in the city is growing, provoking the development of bicycle infrastructure. The idea of the international architectural competition 'The city link' is to reveal the meaning of a 'functional bridge' for walking and cycling. The organizers suggest that the best design of the inhabited bridge will include public space (a meeting place, cafe, information center, shops), infrastructure for cyclists (parking, workshops, shops), as well as related services (waiting area, storage) . The task is to design a bridge that will not be limited in its absolute function, but will become a locomotive for the formation of architectural experiments [7].

Another type of new architectural object related to transport infrastructure is vertical parking. Based on the example of Tokyo, the most populated city in the world, the organizer of the Rethinking architectural contest suggests thinking, can a skyscraper become a parking lot? The international competition 'Tokyo Parking Tower' aims to create a high-rise skyscraper project in the center of the Japanese capital, where parking will be located. Among the presented projects, the main emphasis was placed on the automatic parking system, environmental friendliness, modularity of the structure, and attention was also paid to the development of the tower as a self-developing structure in the long term for 100 years (figure 5) [8].



Figure 5. Concept of Tokyo parking tower.

In the field of high-rise architecture of residential and public buildings, new typological elements also appear. For example, leading international public organizations dealing with the problems of high-rise architecture – evolo and ctuh – urge architects to explore the relationship between a skyscraper and nature, society and cities. The competitors are invited to consider high-rise architecture through the introduction of new materials, digital technologies, taking into account the aesthetic settings of the era of globalization [9, 10].

The purpose of the competition tasks is to develop new architectural methods to solve the economic, social and cultural problems of the modern city, including the lack of natural resources and infrastructure systems, exponential population growth, environmental pollution and urban sprawl. Taking into account the latest achievements in the field of sustainable architecture, the competition offers to think about the possibilities and perspectives of the coexistence of public and private spaces, the prospects of creating a dynamic and adaptive future community. It is also a kind of intelligence, what is a new-generation high-rise building, what are the historical, contextual, social and

environmental tasks of such mega-structures.

6. Conclusion

After analyzing the work of participants in international architectural ideas contests over the past few years, the following trends can be noted: sustainable architecture, eco-design, new materials, concepts and technologies have become the most important topics in the society of the future [11]. In the era of globalization, when the technological revolution dominates, there is an urgent need to rethink the relationship between the city and man [12].

It should also be noted that architectural conceptual competitions are mainly represented by foreign organizations. Domestic competitions are represented by isolated examples (Luna 2050, Petersburg 2030), despite this, Russian participants in international competitions are regularly marked among prize winners.

Since Russia has a rich history of conceptual architectural thought, the idea contests organized by it aimed at finding solutions for Russian architectural and urban planning issues could become a kind of detonator of not only conceptual, but also practical thinking. At the same time, it could be both utopian projects, for example, experimental settlements on the Moon or Mars, and more realistic construction concepts in extreme conditions, for example, for the northern regions of Russia, as well as project proposals for the strategic development of the territories that have developed in the paradigm of the implementation of modernist utopias of the 20th century, experiencing the challenges of a pluralistic information society [13].

As for the new typological objects in architecture, the era of a separate building as a monument isolated from the surroundings is coming to an end [14]. New buildings, in accordance with the modern trend in design, become a reflection of the city and have to respond to the problems of post-industrial society: unprecedented population growth; mass urbanization; changing of the climate; environmental degradation; social, political and economic changes, as well as the rapid growth of countless technical innovations [15]. Today in order to be at the forefront of these changes, it is necessary to lay advanced solutions in designed objects. Thus, if the planning building is high-rise, then it should connect several layers of the city - the physical urban infrastructure, logistics, green spaces, and also take into account the cultural, architectural and environmental aspects.

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