Review / contribution to discussion on *2TaLL Project: Application of 3D virtual city models in urban analyses of tall buildings*

On the output of:
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In his essay on the beauty in science, and more specifically in rules discovered by the science that are applicable to the perceived material reality, Subrahmanyan Chandrasekhar states that frequently research leads a man to a conclusion that the truth can be expressed in both simplicity and beauty. The elegance of simple, however not primitive, solutions, and the complexity expressed using a transparent code reflect principles of mathematics, physics, genetics and several other disciplines.

For a number of years, a team, comprising dr inż. arch. Klara Czyńska, dr inż. arch. Paweł Rubinowicz and dr inż. arch. Adam Zwoliński, has been developing a concept of spatial analysis of an urban structure using digital techniques. In their research, members of the team found a simple formula and range of applications for the method, which are expressed in a modelling (simulation) analysis involving algorithms using highly advanced data and the reconstruction of the spatial environment concerned. Although the principle is simple, it does not translate into a simple application. The path from an idea to its efficient application is far from being uncomplicated, like impressions one may get from examining analytical models presented in the 2TaLL project exhibition.

The output of those three researchers evokes respect. Not only did they succeed in formulating a simple idea and showed the entire process of developing the analytical tool, which presents visual impact areas in a city involving shadowing and revealing of specific objects, but more importantly provided for a very useful application of the tool which does not happen too often. While referring to the project concerned, allow me to digress in passing on the absurd ways of distributing grants and qualifying project proposals which in the opinion of assessing parties should not have a practical application, for certain not a commercial one. This, however, completely neglects a specific nature of the discipline of architecture, where the application by architects and urban planners cannot and should not compete with the application by civil engineers in such areas as those covered by the 2TaLL project. In fact, the research should be supported and promoted if findings of the research are going to be commercialized later on. In the discipline concerned, it is the only way of achieving a breakthrough while integrating academic and professional spheres, so much emphasized by those who attempt to improve the effects of research findings.

The 3D simulation of a city, representing its real environment, with its potentially crucial locations that accumulate urban processes, is an example of a scientific achievement that can be practically used in designing. I believe that the issue of spatial analysis should be considered in a broader context.

Czyńska, Rubinowicz and Zwoliński have built an analytical tool as the first very important step that highlights aspects of the urban space which escapes human senses and imagination before it is too late. This is an instrument for anticipating effects of operations in that space, which are far reaching

and durable, operations of irreversible effects once they are implemented. Although the tool has a narrow application, it plays its role wisely and in a comprehensive and complete manner. The result of the research is capable of producing immediate results and has high value and utility by determining a very specific impact on the urban space. It can be a component of an urban space management system, and much more.

As mentioned earlier, it is the first step indeed, since a city is a sort of a biotic structure that depends on life cycles and specific metabolism, and the analogy to an IT being can be solely seen as an elementary simplification of very specific and controlled principles. As expressed by Michael Weinstock and Mehran Gharleghi in their essay on Intelligent Cities and the Taxonomy of Cognitive Scales, the development of IT techniques is sufficient so, from a conceptual point of view, people and the civilization should start considering a reasonable integration of collective social awareness. In this awareness and inter-subjective experience, the urban space is a key habitat with its digital dimension such as the system city management. And it includes vibrating and fluctuating electronic interaction between users and urban facilities, an integration which at least partly has its own identity. The authors rightly indicate that cities were created in result of interaction between the collective intelligence of inhabitants, who managed to combine a specific nature of a place, its hard infrastructure and administrative mechanisms invented by that society to control efficiently the direction for the city evolution. Considering the above, the work by the three researchers virtually does not touch upon the issues raised by Weinstock and Gharleghi. It seems that it rather focuses on the analysis of the form or possibly the structure.

Such approach to the issue concerned as comprehensively covered by the 2TaLL application would be too superficial. Suffice it to say, the direction for the development of research on the architectural space, and even more so the urban space, as expressed in Space Syntax conceived by Bill Hillier or certain architectural applications by Herman Hertzberger, which referred to a limited perspective of the phenomena of space (and I do not mean by any chance phenomenological perspective!). In fact, it boils down to the relationship between a man and his self, awareness of experiencing and feeling, for which the empirical sphere translated into emotional co-development of living conditions is particularly important. The comfort of sensing the space, including public and generally accessible one, and its quality and harmonious, however not necessarily unified, development have direct impact on human wellness. Christian Derix referred to such issues when formulating a postulate of a bottom-up development of space. The process involves relations between a kinetic perception, awareness of space and phenomenological generation and perception of spatial phenomena and physical objects independent from a man and those which he created. It can be described as an anthropocentric process in which not only functional but also formal requirements (not mentioning aesthetic requirements) constitute a premise for developing architectural or urban solutions, and the environment and its user gain direct and indirect ways of influencing the shape of the habitat regardless whether they are architect's clients. Whether it happens consciously through participation or analytically through reflecting on human behaviour determined by the local cultural imprint is not important at this level of general description.

Psychology of space plays a tremendous role both for the urban as well as architectural dimension. The evolution of city structures is more complex than that of individual architectural facilities. An learned architect, in his/her capability of absorbing knowledge from the user of space, needs to remember about the triple nature of space representation, a space which he/she is would like to transform: explicit and implicit expectations of users and objective needs we are unaware of. The contradictory nature of the three modes in which space can be perceived, strictly correlated with each other, requires us to at least partially atomize the issue of urban space quality in order to

develop efficiently the empathic picture of a city using suitable elements. The authors have developed one of such components – an individual calk of a complex picture, a calk which is valuable although limited to the visual sphere of human experience. The precision of the 2TaLL model simulation has become a source contributing to cautious shaping of space, a true parametric approach which does not negate the humanistic aspect. Although the authors use digital techniques, according to the methodology adopted, results of the research enable producing a wide variety of solutions. Moreover, in a mathematical and objective manner the research defines limitations transposed directly from human perception. I admire the work and hope its authors can continue equally fruitful research.

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