# Review of BIM technology in construction sector

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***ABSTRACT:*** *BIM alias Building Information Modeling is a new and emerging software platform which helps in collaboration process in the construction industry. BIM is useful during bidding, preconstruction, construction and post construction. This software addresses project complexity and aids in managing the diverse demands and requirements of designers and contractors. Moreover, the rise in sustainable solutions for construction is aided by BIM's capabilities for positive sustainable change. The arrival of this technology has led to large levels oforganizational change in the architectural design process and promises to continue to play animportant role in both quality of products and efficiency gains in the industry. In this paper, application, benefits and limitations of BIM are discussed.*

***Key Words:*** *BIM (Building Information Modeling),AEC (Architects Engineers Contractors), PIM (Project Information Model), LCA (Life Cycle Assessment )*

## INTRODUCTION

The building sector is recognized as the most important natural resources consumer. Globally, it consumes 32% of resources including 12% water and 40% energy [1]. Moreover the building sector is the main waste producer– generating one third of European waste [2] and it is responsible for 22% of European hazardous waste production [3].

Life Cycle Assessment (LCA) is considered as a complete method to assess the sustainability of a building over its life cycle; and has growing importance in the scientific community [4]. Several studies underline the importance of improving and simplifying LCA application to buildings [5–6]

BIM software can hold graphic information as well as material properties about building elements that the building comprises [7]. It is also identified as a helpful tool that can considerably reduce the time and effort required to manage graphics and data about the building [8,9]

## DEFINITION OF BIM

BIM is a process for combining information and technology to create a digital representation of a project that integrates data from many sources and evolves in parallel with the real project across its timeline, including design, construction, and in-use operational information.

**B**: Because the B in BIM stands for building, think of this as the verb to build, and notjust the noun, as if BIM was for just physical, discrete buildings. In fact, you can applyBIM to infrastructure, civil engineering, and landscape, along with large-scale publicand private projects.

**I**: The I in BIM is about understanding that unless you have information embeddedthroughout the project content.The real value in BIM is the ability to interrogate the model andfind the data you need, when you need it.

**M**: The M stands for modeling. This aspect of BIM probably has the most history, andhundreds of programs for representing the built environment using 3D CAD techniquesand virtual design and construction (VDC) are available.

### *History*

BIM isn't a new concept. The earliest use of the term building modelling was in 1980s, in a paper that predicted model object would connect to relational databases full of different kind of information. Software companies have been developing tools for built environment professionals to design, plan, render, and analyze building and structures for decades.Although most have focused on 3D geometric modelling systems, the largest platforms have been exploring how to make the most of data science and the properties of buildingproducts too. The first use of the term BIM to describe all this goes back as far as the 1990s. The awareness,investment, and supporting documentation have all increased dramatically in the past few years, though.

### BIM in construction

BIM has many benefits during the construction phase of built projects. BIM can be used toschedule and plan out the construction process, including the movement of vehicles andplant machinery. The design decisions made in the model and increased precision ofmeasurement should result in less wastage and higher accuracy during installation, alongwith the ability to explain difficult construction details.Using the model as a communication method improves project teams' ability to collaborateand coordinate the work being done on-site. The model can also be used to calculate andmanage the cost and time constraints of the project. In the long term, BIM will move toward automating the process of code approvals and building regulations too.

***Procedure of BIM in construction***

- Planning
- Design
- Construction
- Operation and Maintenance

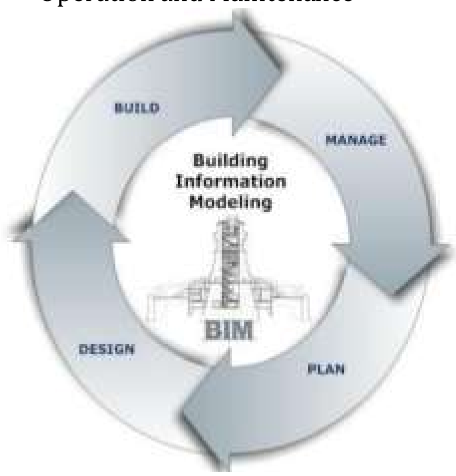


**Fig. 1.** Procedure of BIM

**Applications of Building Information Modeling:**

- Visualization: 3D renderings can be easily generated in house with little additional effort
- Code reviews: Fire departments and other officials may use these models for their review of building projects. [10]
- Cost estimating: BIM software has built-in cost estimating features. Material quantities are automatically extracted and updated when any changes are made in the model. [10]
- Construction sequencing: A building information model can be effectively used to coordinate material ordering, fabrication, and delivery schedules for all buildingcomponents. [10]
- Conflict, interference, and collision detection: Because building information models are created to scale in 3D space, all major systems can be instantly and automatically checked for interferences. For example, this process can verify thatpiping does not intersect with steel beams, ducts, or walls. [10]
- Forensic analysis: A building information model can be easily adapted to graphically illustratepotential failures, leaks, evacuation plans, and so forth. [10]
- Facilities management: Facilitiesmanagement departments can use it for renovations, space planning, and maintenance operations. [10]

**Benefits:**

- Faster and more effective processes: Information is more easily shared and can be value-added and reused.
- Better design: Building proposals can be rigorously analyzed, simulations performed quickly, and performance benchmarked, enabling improved and innovative solutions.
- Controlled whole-life costs and environmental data: Environmental performance is more predictable, and lifecycle costs are better understood.
- Better production quality: Documentation output is flexible and exploits automation.
- Automated assembly: Digital product data can be exploited in downstream processes and used for manufacturing and assembly of structural systems.
- Better customer service: Proposals are better understood through accurate visualization.
- Lifecycle data: Requirements, design, construction, and operational information can be used in facilities management.

**Limitations:**

- BIM is a very advanced technology, so initial cost is high as compared to conventional methods.
- Incompatibility with associates. BIM is not yet entirely used among construction professionals.
- Lack of awareness. Many professionals aren't aware of the benefits of the BIM.
- Lack of BIM specialists. The relative modernity of BIM means that there are limited numbers of expertise working in this field.

## 7. Conclusion:

Appendices should be used only when absolutely necessary. They should come after the References. If there is more than one appendix, number them alphabetically. (A.1)

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