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Building information modeling applications, advantages and its hazards

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DESCRIPTION

One of the most promising recent advances in the architecture, engineering, and construction (AEC) industry is building information modeling (BIM). BIM technology creates a digitally created exact virtual representation of a building. A building information model is a model that can be used for facility planning, design, construction, and operation. It allows architects, engineers, and builders to envisage what will be built in a virtual environment, allowing them to spot any potential design, construction, or operating concerns. BIM is a new paradigm in the AEC industry that fosters the integration of all project stakeholders' functions.

The geometry, geographical linkages, geographic information, quantities and attributes of building elements, cost estimates, material inventories, and project timetable are all described in a building information model. The model can be used to show the whole life cycle of a structure. As a result, material amounts and common attributes can be easily retrieved. Work scopes are easily identified and defined. Within the entire facility or collection of facilities, systems, assemblies, and sequences can be displayed in a relative scale(yates d 2003).

BIM is a virtual technique that integrates all aspects, disciplines, and systems of a facility into an unified virtual model, allowing all members of the design team to work more correctly and efficiently than with traditional methods. Team members are constantly refining and updating their portions of the model in response to project specifications and design changes, ensuring that the model is as precise as possible before the project breaks ground.

Building Information Modeling Applications

Visualization: With a little more work, 3D representations may be easily created in-house.

Fabrication/shop drawings: Creating shop drawings for various building systems are simple. Once the model is complete, the sheet metal ductwork shop drawings, for example, can be easily produced.

Code reviews: These models may be used by fire departments and other officials to examine construction projects.

Cost estimation: BIM software includes cost estimation tools. When the model is changed, the material quantities are automatically extracted and updated.

Advantages of BIM

Building owners can evaluate bids fairly with a quantity survey Cost line by line, using a BIM model that incorporates thorough 3D modeling of all buildings and MEP systems. As a result, the overall bid price will represent actual building material costs rather than estimations. Today's building owners put sustainability first. Instead of 2D drawings, a quantity take-off based on a 3D BIM model produces significantly more precise results. This allows architects and contractors to more precisely describe the quantity of construction materials needed. When this estimate is correct, the pre-bid budget will be closer to the final budget, resulting in a significant reduction in material waste. A precise take-off has a direct impact on the amount of energy, resources, and travel time necessary to procure building materials, resulting in considerable reductions in carbon emissions.

Through informative previews and virtual walk-throughs, a precise BIM model of a building makes it easier to get essential stakeholder feedback. Including the occupant community's opinion during the design phase leads to more successful buildings Communication is both a necessary component of a construction project's success and an on-going problem. All changes, like as timings, schedules, material availability, and the required specialized teams, may be coordinated in real time with BIM digital applications and mobile devices, keeping

all stakeholders informed. When all parties work with the same conveniently available and up-to-date digital BIM model, data loss can be prevented. Furthermore, technologies like BIM and AR can lead to proactive techniques that help control the construction process and reduce potential errors(cheung,2006).

BIM Hazards

Legal (or contractual) and technical risks are the two primary categories of BIM hazards. The first danger is the inability to determine who owns BIM data and the necessity to safeguard it through copyright laws and other legal means. For example, if the owner pays for the design, the owner may believe he or she has the right to own it; but, if team members provide proprietary information for use on the project, that knowledge must be secured as well. As a result, there is no straightforward answer to the subject of data ownership; each project requires a unique response based on the interests of the participants.

Another contractual issue to consider is who will be in charge of entering data into the model and who will be liable for any errors. Taking responsibility for updating and assuring the correctness of building information model data comes with a lot of risk. BIM users' requests for sophisticated indemnities and designers' offers of limited warranties and liability disclaimers are crucial negotiating points that must be settled before BIM technology can be employed (Yousefi, 2010) .

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