

Media Facade as a New Mean of Artistic Image in the Space of the XXI Century City

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ABSTRACT

The article below describes different aspects of implementation of media-technologies in contemporary architecture. The article focuses more on usage of media facades in high-rise architecture as a very convenient typology of contemporary buildings which can employ LED-screens for creating a new visual image of a single building or a whole city.

The article considers the work with media screens in different scales: from screens that cover part of the building to whole urban scale panorama. The article describes character of changes of artistic image of buildings depending on the various capabilities of various types of media screens.

Keywords: *media facades, high-rise architecture, LED-screens, media-technologies, artistic image of buildings, contemporary city*

I. INTRODUCTION

Modern digital technologies provided to architecture as an art with many auxiliary tools that can potentially qualitatively extend the boundaries and modify the nature of the formation of the architectural image of buildings. The mounted video screens and full-scale media facades can be mentioned in the list of the most obvious innovations. These technologies quickly spread around the world, affected a variety of typologies of structures and they significantly changed our perception of the space of a modern city. The technology of usage of media facades made us to perceive the time factor in a new way in relation to the image of an architectural structure. The idea of permanent incompleteness and variability of the completed building turned out to be unexpectedly attractive to the citizen of the new Millennium, and in response to a new public challenge, the architects started massively experiment in this direction. Thanks to the appearance of media facades, a different perception of architecture and urban space in general has developed. The concept of a "sleepless" city, an attraction city, and new methods for fixing urban dominants that work intensively at night are all the results of using media technologies in architecture.

During its short history, the concept of a media facade as a changing artistic image of a modern building has passed a certain period of origin and development, has acquired stable standards and general

classification, and has spread to various types of structures. Fixing and general analysis of the specifics of media facades usage, depending on the type of structures and geography of distribution of this technology, is the main subject of the proposed article. Since the use of media facades is not only a technical innovation, but claims to be a significant factor in changing of perception of images of architecture by modern people, the study of this process looks to the author of the article an important and relevant reason for scientific reflection in the study of current processes of development of modern architecture.

II. THE CONCEPT OF MEDIA FACADE

Today, media facades have become a ubiquitous technology, actively used in a variety of major cities around the world. The concept of the media facade as a fundamental component of the artistic image of the building gave us the main new rule of perception of architecture – changing the appearance of the building over time. This diversity and variability of the image can work as a utilitarian advertising panel, but it can also reflect the functional content of the structure. In the broader format of the impact of architecture on a person, we can already talk about the impact of media facade on a person as an effective mean of artistic expression, filled with various and multi-layered semantic images.

What is the modern media facade and in what cases is it the most appropriate tool for working with the urban environment?

Since the concept of a media facade is a way of retransmission of visual images on a macro scale, such technologies were immediately demanded for the format of high-rise constrictions. A high-rise tower or skyscraper, as an exceptionally monumental type of

structure, quickly became a convenient typology for demonstrating of new figurative and informational capabilities of media technologies on facades. As a result of the spread of this practice, over the past two decades, several established types of media facades have been developed, differing both in the nature and scale of coverage of the building's surfaces, and in the technological device.



Fig. 1. Vegas Shopping Mall, Moscow, Russia.

In the most utilitarian understanding, a media facade is a giant screen that covers the entire facade of a building or parts of it ("Fig. 1"). The screen is a technological system consisting of many LED elements attached to a common frame. The frame can be made in the form of a rigid grid or a system of tubes, or it can be a mesh structure. In all these cases, this is a structure added on top of the main facade of the building, intended for transmitting mainly advertising video content. More complex solutions are a variety of options for integrating LED elements into the overall structure of the multi-layer building envelope. In this case, lighting control is also included in the overall system for controlling the functions of the facade shell and the building as a whole. These solutions provide particularly broad opportunities for imaginative and artistic solutions to the architectural image of modern high-rise buildings.

III. HISTORY OF THE MEDIA FACADE CONCEPT

The concept of using media technologies for the design of the building's facade has its own background. An important building for the development of the idea

of a whole media facade was the work of the famous Japanese master Toyo Ito. In 1986, he built a transparent "Tower of Winds" in Yokohama (Kanagawa, Japan), which can be considered the first significant prototype of towers with a media facade [1]. The building was a multi-storey glass cylinder, the facade of which usually reflected the surrounding city views during the day, but at night it worked as a colored light lantern. The building can also be considered as a harbinger of the concept of a "smart" facade, since the brightness of lighting and color parameters changed depending on the strength of the wind and the noise level of the environment, that means they were not originally conceived as some visual constants. This idea of visually changing the image of the building turned out to be very promising and was subsequently repeatedly used by many famous architects in a very different typologies of architectural structures.

The European prototype of the idea of a media facade in its purely artistic way rather than utilitarian realization is the internal facade of the building of the Arab World Institute in Paris. Like the Toyo Ito's tower, the Nouvel's building contains dynamic elements that react to the level of illumination of the

building and change the configuration of the surface, simulating different degrees of internal illumination of the interior. Later, this logic of creating a unique image on the facades has already been used by Nouvel for buildings of various sizes and purposes: the changeable "smart" media facade is appropriate for a relatively small Concert hall (2006) in Copenhagen, as well as for the famous high-rise towers Torre Agbar (2004) in Barcelona and the Tower (2012) in Doha [2]. In the Japanese "Tower of Winds" by Toyo Ito, 1300 lamps, 12 neon rings and 30 individual lanterns were built into construction of the facades, and the main was principle of the play of light and color at night time [3]. In the building of the Nouvel's Arab World Institute, in its turn, the main dynamic effect of artistic influence assumed protection from bright sunlight. However, in both cases, a direct connection with the external natural and climatic influence of the environment was assumed to form an individual image of the structure. However, the classical understanding of the term "media facade" in the projects of the 1980s was still quite far away, since the reproduction of a random type of content on the facades of buildings was not yet available.

In the 1990s, the possibilities of computer technology developed rapidly, which quickly led to the

appearance of structures for mounted media facades, which were used primarily for advertising purposes. In 1996, the Nasdaq tower (1996) in New York's Times Square acquired its own full-fledged informative media façade ("Fig. 2"). The adjacent historic building of The Times on the same square has effectively become the city's most expensive Billboard. After the sale of the building to the new owner Lehman Brothers in 1995, the building was empty, but renting advertising screens fixed on top of the historic facades was 400% more profitable for the owners than renting out the premises of the 25-storey high-rise. Thus, Times Square has become a clear example of the effectiveness of media facades as an advertising space. This experience was immediately adapted in other countries, and from separate advertising on existing facades, the architects moved to creating structures that initially focused on using media facades as the main source of forming of artistic appearance of the building. Almost simultaneously with the Nouvel's towers in Barcelona and Doha, the Austrian 22-storey high-rise Uniqa (arch. Hans Neumann, 2004) with a two-layer facade with built-in LEDs, as well as several towers in Johannesburg, which also had huge media facades on the entire height of the building [4].



Fig. 2. Full Screen façade of The Nasdaq tower, Times Square, New York, USA.

A long period of development and adaptation of new visual media technologies to the needs of the figurative language of modern architecture was convincingly recorded in a series of large and socially significant structures, which allows us to consider subsequent works in this genre as a new level of artistic synthesis of current practice and technological innovations.

IV. TECHNOLOGICAL VARIETIES OF MEDIA FACADES

According to its technical implementation, media facades are usually classified by the type of equipment that transmits visual information. There are mesh, rack and cluster screens, which can be used to assemble a hinged facade. In high-rise architecture, cluster screens are most often used to form the building's media facade. The media facade can also be part of a more complex "smart" system, where LED elements are integrated into the structure of the building's envelope [5]. Mesh screens do not interfere with air circulation, allow enough light into the interiors, but have insufficient brightness for full-fledged work in the daytime, which somewhat limits the scope of their effective use. Rack facades are almost transparent, but more than twice as heavy as cluster facades. In its turn, cluster ones are lighter, but more expensive. At the same time, they have the ability to transmit the most accurate image.

In recent years, on skyscrapers and large public complexes, you can find examples of combining functional and artistic understanding of the image of a building in the paradigm of the digital age – when visible changes in the facade occur as a result of monitoring the environment, the internal state and the nature of the functioning of building systems. For example, the color of the outer shell changes depending on the air temperature, or the configuration and angle of inclination of individual enclosing elements of the facade changes depending on the level of insulation. For many years, Nikken Sekkei's developments have been aimed at creating the mobility of individual high-rise building systems that optimize the operating conditions of skyscrapers [6]. At the same time, their visual appearance can significantly change under the influence of these "smart" systems [7]. An integrated media facade as a tool for reflecting such operational optimizations is one of the most obvious solutions.

In the architectural developments of the last two decades, the task of searching for new forms of expression of the building's artistic image is combined with the orientation of modern architecture on the use of "smart" and environmentally friendly technologies. Towers that respond to wind loads, temperature, light, and humidity are the present and near future of world architecture. However, in other types of buildings, the concept of media facade is becoming quite popular,

since it provides a wide choice of new ways of expression of modern architecture at the intersection of art and technology.

V. COMPOSITIONAL TECHNIQUES FOR PLACING MEDIA SCREENS ON FACADES

The media screens of today can use various parts of coverage of the building area. Thus, the bigger the size of screen is, the higher wider is potential variability of architectural outlooks, as visually variable part takes more space of is. Therefore, skyscrapers and large-scale public complexes are an exceptionally favorable typology for development of this concept of artistic expression of an architectural structure in the modern digital age. At the same time, we should not confuse permanent media facades with the phenomenon of architectural 3D-mapping, when images and video images are projected on existing traditional buildings from the outside, transforming the usual appearance of these buildings.

The simplest and most primitive method is to use a giant hinged screen on top of a previously existing facade. Such a screen of arbitrary dimensions, which practically does not correspond to the character and style of the original architectural structure, can be easily installed and dismantled without affecting the main structure of the building. In some cases, these screens may have not only advertising, but also educational function. Screens on the buildings of museums and art galleries (like screens on the modernist building of the New Tretyakov gallery and the Central House of Artists in Moscow) can serve as a convincing example of the justification of such a decision.

A more advanced and architecturally meaningful version of media facades is a screen or several screens that work as part of the facade composition, taking into account the rhythm of individual elements and the scale of the entire structure. Initially, this principle of placing media screens was used in the design of facades of shopping centers, where it was needed to simultaneously display a lot of independent advertising from various manufacturers, but some compositional unity of construction was required. Gradually, a composite solution with an interconnected system of media facades was used in the architecture of public buildings, where the media screen is used as a structural element of the facade, forming the rhythm of the total volume and transitions of individual planes of the facade in a complex configuration of the building.

Finally, the third type of media facade is a media facade as part of the overall artistic concept of the building, covering its entire surface. As part of this approach to shaping the outlook of a building in the space of a modern city in the 2010s, architects began to use compositional techniques that use the contrast of

texture and color of media facades and the adjacent urban environment. A solid horizontal media screen could compositionally form the stylobate of a large

high-rise complex of several towers, and a vertical integrated media facade could highlight a series of high-rise dominants in a citywide panorama.



Fig. 3. Full Screen facade of the Centercity Gallery in Cheonan, South Korea.

Ben van Berkel (UNStudio), in addition to the already mentioned Nouvel and Ito, consistently worked on the development of architectural and figurative techniques that led to such use of media facades. His construction of the Galleria Centercity in the small South Korean city of Cheonan ("Fig. 3") became a kind of artistic Manifesto that justifies the idea of media facades in architecture. At the time of its creation in 2011, it was the largest complex media facade in the world, consisting of 22,000 LEDs. Its fundamental innovation consisted in the fact that the lamps were integrated into the main structure of the enclosing shell, creating a full-fledged two-layer facade with the ability to relay any images with a total area of 12.6 thousand square meters [8]. During the day, the facade of the Korean shopping center looks like the usual glass streamlined volume that reflected the elements of the environment. But in the evening, it turned into a giant light lantern and in combination – into screen for transmitting any visual information programmed for display. At the same time, the facade shell also looks almost transparent from the inside of the building. During the day, it allows the necessary amount of sunlight to pass freely and retains the required amount of heat, minimizing the cost of heating and ventilation. The main artistic effect in the formation of a recognizable image of the building was achieved thanks to the unique media facade of the building.

After the appearance of buildings such as the Centercity Gallery in Cheonan by van Berkel and Makrthal by Maas in Rotterdam, modern architecture has formulated its response to the society's request to adequately reflect the possibilities of media technologies in the practice of modern construction. It has become important to fix the image of the building at a particular moment, because the author's idea of the appearance of the structure is different at different times. Summing up the achievements of the previous three decades, in practice, the transition from utilitarian

advertising use of media facades to a new method of artistic design of large-scale structures, now available to the architectural language of modernity, was completed.

VI. MEDIA FACADE AS AN IMAGE TOOL AND ADVERTISING TOOL

Media facade as a super effective image and advertising tool was tested in the Chanel Ginza building (2004) in Tokyo. Famous American architect Peter Marino, the author of many projects of boutiques and headquarters of fashion houses around the world, proposed to show brand black and white Chanel cage on the facade of the 10-storey building [9]. Already in the process of work, the concept of constant reproduction of current fashion images was born. As a result, on the facades of the Japanese branch of the company, with the help of tens of thousands of LEDs, the fashion shows of the Chanel House of different years were demonstrated around the clock, popularizing the brand in the country. A similar principle was followed by the creators of office headquarters for Coca-Cola and Nike in Johannesburg (South Africa).

In subsequent works, the Dutch architect repeatedly varied the idea of full-scale integration of light and color when creating an artistic image of his buildings of very different typologies. He applied a similar to Korean facade solution in the building of the shopping complex in Hanjie Wanda Square in Wuhan (2013). More complex facades with LED elements were implemented in the Theatre de Stoep in the Netherlands (2008-2014) and in the project proposed for the Boris Eifman dance Theater in St. Petersburg (2009, project). Designing many towers and skyscrapers around the world, van Berkel never tires of experimenting, combining technological innovation with green and eco-concepts. From the capabilities of full-scale media facades, which have already become classic in high-rise construction, van Berkel is increasingly moving to more

complex integrated forms and technologies. For example, The 300-meter Wasl tower (2016) designed by his office in Dubai, almost opposite the Burj Khalifa, has a composite ceramic facade shell with integrated light elements that work as an effective enclosing shell and a smart media facade in accordance with the functional program [10].

To date, the most extensive experience of using media facades is in China. Starting with their use in the entertainment industry, the Chinese demonstrated particular effectiveness of media facades in design of office buildings, then in buildings of shopping centers and in residential buildings. Finally, they started to work with media facades in urban-scale complexes. Thanks to the rapid growth of many cities and extensive new construction works, by the turn of the third decade of the new century, Chinese cities have acquired a variety of expressive towers with media facades, designed both by their own designers and the world's best forces in the field of architecture and urban planning.

The construction of the buildings of the hotel tower and the casino of the Grand Lisboa in Macao ("Fig. 4") was key to the development of internal processes for applying innovations in Chinese current architectural practice. Due to the close attention of the press, this complex became widely known and significantly influenced the subsequent world practice of construction in the field of typology of buildings of an entertainment, sports and recreational nature. Starting in the 2010s, Chinese architects and planners began to perceive the concept of a large public complex or high-rise tower with a media facade as a familiar tool for working with urban scale in an urban environment. Moreover, media towers have become perceived as a necessary attribute for modeling reference points in the visual framework of a modern Chinese city. As a result of the widespread use of this approach, today evening panoramas of Shanghai, Guanzhou, Hainan and many other cities abound with a variety of high-rise towers with media facades, and in some cases, (in Qingdao or Wuhan), make up the main memorable image of the city ("Fig. 5").



Fig. 4. Hotel & Casino Grand Lisboa, Macao, China.



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Fig. 5. Night panorama of Qingdao, China.

VII. MEDIA FACADES IN RUSSIA

In Russia, media facades began to appear in the early 2000s, when the level of development of LED technologies already allowed sufficient variability and variety of image solutions. The first solid media facades were mounted screens of paired high-rise towers at the intersection of Smolenskaya square and the Garden ring. "Golden ring" and "Belgrade" hotels, which required renovation of their rooms, easily adapted their modernist appearance to the requirements of the new digital age. Flickering advertising signs and dynamic festive illumination began to regularly color the ascetic prismatic volumes of the towers, flanking the axial perspective from the foreign Ministry building to the Moscow river.

A clear example of a consistent "coloring" of urban space around the clock was the transformation of the facade appearance of high-rise buildings in Novy Arbat ("Fig. 6"). By the beginning of the XXI century, this classic ensemble of architectural modernism had already passed the peak of its fame as an example of the progressive face of the Soviet architecture. And according to the tastes of the new century, the outlook of the Avenue required more mobility and decorativeness. The attempts to "dilute" the brevity of strict geometry of the identical towers of the avenue happened in the particular period of Moscow architecture known as "Louzhkov period" (Mr. Louzhkov was mayor of Moscow in the 1990s – till beginning of 2000s). However, the "turrets" and postmodern stylizations did not affect the general style

of the avenue. But the subsequent transformation with the help of media facades radically changed the usual outlook of the modernist architecture of the avenue.



Fig. 6. New Arbat Avenue panorama with Media Facades, Moscow, Russia.

Another epochal example of "re-shaping" of modernist architecture in the digital age was the transformation of the "Hydroproject" building. Due to its exceptional position, the new giant media screen on the facade of the high-rise prism immediately became particularly noticeable in the city space. The area of this media screen is more than 38,000 sq. m. and it is able to display images of any complexity. The same practice has spread in Moscow in the context of other iconic monuments of the Soviet modernism: a huge media screen appeared on the front wall of the hotel "Cosmos" near VDNH (Exhibition of Achievements of National Economy), on the side facade, the "long house" in Tulskaya street. Architectural technique that gives a new decorative meaning of the current structures by adding a large media screen with time was used to update the outlook of high-rise residential complexes, giving liveliness to the artistic decision of new shopping centers and public buildings. The most

spectacular and notable buildings with an added media screen include the Mercury tower in The Moscow International Business Center (MIBC), the twinkling spire of the administrative high-rise at the intersection of Seleznevskaya street and the Garden ring, and the Hanoi shopping center on Yaroslavl highway. A particular impression is made by the famous Ostankino TV Tower, two-thirds of its height is wrapped in a media screen. In other Russian cities, the concept of using media screens has developed significantly in relation with a series of international sports events in 2014-2018. Many stadiums received large-scale video facades ("Fisht" in Sochi, "Arena" in Kazan, etc.), which noticeably colored the space of these cities, particularly at nights. For St. Petersburg, a landmark building with a solid media facade was the 42-storey high-rise building "Leader-tower" (2013) on Constitution square, showing a variety of video images on all its facades ("Fig. 7"). The combination of these

examples indicates a fairly wide geographical distribution of these technologies in the current domestic architecture.

All the mentioned structures were widely discussed.

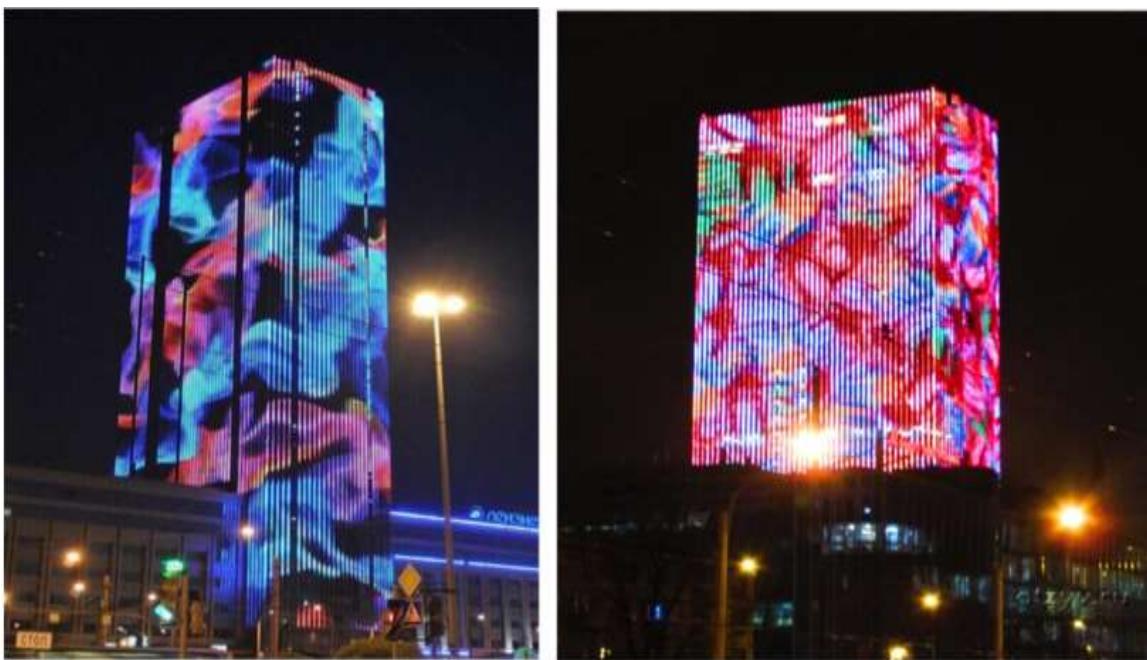


Fig. 7. Leader Tower, Saint-Petersburg, Russia.

VIII. CONCLUSION

The practice of steadily spreading media facades in the life of modern cities is not always clearly perceived by citizens and has both ardent supporters and ardent opponents of this method. Residents often negatively evaluate the environmental aspects of using these technologies, excessive energy costs, and increased heat transfer and harmful emissions. The issue of psychological comfort of such an environment is also ambiguous: excessive brightness and diversity of constantly changing video content of advertising screens negatively affects the inhabitants of houses covered by hinged media screens. Many citizens are concerned about the violation of a certain style unity of historical areas by aggressive coloring of such an environment, as a result of which a person may experience stress and even lose their usual spatial orientation, since an overabundance of light signs and advertisements prevents quiet movement around the city.

Today, the negative impact of an overly bright and annoying visual urban environment is actively studied and regulated in many countries [11]. The brightness of media screens and "light" facades changes at different times of the day, taking into account the needs of residents, individual accent points (buildings with

large-scale screens and media facades) are linked to the rest of the city lighting and navigation, and a unified color palette of districts and streets is being developed. Also, issues with maintainability and durability of the used structures are being gradually resolved. All this leads to a gradual reduction of the negative impact of media screens while maintaining the overall benefit and effectiveness of this approach to modeling the imagery of the spatial environment of a modern city.

The study of various examples of the world's use of mounted and integrated media facades in current world practice suggests that the role of digital technologies in shaping of the artistic appearance of a modern building is steadily growing. Every year, the number of towers and large public complexes actively shaping the image of urban space around the clock is growing, which is impossible without the concept of a media facade in the architecture of individual buildings and entire urban complexes. Every year, the flow of visual information transmitted in the urban macro-scale increases, and the image quality and variety of video content increases. Many architects use technologies of full-scale facade projection of images as a tool of monumental and decorative art of the modern time, integrated into the process of creating a new artistic language of modern architecture. In Russian realities, this brings an update of the image to the existing urban environment and

increases the impact of architectural images on citizens and guests of the capital.

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