Technologies for Planning Coloristic Tasks in Architecture

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Abstract - The article explores the meaning and use of the capabilities of color and color combinations in architecture and design in planning interior and exterior spaces. Color is the primary factor of research in the analysis of design solutions in the process of creating an environment. Revealing a variety of coloristic aspects and planning opportunities, the author points out the emerging problems in working with color. The study aims to find environment design solutions with the predominance of color, to create a comprehensive system of design with the obligatory inclusion of modules of coloristic and color planning. Based on the goal, the entire focus of the work is to develop and deepen the concept of color in creating a creative, step-by-step system of architectural spaces. The employed methods are associated with the architect and designer’s understanding of the model of the coloristic organization of a comfortable environment. The methods under consideration are based on the practical implementation of architectural and design projects in life and practical work, in the process of which the main objectives of the study are identified. The study analyzes the artistic and aesthetic features of the organization of space. The results of the study identify new opportunities for planning design solutions using color and the harmony of the color scheme subordinated to the color and coloristic unity of the environment.

Index Terms – architecture, art of color, design culture, design, methods.

INTRODUCTION

Contemporary design culture is among the most serious and challenging problems in architecture and design. It is a special aspect of the design of residential, public, or private environments, which requires a professional focus on the design of the architectural environment and the integrated formation of objects and environment systems in the artistic and aesthetic solutions. The planning technologies have to include solutions for the organization of coloristic and color components of architectural projects. The result needs to be considered in the practical implementation of design ideas. The ideas embedded in the design solutions, which are often aesthetic and decorative elements of building facades, or interior design often remain mere ideas and are not put to life [1]. I.B. Melnikova analyzes the reasons behind the monotony of the facades of modern buildings in Russia. The author proposes to solve the problem with a variety of materials used for decoration and facade cladding. The study also reveals the problem of the inconsistency between the architectural design and the nature of the historical architecture of the city [1, p. 88]. With the growth and completion of construction and the increase in the amount of private housing, the divergence between the aesthetic characteristics of the architectural idea and its final embodiment is rising. Researchers often see the solution to this problem in economic terms. A.V. Popov argues that the focus on creating budget housing, particularly for young people, without excesses presents the solution to the economic problems in construction [2]. As a result, there is a large amount of interior and exterior space that lacks artistic character and aesthetic design objectives. This applies to both established urban areas and areas of new construction. T.E. Trofimova [3] provides an example of the layout and architectural solutions of buildings in the social sphere and emphasizes that the social sphere needs to be comfortable, convenient, and aesthetically pleasing. In her study, the author analyzes the design solutions of transport services of the city of Moscow and, aside from the architectural and construction tasks, considers the aesthetics of comfort and convenience of social architecture. The study is based on the principle of the accessible and, at the same time, comfortable environment through scale planning and proportional solutions in architectural design [3, p. 269].

That being said, the aesthetics of color and the color perception of modern residential architecture is extremely rarely considered. A.V. Efimov [4] explores the capabilities and meanings of fine art in art and stresses the insufficient presence of this type of art in architecture and design.
author points out the influence of fine art on the development of design, as well as the necessity of using this type of art in architecture the need [4, pp. 20, 25]. The problem with the technology for planning coloristic tasks in an environment remains unresolved. The need to address this problem in the field of interior design and decoration in Russian architecture is indicated in the studies of V.D. Uvarov [5].

The concept of aesthetic comfort encompasses color comfort. Furthermore, the opportunity to resolve the indicated problem does exist. It lies not in completely changing design tasks but in combining project solutions with the tasks of design. The present study is aimed at finding solutions in the sphere of color and coloristic presentation of the facades of modern residential and public buildings to improve the situation with the aesthetic component of architecture. The objectives of the study are to create a comprehensive system of design with the mandatory inclusion of color and coloristic planning modules and allocate and analyze the artistic opportunities to create a comfortable environment.

**METHODS**

The study employs the following methods.

**I. Historical research method**

The use of this method is necessitated by the fact that architectural heritage is the source and scientific foundation for design solutions. The historically established rules of space organization are relevant since they have stood the test of time. The historical method has served as a basis for many scientific studies and was used in practice, which has been repeatedly indicated in research, for example, in the study by I.V. Aksenova and E.V. Pervykh [6]. This method was successfully utilized in architectural practice by A.V. Efimov [7], providing the opportunity to preserve the identity and stylistics of urban buildings. Many contemporary construction solutions are based on or use the historical features of the art of past centuries, including architectural plastics, sculpture, and decorative art. The use of this method expands the design possibilities, enhancing the artistic and aesthetic components N.B. Ulyanova [8].

**II. Systemic research method**

The systemic research method provides opportunities for analysis. Furthermore, it can be used in the process of analysis for the identification of problems and necessary measures. This method is actively employed in the reconstruction and restoration of the provincial areas of Russia [7]. Systematization and analysis of historical research and the connection of the studied problem to the modern reality have provided for conclusions with subsequent planning of practical problems and their resolution in the scientific papers by A.V. Efimov and A.M. Iustus [9].

**III. Practical method**

The methods of the practical level are diverse and present the core of research. The practice of architecture and design currently presents a block of practical solutions, which include creative analysis, in-situ studies, and visualization of future facilities, as well as innovative systems for performing design tasks. The main element in the complex of design and artistic ideas is still an applied experiment. Any architectural or design idea must be confirmed in practice, only practical experience leads to correct decisions in architectural practice. Confirmation of this can be found in the works of T.E. Trofimova and A.N. Radionovskii [10], which examine practical work and conclude on the necessity of practical execution and implementation of projects, as well as emphasize the importance of this method [11].

The importance and improvement of the quality of the performed design work associated with the search for coloristic harmonies and the use of decorative elements, such as fine art and decorative art, are noted in the study by V.D. Uvarov [12]. Having systematized practical work, the author introduces an element of planning into creative solutions using fine and decorative art. These characteristics are important in the choice of interior color solutions. Figure 1 shows an example of practical planning of the interior of a living room with a possible color scheme and decorative elements. In each methodological focus of the coloristic tasks of environment design, the participation of all methods of work needs to be considered in combination.
At various stages of the planning of modern design, color becomes a priority. The development of a unified system ensuring the preservation and formation of space for humans depends largely on the color solutions used in it. In this context, it is undoubtedly important to create new design solutions that contribute to the convenience and comfort of human habitation. The choice of the optimal way of planning color systems in the interior depends on the complex and interaction of methods and techniques. The use of balanced color and coloristic architectural details and decorative elements in the design of an environment will help the creation of an aesthetic environment. Analyzing color combinations and relying on the characteristics of modern materials, it is necessary to note the role of achromatic color range with the predominance of gray in all its shades. Applying this principle in practice, it is possible to propose any coloristic scheme. Figure 2 shows an example of superimposing different color layers on gray color as the main color. Not only does it not suppress the colors, but on the contrary, it enhances the color.

Forming effective design methods, we approach the creation of a comfortable urban environment for life and leisure, which is especially crucial in modern big cities.

RESULTS

The analysis of systemic work allows setting the accents, which are found in the historical past, where the foundation was formed by scientific research on color. It is impossible to do without the classical system of physics of color in the studies of scientists of the 18th and 19th centuries and analytical constructivism in the design of the 20th century.

An explicit answer was obtained long ago, it is found in works of architecture, in design objects, and museum exhibits. As a result, the important tasks of planning and color culture in architecture and modern interiors remain coloristic solutions and the placement of color accents. Such accents and linking elements can be color accents and decorative elements. Their participation can change the design intent, both in the direction of reducing the artistic idea and vice versa, enhancing the expressiveness of the creative concept. Many design solutions are based on or use historical features of plastic art, including sculpture, decorative art, and fine art. The principle of using the works of fine art in architecture is indicated in the scientific articles of A.V. Efimov [7] and V.D. Uvarov [5], which analyze the historical features of the cities of the world.
regarding their identity and coloristic environment. The study argues the principle of the need for color harmony in the environment of the city and the interior decoration of buildings and structures. Consequently, to use the expressiveness of an environment, it is possible to adopt a modular system in the creative arsenal with one of the modules being predominant. N.G. Panova and T.O. Shulika write about the supremacy of forming in modern architecture [13] considering the importance of forming as the basis of artistic conception in the design culture [13, p. 300]. However, design priorities often remain dominated by cultural and historical heritage. In particular, in the work of A.S. Bublikova [14], the preference in environmental planning is given to the interaction of traditions in urban planning and the new technologies of our time. In the structure of planning, architecture is considered as a single whole within the system of the city. Analyzing the above options for planning architectural solutions, we can conclude that there is a need to include in the design work the solutions that use color and the harmony of the color scheme subordinated to the color and coloristic unity.

Architectural and design techniques add up to a system, the various studies on the organization of space can be categorized by the main indicators:

1. Functionality,
2. Ergonomics,
3. Primary purpose,
4. The economic component.

The results of the study determine the system of measures, the basis of which is initially a creative intent, which is based on professional tasks. In turn, the creative component will not form into a system of interaction of the architectural and design tasks in planning without the stages of:

1. Creative intent.
2. Imaginative design solution.
4. Dominant visual and semantic elements.
5. Color and coloristic design solutions.
6. Artistic and decorative elements.
7. Means of implementation.

A positive result is unattainable without the interaction of all of the components of the professional process. This process is unified by the main tasks of architectural planning. In turn, they are closely tied to the creative and artistic foundations of design. However, without the organization of an integrated design system with the mandatory inclusion of color and coloristic planning modules, the solution of the architectural design will not get the full interaction of all its components. Design solutions for environments with the predominance of color can be found in various areas of fine art and the proposed methods, their interaction, and priorities assist in resolving the professional tasks. I.B. Melnikova and A.V. Fomicheva analyze modern urban buildings, particularly the interior space in the layout of flats, in terms of correspondence between the authors’ projects and the results of their implementation. The study reveals contradictions and inconsistencies with the character and image of the historical buildings [15, pp. 100, 102].

The preservation of historical buildings and the formation of a consistent relationship between the traditions of urban planning and the organization of the environment are noted in the works of A.R. Klochko and A.K. Klochko [16]. Their study emphasizes the historical research method, the practical method, and their interaction [17]. In focusing on such critical objectives as modern technology in architecture, structural analysis and tectonics of buildings, the formational basis of the construction system, modern Russian researchers dive deeper into the economic problems, abandoning the problems of color and coloristic interactions in architecture and design. This aspect is left out of consideration in the studies of A.V. Popov [18]. Disregarding the decorative and aesthetic aspects of design, the author focuses on the economic side of housing for young people. The urbanistic challenges in design with the increasing pace of modern cities leave no room for aesthetics and artistic extravagance [19]. Nevertheless, another practice is stylistically established and solidified in the priorities of color aesthetics.

**DISCUSSION**

It can be argued that the problem of coloristic and color tasks is extremely rarely discussed in modern research on architecture and design, especially so – the topic of coloristic solutions for building facades. Regarding global architecture, the practical implementation of color and coloristic tasks is quite successfully demonstrated by the implemented architectural solutions in such countries as China, Singapore, Korea, Spain, Mexico, and Brazil.

The experience of these countries is examined in the works of A.V. Efimov and N.G. Panova [7], specifically in the study “Iz opyta proektirovaniia koloristiki istoricheskikh gorodov [From the experience of color design of historic cities]”. The well-known Russian architect A.V. Efimov devoted a number of his works to the issue of the development of light and color in Russian architecture, as well as to the study of foreign experience and practice in architecture and design, stating, in particular, that “The complexion of the city should not be oppressive” [7, p. 260]. It is necessary to note both scientific research and completed projects of Russian architects. T.E. Trofimova gives examples of such practical experiences [11]. Research into the design of airport zones and the design of indoor and outdoor green zones of airports should provide a special microclimate and comfort for passengers and staff.

The system of creating “color comfort” in the architecture of foreign countries presents new modern solutions. Claire Weisz [20] gives examples of a person’s attitude to the environment, a complex systemic reaction to all processes affecting people’s surroundings. A person’s condition is influenced by a wide range of events including

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the architectural image of the city, the lighting of spaces, and the state of light and color in the environment [21]. In this regard, of interest is the study by Clarke Snell and Alex Carpenter [21].

Back in the 20th century, the prominent Swiss artist and researcher Johannes Itten presented the art world with outstanding work on the study of color, its influence, and meaning (2. His books, particularly “The Art of Color”, have now become a guide for the study and perception of color in art and other areas of human life. “Color is life, and the world without color appears dead to us” [22. p. 10].

The study of color opens up new opportunities, especially in art. The manifestations of the influence of color can be found not only in fine art but in all situations and spheres of life. John Maeda’s book “The Laws of Simplicity (Simplicity: Design, Technology, Business, Life)” confirms the idea of finding opportunities and paths for design solutions in which the major role is played by color, as well as for the idea of understanding the language of color and the technology of creating an art piece [23].

CONCLUSION

The present study supports the need for the study and utilization of color and its coloristic capabilities and features in art since the art of color is one of the methods of cognition in any creative profession. To achieve positive results in architecture and design, the study and mastery of coloristic literacy need to be started in the education sphere from training as an architect and designer.

Recently, residential design has been changing for the better. This is driven by room layouts, increased scale and zones, as well as the use of new materials and technologies and the accumulated historical and scientific experience in this area. However, further studies in the field of color and coloristics are necessary. This practice will not only bring diversity to modern architecture but also give a new image of the stylistic features of modern design in most layout solutions.

These factors call for new solutions, one of which may be the use of color, the harmony of the color scheme, subordinate to the color and coloristic unity of the environment.

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