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New Materiality-Towards 'Media Environments'

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Abstract

Article presents media solutions providing new materiality of architectural spaces. Media solutions in architecture evolve in new forms. Article presents both the development of new technological solutions as well as new ways of application of media solutions in relation to architectural form. The aim of the article is to show technical aspects of new materiality - intelligent materials, allowing transmission of changeable visual content (like powerglass, GKD mediamesh, IMAGIC WEAVE, TEXLON lexipix, ETTLIN lux, OLED technology) and interaction between a user and space, so as spatial aspects of this new materiality. The goal of the article is to stress that media solutions do not stay just in the vertical position of a media façade, but go deeper in the users' environment creating digital canopies (called in the article "media umbrellas") and complex media environments. "Media umbrellas" due to their horizontal positions make boundaries between private and public space, indoor and outdoor zones, more fluid. Depending on context they can serve various functions. They follow pedestrians, eliminate monotony of long walkways, indicate entrance zones and cover places making them more cosy and more unusual. These structures can constitute fixed elements of architectural surroundings and take part in temporary events, provoking discussions and showing new possibilities. The article presents all types of this kind of solutions to prove that intelligent materials applied in architectural structures can shorten the distance between building and human, and make the space not only more visible and more dynamic, but also more accessible and more friendly.

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Keywords: media facade; media architecture, interactivity; media umbrellas.

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1. Following people – 'media umbrellas' in pedestrian zones

1.1. Commercial power

The architectural expression of media architecture depends mainly on technology, scale, resolution (and other image properties), dimensionality and content [1] [2]. Depending on these characteristics artists and designers obtain variable effects also by "media umbrellas". There are subtle projects working in the second plan and spectacular and absorbing works which strongly attract human attention. To the second groups "Viva Vision" can be classified. This is a huge LED canopy covering the Fremont Street Experience promenade from Main Street to Fourth Street at the height of 30m. It is 420m long and 32m wide vault (see Figure 1a), and is equipped with 12.5 million LEDs and 220 speakers which allow to obtain visual and sound effects. As a result of cooperation with artist Jeremy Railton in 2004, this guaranteed great success of re-evaluation of the historical casinos' district. However, it is important to stress that changeable content follows the aesthetics of surrounding retail area and is far away of ambient lighting.

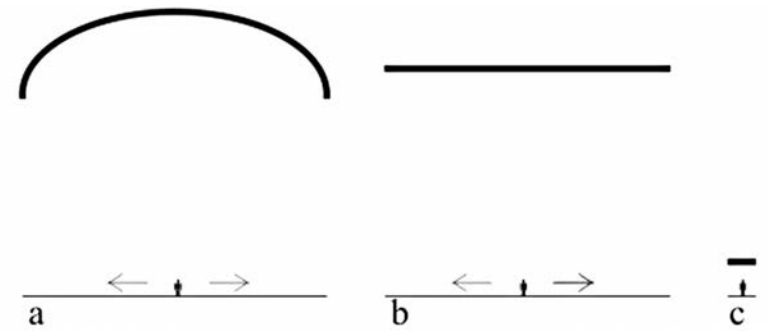

Fig. 1. scale. (by K.Zyczkowska).

Similar solutions we can find also in Asia, where the same artist was involved in a huge "media umbrella" hanging above pedestrian zone at 24m height from 2007. "Sky Screen"– it is the biggest attraction of "The Place" – retail area in Beijing of a surface of 65 000m², invested by Beijing Aozhong Xingye Real Estate Development. This time it is a flat surface 250m long and 30m wide (see Figure 1b) where 10-minute-long clips appear, designed by Crystal Graphics and CCTV. They refer to Chinese tradition and are accompanied with music. Media surface can be also divided into 3 zones transmitting simultaneously films, television, and photos taken by pedestrians [3]. The goal of this solution is to attract people to The Place, but not to stop them, not to take their time dedicated for shopping which is possible because of the scale. However, because of the high resolution, this solution is very absorbing and very intrusive.

As was presented, media solutions can have strong impact on the surrounding, and it is why there is a need for "master plans that perceive the city as a media space" and define zones in which "certain uses of media are welcomed and encouraged, and others these are simply not allowed" [4]. Moreover, it is very important "to find a balance between the technology, content and human acceptation of space". Media solutions in commercial spaces do not have to use aggressive transmissions, but can also use abstract and artistic content for promotion purposes [5].

1.2. Artistic expression

Artistic effect, totally different comparing to previous examples, is obtained in Canopy Maple Leaf Square - a work of United Visual Artists of 2010, situated over the heads of pedestrians in Toronto (Canada). The artists' idea was to make people walking under this structure able to "escape momentarily from the hard environment of the city" [6]. It covers them and brings impressions inspired by nature, using 8000 polygonal modules on the surface 3m wide and 90m long (see Figure 1c, 2a, 3a). Different angles of elements filter the light resembling the effects of the sun in the forest penetrating through the leaves. In the evening this effect is obtained by the artificial light which is a component of the modules, creating smooth, changeable scenes and has a strong artistic power, increasing the quality of space.

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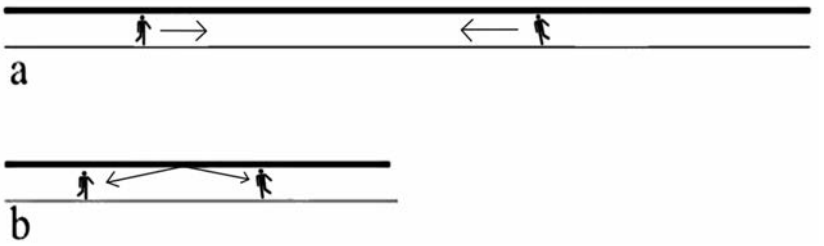


Fig. 2. Relations, (by K.Zyczkowska).

Media umbrellas can follow walking people also inside the buildings. Such a solution was used in Electroland's project of the ceiling over the pedestrian walkway at Indianapolis International Airport in Indiana (US). Installation called Connection and realized in 2008 is built by light dots following passengers with sound and color at the distance of 43m. The media scenario includes linking two passengers approaching each other by the light pattern above their heads [7]. This example shows added characteristic of "media umbrella" – interactivity (see Figure 2b). In this context it helps to eliminate monotony and anonymity of long corridors typical for airports, giving new value to this kind of space.

2. Inviting to come – media umbrellas in entrance zones and to stay

Media solutions catch users' attention, so they are especially suitable in entrance zones to invite people to go inside. Such architecture from an economic point of view is a kind of "product" that lead directly into profits [8]. That is why "media umbrellas" work as a covering surfaces over entrance to the buildings, especially commercial ones. Such a solution is used in Esprit (fig.3a) store in Frankfurt fig. It is a project from 2011, by Corneille Uedingslohmann Architekten (Koln) in cooperation with Ben Hur / LightLife GmbH. Changeable lighting (Dot XL-6 RGB) is used here not only between the store's windows but also at the outdoor ceiling of shed (see Figure 3b) which invite people to go inside [10]. Round lighting fittings appear also in the interior area (along escalators and elevator) which bring the coherent image of the whole place.

a)

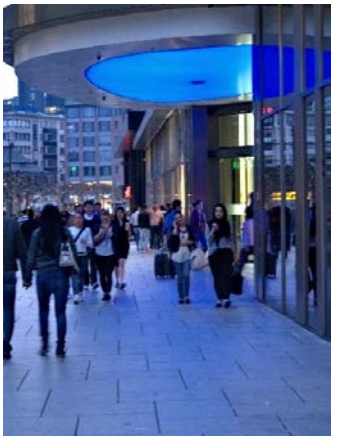
b) 

Fig. 3. (a) Esprit store in Frankfurt; (b) Zeil gallery in Frankfurt. (by K.Zyczkowska).

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The worth of stretching, is the very visible localization of a building, which is situated in the entrance of Zeil - pedestrian commercial promenade in the center of Frankfurt (Fig 3b). “Media umbrella” appears also on the opposite side of this street, in the entrance zone of the Zeil gallery, which was given new media image by 3deluxe in 2010.

Inviting “media umbrella” can be also applied to interior space. Such a solution is proposed by Electroland in Aurora in El Segundo California (US), project from 2013. It provides interactive experience in the entrance zone of DirecTV headquarters. This is a curved structure (see Figure 5c) in the entrance lobby which is visible also from outside through a transparent façade. It consists of 600 curved panels emitting colorful diffused light due to 47 000 LEDs embedded inside [10].

Curved structures can be obtained on a much bigger scale as in Busan Cinema Center in Busan (South Korea), work of CoopHimmelb(l)au (Austria) and Har Hollands (Eindhoven, Holandia) from 2012. This multifunctional building (51 067 m²) situated by Suyeong River consists of three main solids: Cinema Mountain (theater and 3 cinema rooms), BIFF Hill (office space which constitutes a tribune of open cinema for 4000 people (Urban Valley)) and Double Cone (communication core with cafe on the ground floor, and restaurant on the top floor). All of them are covered by two spectacular curvy roofs of about 60x120m. One of them works like a huge 85 m cantilever supported by the form of DoubleCone [11]. The underside of roofs work like huge LED “umbrellas” marking the entrance and space of multifunctional facilities of the open ground floor (Memorial Court & Walk of Fame) where public and private zones interfere with each other. It constitutes a visible invitation to this prestigious object (see fig. 4).

Fig. 4. Fluidity, (by K.Zyczkowska).

Presented examples besides common localization (in entrance zones), illustrate also the issue of integration between the media solution and architectural structure. It can be understood as following the architectural form (simple and complicated) and the scale of this integration. Important is also the characteristic of visibility, used in linking indoor and outdoor spaces, so as the fluidity of image joining private and public zones.

3. Framing the place to stay by media umbrellas

Relations between inside and outside zones influence the way of functioning of space in the surrounding. In turn, void and solid is the basic tool of architectural language in creation of form. Media solutions can follow these divisions increasing this compositional effect – especially after darkness.

Example of architectural void, stressed by media installation, can be notice in a form of Jean Nouvel’s Sofitel Hotel in Vienna (Austria) from 2010 (fig. 5 a, b). Here, the media intervention is just a subtle addition to colorful paintings of Pipilotti Rist (Swiss) but together it creates an iconic architectural image [13]. Artistic composition in vivid colors covers ceilings of the restaurant on the last, 18-th, floor and canopy of the spacious winter garden. (Worth stressing is the form of void dedicated for this winter garden. It follows the form of a lower part of the building which is sliced at the angle similar to the roof of St Stephen’s Cathedral.) Inside, over our heads, small round screens appear which make colorful paintings more dynamic and more involving. These interior “media umbrellas” create unusual atmosphere of the restaurant which is enlarged by a panoramic view through transparent façade. The building, after dusk, works like an “urban lantern” which promotes this 5-star hotel and restaurant space.

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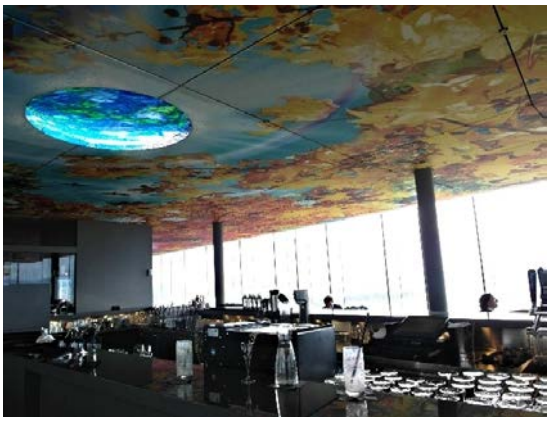
a)  b)

Fig. 5. (a) (b) Sofitel Hotel in Vienna, (by K.Zyczkowska).

4. Towards complex media environments

As indicated above it is becoming clearly visible that media facades do not only take the shape of rectangular flat surfaces attached to the exterior walls of buildings. For the last few years more and more media projects: non-linear, 3-dimensional structures were realized. They present different characteristics and attitudes both in terms of shape, scale, colours, materials solutions, and the level of their interactivity, thus influencing all human senses [14]. "Media umbrellas" described in the text above are already being realized in the form of natural city scale projects and, as it was described, may be classified into regular, characteristic groups. Nevertheless, there are still a number of non-standard, original coverings that are experimental, very often temporary ones, presenting unique features. This phenomenon, so noticeable in the last few years may be well examined on the example of pavilions and artistic interventions realized for world famous light festivals and fairs such as GLOW in Eindhoven, Fête des Lumières light art festival in Lyon, Luminale in Franfurt and others.

4.1. Media coverings-experimental 3D structures

Already in 2005 for CeBIT 2005 trade show an original media canopy was realized by Munich Studios' KMS Team and Schmidhuber + Partner. This unique media ceiling was designed for a German mobile telephone provider and consisted of suspended media tubes ended with Versa Pixels, creating thus a big horizontal display for indoor use. Different length of tubes that differ subtly, formed a 3-dimensional waving surface whose aim was clearly commerce - to attract people, potential clients. This aim was achieved with really new methods at that time. Similar ideas were repeated for both commercial and artistic reasons. Only to mention, for example: Nova project from 2007 realised in Zurich station hall, 1001 Light Rain from GLOW festival in Eindhoven or one of the latest ones - OLED Lumiblade - LivingSculpture, designed by Christopher Bauder from WHITEvoid. Although all these projects are based on the similar idea: of a "media umbrella", they differ a lot in terms of concept and involved technology.

Nova project was a huge-scale object displaying both abstract visualizations and photographic, cinematic picture sequences thanks to 25 000 individually addressable light balls placed one over another in regular rows. Although, as mentioned before, it could display a wide range of graphics, in fact it played the role of a new generation, dynamic art work placed in a public space. Nova took the form of a "media umbrella" - just because there was no other place for such in that station hall. At the same time the public space that is rarely used – place under the ceiling (which in public spaces like a station hall is in most cases imposing) was properly used [15].

This concept of 3 dimensional structural media coverings presenting irregular shapes has been developed in many other media projects. Such an approach presents, for example, the installation 1001 Light Rain shown during GLOW festival in 2013 [16]. It consisted of 1001 sticks - optical conductors hanging like rain drops "frozen" on the picture

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made with long exposure time. This linear sticky canopy was also interactive, relying on sensors and cameras registering the movements of people. From a functional point of view, light patterns changing slowly or faster stimulated people to speed up or relax when walking. In the same time, from the aesthetical point of view, such effects resembled those dynamic effects that can be met in nature: rippling water, heavy rain. This feature that we may call organic, is not typical only for this individual realization. In media projects, especially recent ones, this phenomenon is clearly visible. Media projections in many cases are not representational but illusionary, referring to the effects we meet in nature, repeated organic patterns, create quasi-natural environments, enriching traditional urban tissue [17].

4.2. New media material solutions

To create new media structures such as media umbrellas, ceilings and other 3D coverings designers: freely experiment with innovative pioneering material solutions, and make use of already existing, adapting them for their original projects. Already functioning: stainless-steel meshes combined with LED equipment GKD Mediamesh or IMAGIC WEAVE are being commonly used in many well-known architectural media projects. Simultaneously new material solutions appear on the market that are enriching designers' means of expression. Such materials as TEXLON lexipix or ETTLIN lux allow us to create new effects and more flexible structures: 3 dimensional, irregular, indeterminate by technological restraints. TEXLON lexipix - a transparent foil grid within the high-performance TEXLON® ETFE structure together with high quality LED colour diodes allows for any irregular or amorphous shape. With this material various cut-outs as well as biaxial bending is possible [18]. Another cutting edge proposal for creating 3D experimental structures and "media umbrellas" - ETTLIN lux is a special fabric with point light sources installed behind the fabric that reveals curved, luminous lines heading all for the same direction. The effect is different according to the angles of view which allows for dynamic effects both on curved (ETTLIN lux® MagicFabricas) as well as on flat surfaces [19]. One of the materials that is becoming more and more popular in creating media umbrellas and other 3D structures are optical fibres. Optical fibers were present, and attracted the attention, during the last Luminale 2014 in Frankfurt. Small-scale 3D structures once: in the form of regular sticks, curved over the heads of the space users were forming a kind of protective covering, another time - woven together with textile, were creating wavy canopy. Also OLED technology inspired the designers of media coverings and opened new possibilities to create "media umbrellas" emitting light in a new way. During Luminale 2014 in Frankfurt an original OLED module system designed by Christopher Bauder/WHITEvoid, Philips was presented. This system called - 3-dimensional LivingSculpture - innovative OLED structure allows for individual arrangement. Although its hardware system is made of repetitive illuminating squares, in the form presented by WHITEvoid, it looks like dunes or dynamic waving water waves. Its shape changes: it is more widespread, it takes the form of individual light threads but always rather natural and fluid [20].

4.3. Media environments-shorten the distance

Developing the idea of media umbrellas, canopies, ceilings and 3D coverings designers go further in experimenting and create not only bent, curved, or parametrically formed surfaces. Architects challenge in creating more complex structures that may be called media environments. These structures shelter users not only above their heads, but consist of enveloping walls and floors that in fact cannot be easily distinguished because they create one homogenous entity. The best opportunity to examine how these experimental environments function is to make them in the form of temporary structures in the public spaces that could be explored by many people: during festivals or exhibitions. During Frankfurt Luminale 2014 we could experience several media environments such as: the lighting installation Cornea Ti (fig.6b), Space tunnel at the Frankfurt central station, or Amorphous light caterpillar placed at the city Rossmarkt (fig.6a). Cornea Ti the lighting installation created by students of the University of Applied Sciences in Mainz was a small pavilion or barge where visitors walking inside irregular white-ribbon like environments, accompanied by interactive light, created a personal experience of space. The lighting installation was accompanied by music, and that impression was additionally enriched every night by live concerts. Totally different in terms of form is the light caterpillar on the Rossmarkt, the project reminds us rather of a kind of amorphous quasi-natural system. Its small scale and original form makes it so tempting and inviting to experience it, that its media structure is complementary, does not play the main role. In such environment architectural concept is as important as media

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project, which improves the project re:connect – reflect, installation in Frankfurter Hauptbahnhof made by Tjark Ihmels and the team made also for Luminale 2014. This more geometrical black and white "photographic" channel consists of rotated camera "shutters". Thanks to dynamic projections displaying onto the surface, this channel is inviting you to experience it, and discover new impressions.

a) b)

Fig. 6. (a) reconnect – reflect in Frankfurt, (b) cornea Ti, Frankfurt 2014. (by B. Konarzewska).

5. Summary

Diversified media architectural spaces we observe today due to their horizontal positions do not constitute such a strong boundary in the space as media façades that relate mainly to vertical walls. They make boundaries between private and public space, indoor and outdoor zones, more fluid. They are close to a user, shortening the distance between building and human, make the space more accessible and more vivid. They provide the city with new architectural and urban elements that differ in terms of form and function, presenting more and more sophisticated structures: from simple coverings, ceilings, irregular canopies, to complex media environments.

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