CASE STUDY OF GENERATIVE FACADE DESIGN USING BUILDING INFORMATION MODELLING (BIM) TOOLS

Veli Mustafa YÖNDER*

ABSTRACT

Multi-dimensional and intricate building design processes involve numerous dissimilar meta-design methodologies and complex build development procedures. In today's design approach, Building Information Modelling (BIM) tools are included in the process to understand and control the life cycle of the building. It is essential to take advantage of digital information modeling instrument during the new structure design, implementation, and project management stages. The modeling and processing of all structural elements on the BIM platform are effective for controlling all progressions. Forming virtual models to know and manage all the details of the structure is necessary for the solution of problems that may be encountered in implementation. Also, digital mock-ups guide the designer from the early design stages to the final product because virtual models that include all components of the building make it easy to analyze and study at different levels of detail. In the facade design process, it is possible to step out of traditional methods by using novel digital methods. One of the modern methods is BIM tool and innovative design solutions. The design of the facade systems has taken on a diverse physical character with the effect of developing technology. Because of the different types of facades and their implementation, more than one parameter affects the facade design. Apart from aesthetic concerns, it is one of the main parameters to be compatible with building physics and environmental factors. Necessary analyzes and revisions can be made via BIM environment, which enables physical simulations and real-time calculations. In addition, these parameters can be used to find geometric form factors. If the complex geometry challenges are not solved in this digital platform, they can be solved through specific add-ons. Dynamo, an Autodesk Revit extension, is algorithmic based and works with visual coding logic. Digital fabrication techniques, pre-fabrication methods, and on-site production options force the designer to choose at a certain stage. In this study, it has been tried to develop a facade model serving multiple design thinking by using BIM program and generative design methods for Izmir Basmane

* Res. Assist., Izmir Institute of Technology, Department of Architecture, İzmir, Turkey, velimustafayonder@gmail.com

location. In the studied example, the role of BIM in facade design is discussed with its advantages and disadvantages. The flexibility of digital models is examined, except for the parameters that help form the facade form. Moreover, compulsory processes for modeling complex geometries are scrutinized in this study.

Keywords: Facade Engineering, Generative Design, Curtain Wall, BIM (Building Information Modelling)

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