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## *Antitectonics – architecture for information society*

According to anthropology we perceive culture as a reality transformed by man – as a result of civilizational achievements – changed physically, and through symbolic representation – modeling opinions, notions and feelings.

The world is completely filled with culture which is presents directly or indirectly in all potential locations. The sensory perceptions and their psychological effects have numerous interpretations. Where is the border between nature and culture?

The technological development which changes perception – the borders of art (architecture) cease to be definitive. The discussion shifts from clear distinctions (is/ is not) to relative gradation (is to what extent) or even – to parametric simulations (is in what conditions, what determines that).

William Mitchell's essay titled *Antitectonics: The Poetics of Virtuality*<sup>1</sup> [4] can be considered a manifesto of new culture. The author describes the context of creative activities by establishing barriers which architecture crosses while absorbing achievements of the informatization era. He demonstrates the contacts between old and new meanings, scopes and forms of human activity. He undermines the sense of continuing the deliberations on the basis of the tectonic architecture advocated by Kenneth Frampton<sup>2</sup>[1].

The key terms taken from Semper's (1951) description of a building such as earthwork, interior, framework or detail<sup>3</sup> [6] – which defined the traditional tectonic interpretation become useless in the virtual environment. Mitchell claims that the „traditional” theory stubbornly sticks to schemes which are inadequate for the matter

which is described. He notes that *virtual space carries Mies van de Rohe's less is more to a provocatively anorexic extreme.*

The antitectonic debate begins with the presentation of the controversy regarding the scope of space available for creation. The author undermines the conviction of the physical character of architectural structures. The interpretation through understanding of the relationships between the elements which bear and which are borne, gravitational logic of the building and proportions were enough to develop the basis of ancient theories. The postulates of durability and utility are easy to accept when the only way to execute ideas is to create a building of wood or stone. Due to computers the sensations can be perceived in a new, flexible visualization environment whose features require the theory to be remodeled.

The author accuses Frampton of division between a strict physical interpretation and virtuality of explanations. The architectural reality described in the essay IS virtual in a genetic sense. It comprises both forming experiments and workshop procedures as well as fully functional spatial environments.

The technological development of the media alters the sense of artistic creation. The notion of becoming known abruptly becomes relevant covering not only physical substance but information effects of human activities as well. Mitchell stresses that the digital representation is not for architecture a matter of choice by a natural consequence of popular use of CAD. Each project which is prepared with the use of computers is executed in a virtual environment. This fact can be ignored or utilized. Basically – as an inexpensive testing field which, with the application of proper equipment, simulates the conditions of use. More generally – as an individual area of expression.

An architectural work gains in the electronic representation an aspect of 'performance'. Depending on applied means – what is generated is the signals transferred to specific senses or complex simulations, including floating VR visualizations which can evoke sensations similar to natural and automatically generated prototypes. Due to

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<sup>1</sup> W.J. Mitchell, *Antitectonics: The Poetics of Virtuality*, [in:] *The Virtual Dimension: Architecture, Representation, and Crash Culture*, J. Beckmann (ed.), New York 1998, p. 205.

<sup>2</sup> K. Frampton, *Studies in Tectonic Culture*, Cambridge 1995, p. 12.

<sup>3</sup> G. Semper, *The Four Elements of Architecture and Other Writings*, New York 1951, p. 40.



Fig. 1. Kunsthaus Graz, designed by Peter Cook, Colin Fournier. Media façade designed by Realities:United. Photo by author

the functionalities of digital media the record of an architectural idea is more and more like music score. The composition of space, like a composition of music, records the limits of freedom marked by the author. Electronic creation provides for multiplication of representations and generates space for interpretation. As a result of providing access to spatial perception simulation tools even the buildings which have not been existing for years in the real world gain new realizations by extension or parallel.

CAD-CAM technologies transfer the problem of digital creation to the real scale. Mitchell sees the file-to-factory architecture as the culmination of the electronization process. A monitor image, printout, prototype and building – create a hierarchy corresponding, on the one hand, to the complication of equipment, and on the other hand, to the skills of perception of complex environments. The growth of possibilities of creating results from the relationship between two coupled trends: the standards of space description offered by editors are much more efficient than the technologies of production of materials. The fact that it is easy to form, deform, divide and join complex objects on the computer screen stimulates the appetite of authors as well as effort of CAM technology. Furthermore, the procedures available to the numerically controlled machines become the basis for software development. Through mutual interaction – a new myriad of procedural ‘archetypes’ develops. The language of architectural representation absorbs the structures taken from the world of machines.

Apart from technical and functional consequences, the informatization of architecture causes effects regarding the non-usability sphere. The symbolic representation, which is the basic feature of cultural identity, gains through the computer a totally new context. Mitchell describes by listing the features of a façade and interface. The morphology of an architectural object is traditionally a closed artifact. The variation of physical features and

evoked sensations, which is possible as a result of the interaction of such factors as lighting and aging, provides a very narrow predictable range of states. After crossing the threshold of interactivity or at least reactivity we face the solutions bringing a building closer to the functionality which is typical of an information transmitter. The information capacity of a surface/cubature represented digitally depends only on the author’s decision. The saturation of space with sensors creates conditions for the development of changeability and makes a building react in real time to the users’ actions. They extend the real architecture and provides for dynamic transformation of the exterior/symbols. A building can change its ‘façades’ performing arbitrary instructions (of the author) or react in the way coded in the sequence of interactions.

The antitectonic conception is a deliberate exaggeration. The virtual debate between Mitchell and Frampton does not need to be assessed as being right or wrong. What is striking, however, is the pertinence of observations regarding changes which occurred in the domain of space development after computers became universally popular.

The information revolution first of all affected the design tools. The invention of CAD resulted in the dichotomy of representation mentioned in the essay. The traditional architectural graphics (plans, cross sections, elevations) is the domain of professionals, whereas the computer models create the basis of universal perception of a work before development. On the one hand, this is because of photorealism and, on the other hand, application of dynamic techniques of presentation.

The building of Kunsthaus in Graz designed by Peter Cook and Colin Fournier and its media façade designed by Realities:United architects is one of the first examples of deliberate use of digital representation of architectural ideas. A virtual model of its surrounding, which was used to verify the external form of the museum, was developed already at the conception stage, creating the basis of the

application which constituted a virtual perception platform to be further developed in the following year. A user connected with the Internet moves around Graz with the use of a marker on the map. Software reacts dynamically displaying an image of the building from a specific point. The broad scope of functionality enables the users not only to ‘go around’ the museum but also to admire the panoramic view – for instance from the top of Schlossberg. The functionality of the virtual observation window is not limited to the geometric representation. After downloading the video in an appropriate format, the media façade displays animation in the way which is analogous to live exposition in the city. Due to the digital representation – the message of architecture coupled with visual art is perceived by the viewers in a non-material form.

Apart from the creation stage the digital extensions can regard construction and use. The information infrastructure enables the buildings to react to changing conditions. Glasgow Tower designed by Richard Horden which was built in 2001 in Glasgow Science Center realizes this scenario by changing the relations to its surrounding. The form of the structure results from optimization achieved by minimizing the resistance to air. The shape and the location as well as the dimensions of its elements are the result of the compromise between esthetic preferences of the author and the results of computer simulation. The originality of the solution regards the assumption that the exposure to side forces remains constant. A network of sensors measure the wind force and software anticipates the changes of weather conditions. As the digitally controlled engines work continuously this over 130 meters tall structure can rotate and assume the best position towards the wind in real time which assures the best static and dynamic conditions for operation of its elements.

The next step towards digitalization brings architecture to the state in which the exterior of a work resembles the morphology of a live organism. The introduction of sophisticated actuators to the system and the complication of scenarios included in the software enable not only the movement of the equipment elements but also changing the shape and dimensions of buildings.

MuscleBody built by HyperBody under supervision of Kas Oosterhuis is a ‘home’ reacting to the activities of its users’ or the players – as the author prefers to call them<sup>4</sup> [5]. The external skeleton is composed of 26 flexible FESTO actuators stretching the membrane made of Lycra fibers. The sensors fixed inside transmit signals regarding the presence and movements to the computer that controls the pressure in the ‘muscle’ construction. In effect – the form of shelter changes as the users’ activities change. This is accompanied by modulation of transparency of the walls (stretched surface becomes more transparent) and by sound coming from the loudspeakers fixed in the structure.

It is difficult in the light of classical definitions to identify the scenarios of virtual reality with works of architec-

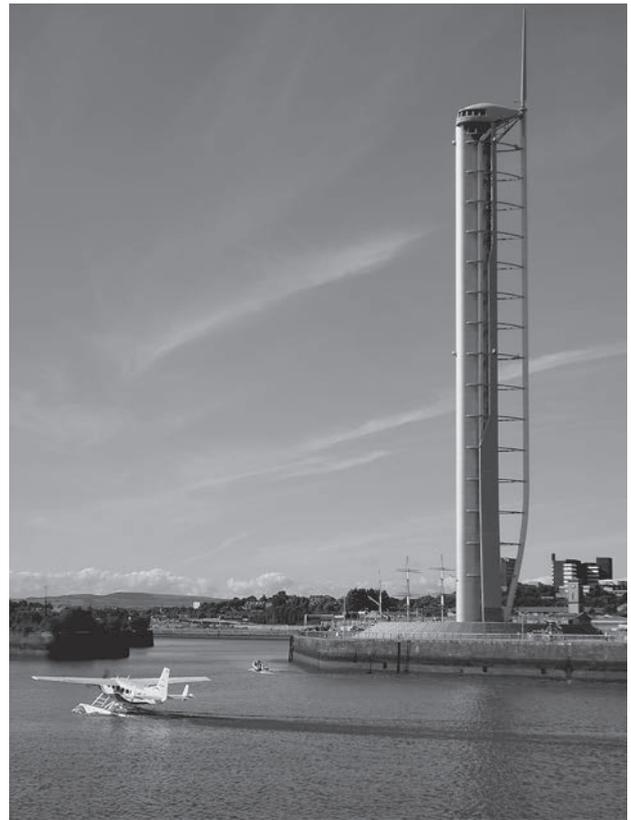


Fig. 2. Glasgow Tower – in Glasgow Science Center, designed by Richard Horden. Photo by J. Woźniak

ture. It is, however, worth noting that apart from the form of materialization they do not differ much from traditional works. Both the techniques of modeling and the reception conditions remain unchanged. What is more – the cyberspace creation often is the domain of architects educated to perform in real world.

The analysis of the design of the New York Stock Exchange building and the virtual Guggenheim Museum designed by Asymptote leads to the realization how far the limits of spatial correspondence can be stretched. Separately we perceive the interiors and exteriors, zoning and the proportions of rooms as in the real world. The social functions of the interiors remain unchanged though thanks to the simulated presence we contact the users located thousands of kilometers away. Interestingly, the authors abandon the ‘gravitational’ requirements of navigation so that the shift between reality and virtual reality is unnoticeable.

The changes in saturation of space with information are significant. The traditional means of coding – form, detail, icon, relief – gain multiple representations. The Stock Exchange building changes its decor depending on the securities market fluctuations. The museum adjusts its interior to selected forms of exhibitions.

Has computerization changed architecture in compliance with antitectonic model? The development of space as traditionally the most durable form of symbolic representation follows the trail marked earlier by other branches of art. The analogies in the cultural context prove useful not only in respect of background description but also expected directions of growth.

<sup>4</sup> K. Oosterhuis, *Swarm Architecture II*, [in:] *Verb Natures*, Barcelona 2006, p. 188.



Fig. 3. ReSwissoffice building, designed by Norman Foster.  
Photo by author

Lev Manovich [3] lists five criteria defining the new media in the sphere of contemporary artistic activity<sup>5</sup>.

1. Numerical representation provides new media objects with a mathematical definition and a possibility of manipulation in algorithmic processes.

2. Modularity enables their analysis by hierarchical disintegration – from basic of pieces information (bits) all the way to complex structures that comply with the principles of logic.

3. Automation, which is the result of application of digital tools, affects the development of new techniques of creation, including a new interpretation of intentionality.

<sup>5</sup> L. Manovich, *Język nowych mediów*, Warszawa 2006, p. 91.

4. Variability distinguishes groups of representations or scenarios included in objects of art that are evoked in the reception process.

5. Transcoding – so far available to a limited extent (e.g. music transcription) regards all new media objects; enables the translation of transfer at the fundamental level and transformation into any form of artistic expression.

Manovich's principles ideally correspond to Mitchell's essay. The use of the term "new media" in space development activities enables the interpretation of architectural works in the context of cultural changes which take place as a result of information revolution. The works which are created in CAD environment uzyskują digital representation. The modular structure of data enables the creation of databases and knowledgebases regarding a building as well as integration of specialist information in a coherent environment (BIM). Automation, variability and transcoding define the contemporary architectural concepts even better than works of visual arts and music which constitute the basis of Manovich's thought. The projects executed by the synthesis of effectiveness are called by Branco Koralevich [2] performative projects<sup>6</sup> – those which best perform assigned assumptions. The automatic processes of simulations regarding geometry, static work and dynamics of flows result in solutions which are the synthesis of author's intentions and parametrization in compliance with specific criteria – such as Swiss RE in London designed by Foster. Due to the mobility of their elements and digital control the buildings are perceived not as single representations but as numerous variations of form, which is especially well illustrated in Kas Oosterhuis's muscle installations. Transcoding symbolism becomes not only easier as the data are digital but first of all more evocative and precise. The BMW pavilion from 2001 designed by Bernhard Franken documents that the process of transfer of the information pattern between such remote areas as dynamics of a vehicle movement and a building form can result in a unique spatial pattern.

Due to the analogy which I see between the Manovich's theory and contemporary architectural designs one can assume the position close to that expressed in Mitchell's antitectonic manifesto. Even if architecture in its core remained the same, because of information technology it is expressed in a completely new language. The language of new media.

<sup>6</sup> B. Koralevich A. Malkavi, *Performative Architecture. Beyond Instrumentality*, New York 2005, p. 8.

## References

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### ***Antytektonika – architektura społeczeństwa informacyjnego***

Esej *Antytektonika: poezja wirtualności* Mitchella (1998) tworzy podwaliny nowej teorii. Podważa sens kontynuacji rozważań na gruncie tektoniki architektonicznej promowanej przez Kennetha Framptona (2007). Kluczowe pojęcia opisu budowli zaczerpnięte z wywodu Sempera (1951), takie jak: fundament, wnętrze, struktura, detal, tracą rację bytu w niegrawitacyjnym środowisku. Jak zauważa Mitchell: „*Less is more* Miesa van de Rohe wyostrza się w wirtualnej rzeczywistości do anorektycznego ekstremum”. Antytektoniczny wywód operuje zestawami antonimów: materialność – wirtualność, realizacja – zaprogramowanie, rzemiosło – CAD/CAM, lokalność – globalność, fasada – interfejs, tektonika – elektronika.

Coraz silniej głoszony jest obecnie pogląd odrywający nowe zjawiska w architekturze od tradycji dwudziestowiecznej. Autor poddaje refleksji

relacje teorii zmiany paradygmatu i wybranych projektów współczesnych budowli. Chciałby dociec, czy między dziewiętnastowieczną tektoniką i antytektoniką przyszłości odnaleźć można wątek ciągłości.

Dla lepszego wyjaśnienia zagadnień wpływu technologii informacyjnej na kształtowanie przestrzeni dokonano zestawienia myśli Mitchella z pracami Lwa Manovicha. Kryteria, które służą opisaniu nowych mediów – głównie w obrębie sztuk plastycznych i muzyki – wydają się adekwatne dla interpretacji architektonicznej. Zmiany w technice i języku wyrażania, niezależnie od rodzaju działalności artystycznej, zawierają pierwiastki wspólne. Koncepcja Manovicha definiująca pięć obszarów wyróżniających sztukę tworzoną przy użyciu komputerów wydaje się dobrym narzędziem do interpretacji architektury antytektonicznej.

**Key words:** antitectonics

**Słowa kluczowe:** antytektonika