Research Article

World Journal of Tourism and Management

Design Concept of Multimedia Information Interface of the Urban Environment

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Submitted: 2025, Jul 30; **Accepted:** 2025, Aug 25; **Published:** 2025, Sep 29

Citation: Belov, O. D., Abbasov, B. I. (2025). Design Concept of Multimedia Information Interface of the Urban Environment. *World J Tourism Mgmt, 1*(1), 01-05.

Abstract

The paper deals with the design of an urban information environment using interactive media complexes. The provisions of the design-projection of the subject-spatial, informational environments, their relationship with the mental and social components of the subject of the environment have been studied. On the basis of the identified features, the concept of a system of interactive multimedia media complexes that form an integral information environment of the city is proposed.

Keywords: Subject-Spatial Environment, Urban Environment, Information Environment, Conceptual Design, Multimedia Interface, Interactive Multimedia Complex.

1. Relevance of the Study, Problem Statement

Design as a professional activity arose in a historical period in which technologies for the production of material goods changed decisively. Today we call this period the Industrial Revolution. It created a kind of shift in culture: a specific method of influencing the objects of the surrounding world appeared. Now, more than a century after these transformations, humanity is facing a new "step" of civilization - the era of multimedia, digitalization. Further alienation of man from his natural sources, his transformative activity created an anthropo-technogenic environment, the state of which painfully exacerbates the problem of human ecology.

The purpose of this study is to design a system of multimedia complexes based on the principles of spatial design in the information environment of the city. The object of the study is the information environment of the city in its material explication. Subject of research: the concept of an interactive media complex.

To do this, it is necessary to solve the following tasks: to identify ergonomic and technical principles for the formation of interactive media complexes; based on the analysis of the influence of multimedia on human consciousness, design a system of media complexes that form the information environment of the city.

The scientific novelty and theoretical significance of the study consists in conducting a comprehensive analysis of the experience of domestic and foreign practice of organization and the features of the formation of virtual spaces in the urban environment. The practical significance of the study is determined by the possibility of using the developed elements and theoretical theses and principles in organizing the urban information environment. As an example of such an environment, the urban space of the city of Rostov-on-Don is taken.

1.1. Level of Development

The reflection of the basics of designing objects of the information environment can be found in the works on the theory and methodology of design design [1-5]. The issues of formation of the theory and methodology of design and environmental design in multimedia are covered in the works [6-8]. Considering the innovative solution of the features of interaction between multimedia and the urban environment, there is a lack of systematic development of this problem in theory and practice, which determines the choice of the research topic.

1.2. Characteristics of the Subject-Spatial Environment

Most acutely before the practice of design is the question of specific human activity in the environment - development. Mastering the environment, we overcome the initial opposition of man and nature, our own and others. Without such development there can be no environment. It arises when and where there is a development of alien space by a person. This approach makes it possible to understand that it is the environmental situation that becomes the basic object of design here - not only space, but also its meaningful development. Moreover, the elements of such a situation are everything that we are accustomed to consider as elements and factors of the environment, for example, lighting, temperature, evoked emotions and feelings.

However, human behavior in the environment determines not only the factors attributable to this very environment. It also depends on the subject that is in this environment. Among these factors: habits, character and social status of a person, his attitudes and expectations from environmental interaction.

The subject in such a structure acts as the center of environmental organization. Simply put, this is a person who masters his objective environment. Only in the state mastered by the subject any environment can be called exactly the environment. The environmental subject is surrounded by a zone of its direct contacts with the environment, the “environmental core” [3]. For the individual, his environment is represented by everything that he perceives indirectly. But it is precisely such a core that is the basis for creating comfort and atmosphere.

The periphery of the environment manifests itself as it moves away from the environment subject. Usually it is formed by several "layers". Such a "periphery" continues as long as a person has the ability to perceive it. Then begins the subject environment, not mastered by the subject.

Consequently, the structure of the subject-spatial environment is a special system of sequentially located areas that have different properties. Such properties change with the emotional and physical distance from the core [4,5].

2. Design Concept

One of the design tasks is to create the appearance and form of the complex justified by the specifics of a particular city. Only by embedding such objects in the formed environment of the city, one can count on the interaction of these environments. In this regard, it is necessary to pay attention to the already existing aesthetic appearance of the urban space of Rostov-on-Don. By borrowing some elements, it is possible to highlight the specific attributes of a particular urban environment and transform them for use in a complex [2].

In this way, you can create an organic look of high-tech facilities in the historical ensemble of the city. In addition, the foreignness of objects is eliminated and the loyalty of users to them increases. The pennant was chosen as the main associative form. Compositions of pennants and flags have become the main form of transformation of the urban environment from the aesthetic side by the municipal authorities. This form of the complex allows it to be organically integrated into the space of the city of Rostov-on-Don (Figure1).

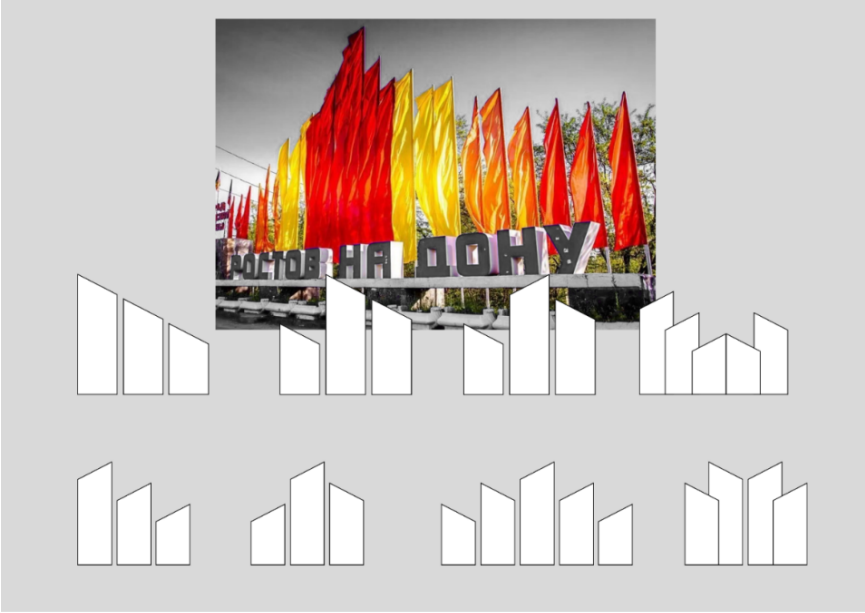

Figure 1: Substantiation of Formation

The designed object cannot be perceived within the framework of a specific isolated complex. Based on the synthetic approach to design, the components of this object will also be "node stations" that ensure the operation of a comprehensive information network, its administration and some issues of user interaction, as well as individual devices that provide individualization of a virtual event.

Such devices may contain basic information about the user (daily routine, the most suitable routes, data on health, interests, data on social status), the instantaneous exchange of which between parts of the information network will provide more accurate and shorter, situational interaction between the subject and the object (Figure 2).

Figure 2: Information Network Structure

Thus, the unity of the three elements of the information network (nodal center, specific complex, individual device) fully delineates the actual boundaries of the designed object: a kind of interface between the user (a citizen in the urban environment) and the urban information environment. Specifying the above, the design object is an information system integrated into the objective world through multimedia and new type interfaces, which is a unified space of virtual events arising from real events in the urban environment.

2.1. Ergonomic, Urbanistic and Ecological Characteristics of The Complex

For aesthetic design possibilities, the main ergonomic functions will be assigned to the hardware and the interface - it will itself adapt to the height, age and other ergonomic indicators of the user, through the use of motion capture and spatial analysis technologies. The task of designing here is to set such flexibility of the system within which it would be possible to change ergonomics while remaining in a single spatial form. The brightness of the glow, the intensity of the colors will be adjusted depending on the lighting (due to photovoltaic sensors) and individual vision characteristics (contained in the medical card on the individual device).

Of particular importance here is the issue of data confidentiality, privacy. It is necessary to clearly distinguish between the data that the user shares from those that he considers confidential. Now society is entering the era of "big data", when information systems daily collect huge amounts of data about users in order to optimize certain processes, but so far the emphasis in this area is on commercial processes. In addition, the vast majority of the population negatively assesses such methods of collecting information. The question arises about the appropriateness of these methods for the social sphere.

On the one hand, every person has the right to privacy, on the other hand, the "optimization" of urban space is impossible without analyzing data arrays about citizens. The solution to the problem lies in a clear and specific notification to the user. It is necessary to indicate who collects the data, some information, why the collection is made and what methods of data protection are used. Based on the current situation with data privacy, users are willing to share personal information of any kind, only if they are confident in the security of its storage and processing. The issue of data security in the projected complex can be solved due to its "extended" structure: personal data is stored only on individual devices (medical data or movement data) and a specific complex does not transmit or store such data, and the nodal complex is provided by data specialists, tracking leaks or anomalies.

It is also important to take into account the urban and logistical indicators of a specific urban environment. The density of the population, its demography - all this is necessary for the specification of the information network. So the geographical location of specific complexes and the junction station should be chosen taking into account the transport and passenger flow at different times of the day. The spatial layout of specific complexes should also take into account the surrounding architectural ensemble [9,10]. It should be borne in mind the peculiarities of the behavior of subjects in this environment, take into account the scenarios of people's behavior in the selected space, as well as their "value cut" (simple, complementary layouts - at stops and transport hubs, more complex, scenario compositions - in recreational areas). Figure 3 shows spatial images-symbols of various layout schemes: arch, threshold, path, turn.

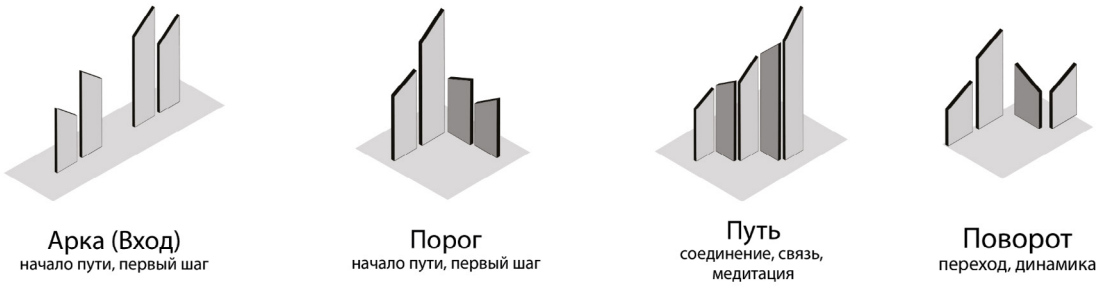

Figure 3: Spatial Images-Symbols of Environmental Layout

An important design task is to take into account the characteristics of a particular city, its appearance, and the shape of the complex. In this regard, it is necessary to pay attention to the already existing aesthetic appearance of the urban space.

One of the main factors to be considered during development is environmental friendliness. With regard to the design object, environmental friendliness will be manifested, on the one hand, in the use of modern materials that do not affect the user through harmful emissions and fumes, and on the other hand, in the absence of excessive noise and light radiation. In modern urban space, it is important to find a balance between manufacturability and the preservation of the natural perception of space. That is why the “transparent” type of complexes was chosen, which solves several environmental problems at once [2,3].

− minimization of light radiation;
− preservation of the urban ensemble;
− absence of "distractions" for traffic participants;
− a step towards the rejection of paper advertising media.

2.2. Interface of The Complex

The interface of the proposed complex cannot be considered as a special graphical expression of the interaction method. Interaction with the complex should reflect the "bodily" perception of the subject-spatial environment, i.e. the complex should be perceived as an organic continuation of not only the urban environment, but also the very essence of the user, expanding his own possibilities of interaction with the information environment. The interfaces of the new generation seem to be the most suitable for this task - at the first stages, voice and gesture, then - mental [9,10].

However, it becomes clear that an interface limited by one way of interaction is not able to become a part of the corporeal world, because the individual interacts with the environment in the totality of ways available to him (voice, gestures, vision, hearing, tactile interaction). In the same way, multimedia complexes of the future will be likened to a person in matters of interaction: use the means most suitable for specific tasks.

Thus, the interface of the complex is seen as hybrid and "organic" - allowing you to set different commands in different ways. Such a differentiated approach can solve many different problems (Figure 4).

So the voice interface is suitable for large text queries and tasks that are not specific to virtual metaphysics (for example, will it rain in the western region today?). Gesture interface is ideal for navigating in the virtual space, flipping and closing pages, selecting options. In addition, such a system solves the issue of hygiene, eliminating the need for touching.

A “tactile” interface is suitable for interacting with an individual device. So, the user can open access to confidential health data only by attaching his device to the screen of the complex.

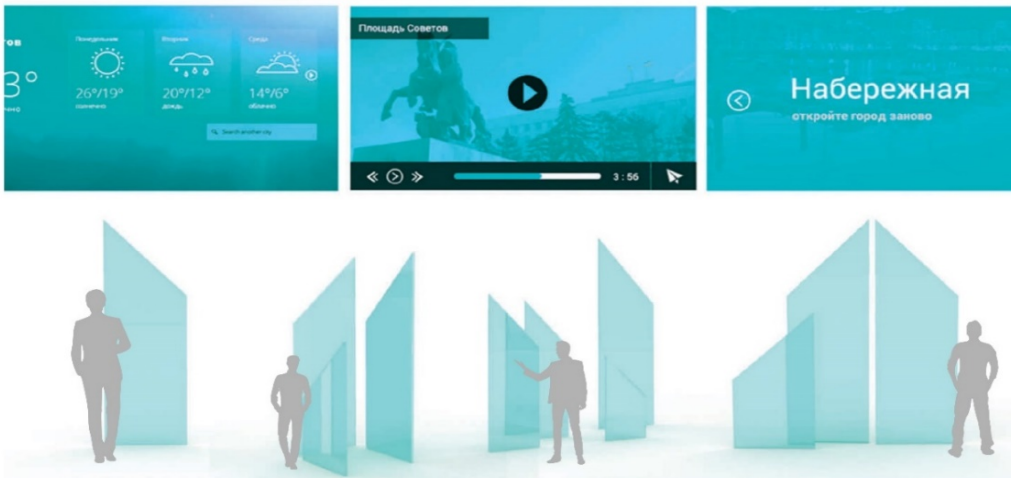

Figure 4: Graphical Interface of The Program

Combining various types of interfaces, it is possible to create an organic system that is close in structure to the “human-to-human” interface, eliminating the media-communication part. Researchers call such interfaces "transparent" - not perceptible to human perception as something independent (Figure 5).

Figure 5: View of The Complex SSSSin A Specific Urban Environment

3. Conclusion

One of the most important tasks of this project was to preserve the cultural and aesthetic reality of each specific urban environment. The proposed design solution makes it possible to take into account these features of the urban space, filling them with new, deeper content. The designed complex is also a conduit that allows the citizen to effectively interact with the information environment of the city: instantly receive, transmit and transform relevant information. For a multimedia system, a kind of “organic” interface was proposed that interacts with a person through various kinds of actions that are most suitable for each virtual situation. In the era of globalization, the system of urban multimedia complexes can contribute to the strengthening of international communication, the expansion of tourism and the preservation of cultural heritage.

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