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BENEFITS OF USING BIM TECHNOLOGY IN THE DESIGN OF BUILDINGS AND STRUCTURES

Annotation: With the development of modern computer technologies, instantaneous changes are taking place in the design and construction industry. In this article highlights of benefits of using BIM technology in the design of buildings and structures.

Key words: modern methods, BIM technology, design, building.

In the current conditions, with the rapid development of information technology, it has become necessary for designers to process a huge flow of information and look for new ways to compose it into a single whole. The flow of processed information does not stop even after the building has already been designed and built, since a new object enters the operation stage, it contacts with other objects and interacts with the environment [1].

Modern construction poses new, more complex tasks for designers to construct buildings and structures and imposes completely different requirements that were not even thought about before. We list the main ones:

1) global reconstruction and restoration of previously erected buildings and structures;

2) the need to design facilities as soon as possible; 3) an increase in the external volume of newly designed structures and the degree of their difficulty;

4) the workload of new facilities and the infrastructure surrounding them with engineering communications and equipment [1];

5) the need for environmentally friendly and energy efficient design due to the growing level of environmental pollution;

6) increase in the number of working documentation;

7) the inevitability of calculation in the design of a new structure of its performance indicators;

8) the need to ensure international and international cooperation in design;

9) the need to make the project the least expensive and more cost-effective, more flexible, more stable in a crisis situation in the economy.

All of the above leads to the fact that at present the most in demand will be not so much the paper project of the designed buildings and structures, but their information model, which will be relevant during the entire life cycle of the object. Such a model should not only be an analogue of a conventional cardboard layout created using software, reflecting only the shape of the object, but also a complete information copy of the building with all its “stuffing”, with quantitative geometric and technological characteristics of structures, materials and equipment [2]. In accordance with this, the data must be combined into a single whole and changed taking into account the additions made to them, which, after adjusting the smallest detail, automatically change the whole model.

As a result of the reaction to the current situation, the concept of information modeling of buildings and structures arose.

The principle of designing objects by creating their information model implies, first of all, the preparation and complex processing in the process of modeling complete architectural, design, technological, economic and other data about the object with all relationships and dependencies, when the building and everything related to it are considered as a single object [3]. This concept is called Building Information Modeling or BIM for short.

The term "Building Information Model" was first coined by Georgia Institute of Technology professor Chuck Eastman in 1975 in a journal of the American Institute of Architects called "Building Description System". However, the very concept of BIM has existed since the 1970s [6]. The term building information model is used in a 1992 article by A. Nederveen and Tolman [3]. It was under the abbreviation "BIM" that it was not widely used

until Autodesk released the white paper "Building Information Modeling" [2]. Jerry Lasrin has been instrumental in popularizing and standardizing this term as a generic term for the digital building vision process. It is interesting to note that the following companies also offered their terminology: Graphisoft - "Virtual Building" [1], Bentley Systems - "Integrated Design Model", and Autodesk or Vectorworks - "Building Information Modeling" to simplify the exchange and interoperability of information in digital format [13].

Let us formulate a definition that is most consistent with the current approach to BIM by Autodesk and more accurately describes the very essence of the concept [9].

Building information model (BIM - Building Information Model) is:

- superbly coordinated, coherent and interconnected,
- excellent for calculation and analysis,
- having a geometric binding,
- suitable for computer use
- allowing necessary updates.

Numerical information about a projected or existing facility that can be used to:

- ✓ making specific design decisions,
- ✓ creating high-quality and accurate project documentation,
- ✓ predicting the performance of an object,
- ✓ drawing up estimates for the project and construction plans,
- ✓ ordering and manufacturing the necessary materials and suitable equipment,
- ✓ precise control of the erection of a building or structure,
- ✓ management and operation of the building itself and technical equipment during all.

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