Tangible and intangible assets of city environment: architecture, city lighting and art aspects

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Abstract. The article discusses tangible and intangible assets of city environment. Modern cities strive to create a comfortable and diverse urban (city) environment. City environment has different elements. The article is devoted to the study of a combination of tangible and intangible assets of city. The city architecture, the city lighting and the art has significant impact on quality of city environment and the image of the city. There is an underestimation of the role and potential of the city lighting in creating attractive image of the city. It is important to find a balance between technical and economic aspects, safety and health, nature and creation of attractive environment enriched by art. The functions performed by architectural objects, city lighting and art can be divided into two groups - utilitarian and aesthetic. Both of them are important for the creation of attractive and diverse city environment. The search for solutions within the framework of sustainable development of the city is directly related to the issue of city lighting in balance with architecture and art. The classification method was used to find out important factors for development of city environment. Also case-study method was applied. The article examines the experience of Kazan in organizing diversity and aesthetic filling of the city environment.

Keywords: city, urban (city) environment, city architecture, city lighting, art, sustainable development, the city of Kazan.

1 Introduction

Urban (city) environment is one of the key resources of city development in social-economic and territorial aspects. The quality of city environment allows, on the one hand, assessing the current level of socio-economic development of the city. Attractive city environment requires financial investments to create and to save the good quality of the city environment elements and also reflects the level of the general culture of the city both in an aesthetic sense and in the ability to maintain the cleanliness, preservation and attractiveness of objects. On the other hand, a high-quality city environment provides comfortable conditions for leisure and work and creates the advantages of the city in attracting creative people, tourists and investors.

From the point of view of territorial development, the city environment is a factor of the formation of agglomeration processes. Since attractive and comfortable city environment stimulates pendulum migration to the core city for the purpose of entertainment, relaxation, pleasant pastime in an aesthetic and diverse city ambiance.

Scientific attention is paid to the issue of the city and the city environment from various points of view: smart city and smart environment; arts (eco-arts) and green economy of the city; the tasks of
public space and enriching the public space by the presence of art; promoting walking in city environments; city open space and mental health [1-5].

2 Methods
The study has taken into account the city of Kazan – the core-city of Kazan agglomeration with population more over 1.5 million people. The city of Kazan is one of the 16 cities of Russian Federation with population over million. The City of Kazan had industrial specialization during XX century and now the City improves of the post-industrial economy and develops different service branch, first of all, tourism and HoReCa. In recent years, much attention has been paid to creating a diverse and attractive city environment. The method of classifying factors of city environment was applied to study the directions of creating a comfortable city. Factors or assets were divided by the nature of origin into natural and anthropogenic, by tangibility – into tangible and intangible. The utilitarian and aesthetic aspects of the leading factors in the formation of a diverse city environment – the architecture, the city lighting and the art – were also highlighted. The case-study method was used in the research to identify the manifestation of these factors in the environment of the city of Kazan.

3 Results and Discussion
The city environment includes material objects of a natural and anthropogenic character. Moreover, it also has a special atmosphere created by intangible factors. These factors are different - from the level of noise and sounds on the street (the sound of a tram, loud or quiet speech, music), smells (culinary or flowering plants) and lighting. The city environment is a complex multidimensional phenomenon that is formed under the influence of many factors. To understand the ways of creating a high-quality city environment, we will resort to the method of classifying its elements. In the broadest approach, all elements of the city environment can be divided into tangible and intangible. Material elements are divided into two groups: natural (landscape, water bodies, flora and fauna) and anthropogenic (buildings, transport, sculptures, infrastructure elements - transport routes, lighting objects). Material (tangible) objects participate in the creation of intangible elements – sounds, smells, lighting – and can also be natural and anthropogenic. The singing of city birds, the sound of waves, the silence of the park, the smell of flowering plants and sunlight form the image of the city, as well as the noise of the eastern bazaar, culinary smells or festive electric lighting.

Table 1. Tangible and intangible assets of the city environment.

| Assets          | Anthropogenic | Nature                      |
|-----------------|---------------|-----------------------------|
| Tangible        | Buildings     | Relief                      |
|                 | Lighting equipment | Rivers, sea, lakes, etc.   |
|                 | Advertising, Souvenirs | Plants and animals        |
| Intangible      | Sounds of transport, noisy markets, etc. | Birdsong, water noise, park silence |
|                 | Culinary smells                  | Flowering plants           |
|                 | Artificial lighting              | Sunlight or natural shade of trees |

Both tangible and intangible factors can be divided into two groups based on a chronological or historical approach – the historical heritage and modern properties and factors. Obviously, over time, modern form which was survived in the city environment become historical one.

However, such a division allows us to identify those factors of the city environment that can be called “basic”. The creating of them did not require the efforts and costs of the contemporary generation. The second groups of factors can be called “developed” and they were created by the modern generation [6]. Obviously, it required certain efforts to preserve its historical heritage from each generation.

Tangible factors create a platform, an arena for everyday life or the manifestation of “an intricate ballet” (“sidewalk ballet”) by Jane Jacobs's [7]. They are also a kind of theatre stage for the
manifestation of both intangible historical heritage and contemporary art and creativity, creating an atmosphere of diversity and high-quality city environment and uniqueness of the place. In turn, the uniqueness of the place stimulates the city’s economy by creating jobs, various local types of businesses associated with staying in the city environment - walks, festivals, events, etc., stimulating the influx of citizens, agglomeration residents and tourists. For example, interest in flamenco generates tourist flows to Seville and distinguishes it from other Spanish cities [8].

The most noticeable influence on the formation of an attractive city environment is the combination of the architecture, the city lighting and the art as contemporary anthropogenic tangible and intangible factors or city environment assets. Obviously, urban infrastructure - transport, engineering, etc. is necessary condition for the normal functioning of the city and underlies the functioning of all types of urban activities. However, the architecture, the city lighting and the art are the most important anthropogenic factors for the visual perception of the city environment and for the creation of the city image.

The functions performed by architectural objects, the city lighting and art can be divided into two groups - utilitarian and aesthetic. In the first case, architectural objects perform the function of placing various types of human activity - work, education, leisure, etc. At the same time, architectural objects are able to create an attractive aesthetic the image of the city, or vice versa, monotonous, boring, negative impression.

The utilitarian function of the city lighting is extension of daylight hours. However, the contemporary cities use the lighting as an aesthetic element to decorate the city or, for example, to create a festive atmosphere, etc.

Art in a utilitarian sense is used as city design, advertising, souvenir products. The cities become a continuation of galleries and venues for placing art objects, conducting art performances, carnivals. This is the aesthetic function of art in the city environment.

Modern solutions to increase diversity and improve the aesthetic content of the city environment are at the intersection of the architecture, the city lighting and the art. Due to its monumentality and durability, architecture sets spatial conditions and boundaries for the implementation of the city lighting and art projects. The city lighting and art can be transitory and this is their most powerful potential for event-tourism. Moreover, the very essence of the temporary creation of original lighting and art in an urban environment is to attract visitors to a particular space in order to enjoy and relax in a new visual space in the context of familiar architecture. From sustainable development point of view, it’s important to solve the problem of energy efficiency and find a balance between the aesthetics of the city lighting and light pollution. Improving the quality of life of people and aesthetic diversity should not harm the environment and human health.

The most important utilitarian task of city lighting is to ensure safety, orientation (navigation) and comfort of movement in the urban space at night. At the same time, modern developed economic countries are interested in saving energy resources and increasing energy efficiency.

The trend of the active use of night time in the post-industrial economy is noticeably manifested in various types of entertainment, both indoor - clubs, cafes, concert halls, etc., and in open public spaces. Open spaces - parks, streets, embankments, etc. - become a venue for street cafes, watching movies, festivals and performances, dance floors, etc. All this stimulates the daily mobility of people and requires the comfort and safety of the pedestrians, public transport and open public spaces at any time of the day or year.

Various aspects of the city lighting from increasing energy consumption, technical characteristics of infrastructure, development of concepts and approaches to the practice of lighting cities, including a dynamic approach to design and others are considered in modern scientific literature, including on an interdisciplinary basis [9-13].

Modern energy campaigns develop projects designed to combine the utilitarian and aesthetic functions of urban lighting while maintaining a balance between aesthetic, economic and environmental aspects. An example is Phillips's project «City. People. Light» [14].

In technical terms, the following steps can be identified for the implementation of such solutions. First of all, this implies a transition from sodium lamps with yellow light to LED with white light.
Such a replacement provides several advantages at once - an economic reduction in energy costs due to lower power consumption and lower operating costs, a more natural look of the environment, leads to increased safety. Secondly, the introduction of modern energy management systems allows you to solve the problems of using various energy sources, including alternatives to electricity in the city network (wind, gas, solar, etc.). It is worth noting that initially the energy management systems of lighting networks came into conflict with lighting solutions for design, communication and urban aesthetics. However, modern lighting design and energy management should only be considered in conjunction with each other [15-20]. The desire to improve the quality of life is closely linked not only means lighting roads, sidewalks and other spaces for safety and transit [21-24], but also aesthetic pleasure, obtaining exactly the type of lighting that most distinguishes urban permanent and temporary objects – architectural and art [25]. Thus, a modern comfortable city environment is formed by a complex combination of the architecture, the city lighting and the art. Such combinations are temporary or seasonal in nature, which brings diversity to the everyday life of citizens and creates conditions for attracting tourists and residents to cities, as well as creating flows of pendulum migrants of a seasonal or event character and strengthening agglomeration processes.

4 Case study of the City of Kazan

The city of Kazan has over 1.2 million people and 1000-year-old history.

Kazan had industrial specialization throughout the 20th century and the quality of the urban environment was determined by the general requirements for cities in terms of planting of greenery, lighting, landscaping, etc. The beginning of the 21st century, on the one hand, was characterized by the decline of certain types of industry - the closure or removal of enterprises outside the city, and, on the other hand, by the active growth of the service economy. In 2006, the largest water park Riviera opened in the city, attracting a significant number of tourists and citizens, residents of the agglomeration, the HoReCa sphere, clubs, ice rinks, street performances began to develop actively, new galleries opened, etc.

Along with the growth of the tourist flow, the demands and interest in creating the city environment saturated with various aesthetic objects have increased. Against the background of architectural objects of the historic city center, temporary projects are being carried out at the intersection of lighting and art. Today Kazan has already gained some experience in creating a variety of the city lighting and art installations in the city environment. Among the most interesting examples of the combination of the architecture, the lighting and art as elements of the city environment, it should be noted the lighting of central streets and the ice rink on New Year's holidays, the “Carnival of Neural Networks”, the festival “Media-art in the Kazan Kremlin”, New Year's lighting decoration of the main street of the city was made by the Italian company Festi Group [26].

Figure 1. New Year's lighting at Bauman St. (2019-2020) (photo by R. Khusnutdinov).
Festi Group organized more than 3.4 thousand performances in 415 cities in the world. In Kazan, they decorated Bauman's pedestrian street and the embankment of Lake Kaban.

![Image](image_url)

**Figure 2.** “Carnival of neural networks” (2018) (photo by G. Fayzrakhmanov).

“Carnival of Neural Networks” – installation of the Voronezh artist Ivan Gorshkov forms three large bright inflatable sculptures, the highest of which reaches a height of 4.5 meters. This is a unique innovative practice of creating objects for the city environment: on the fabric from which the objects are created, images were obtained using open-source software for creating neural networks – Image to image and Deep dream. By uploading dozens of images found using the Energy tag, the artist received a variety of patterns from lightning, explosions, induction patterns, and volcanic eruptions. The sculptures became a collective image of all types of energy, including creative (figure 2).

![Image](image_url)

**Figure 3.** “Cube-Ka’bah-Cube” by A.Lazarev (2013) (photo by G. Faizrakhmanova).
One of the first wooden art objects made in actual style was the “Ka’bah-Cube”, erected on the territory of the Kazan Kremlin Museum-Reserve as part of the “Night of Museums” campaign in May 2013 (figure 4). The author of the project is a graduate of KSUAЕ, architect Aleksey Lazarev, and the accompanying design is students of KSUAЕ Anna Naishul and Maria Agafonova. The authors of the project did not choose the shape: the cube is an ideal geometric shape, it was embodied in their works by French cubist artists, Russian avant-garde artists. “Cube-Ka’bah-Cube” is also a three-dimensional screen metaphor, taken from the Hermitage-Kazan Center to the Kremlin’s space as an image of the Club 20/21 lecture and exhibition program, aimed at educating the Kazan audience in the field of contemporary art and architecture. After dark, the cube acted as a luminous object and on one side of the cube were projected non-stop videos of Yekaterinburg artist V.Seleznev (“Immersion” and “What comes from nowhere and goes nowhere”). The soundtrack for the video was written by Alexander Sitnikov and Nikolai Babak – participants in the electronic project "Four Positions of Bruno" (Yekaterinburg). The project “Cube-Ka’bah-Cube” was awarded the prize “Choice of the people” in the nomination “Art object” of the architectural prize “ARCHIWOOD-2014”.

![Figure 4](image.jpg)

**Figure 4.** Performance of V. Seleznev (2009) (photo by G. Faizrakhmanova).

Performance of the VJ-show artist Vladimir Seleznev at the musical accompaniment of the electronic group “4 Bruno Positions” from Yekaterinburg in the framework of the festival “Mediaart in the Kazan Kremlin” in May 2009 (figure 4).

**5 Conclusion**

Thus, the formation of diversity and aesthetic fullness of the city environment reinforce its qualitative characteristics and make it more attractive for citizens and tourists. The variety and aesthetic characteristics of the environment of modern cities are formed on the basis of a combination of tangible and intangible assets. A special role is played by the architecture, the city lighting and the art, not only in a utilitarian sense, but in an aesthetic one. The combination of tangible and intangible assets of the architecture, the city lighting and the art allows to create a unique atmosphere of the city and fill the daily life with eventful events, which becomes an additional competitive advantage of the city in attracting tourists and investments. Case-study of the city of Kazan demonstrates the ability of cities to use both foreign and domestic opportunities, as well as their own resources in creating a diverse city environment based on a combination of the architecture, the city lighting and the art.
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