Critical Study and Analysis of High Rise Building Using BIM (5D) In AECO Industry: A Review

Mr. Mallikarjun D. Khot[1], Prof. G.N. Kanade[2]

[1]PG Student, Civil (Construction and Management), Tatyasaheb Kore Institute of Engineering and Technology, Warananagar, Pin–416113, Maharashtra, India

[2]Assistant Professor, Dept. of Civil Engineering Tatyasaheb Kore Institute of Engineering and Technology, Warananagar, Pin–416113, Maharashtra, India

Abstract- *The construction industry has acknowledged that its current scheduling and progress reporting practices are in need of substantial improvements in quality and efficiency. The tradition REVIT, scheduling and cost estimation in Oracle Primavera for high rise buildings (above G+5) in construction*

To combining it with the currently used tools like Microsoft Project or Oracle Primavera help in linking of the activities in a critical path method schedule with the corresponding elements of a three-dimensional 3D model, from Autodesk Revit, thus making the project sequence easier to understand. BIM is a providing catalytic means for rethinking how we design, construct and operate our built environment sector. BIM provides the user with a real time representation of the project which may improve and speed up the construction planning as well as ensure data integrity and accuracy. In this study literature survey is carried out to understand the various techniques used for Critical Study and Analysis of High Rise Building Using BIM (5D) In AECO Industry.

Key Words: Construction Industry, Building Information Modeling, scheduling and monitoring

1. INTRODUCTION

The architecture, engineering, construction and operations (AECO) industry has long sought techniques to decrease project cost, increase productivity and quality, and reduce project delivery time. Building Information Modeling (BIM) offers the potential to achieve these. BIM simulates the construction project in a virtual environment. With BIM technology, an accurate virtual model of a building, known as a building information model, is digitally constructed. When completed, the building information model contains precise geometry and relevant data needed to support the design, procurement, fabrication, and construction activities required to realize the building. After completion, this model can be used for operations and maintenance purposes.

A building information model characterizes the geometry, spatial relationships, geographic information, quantities and properties of building elements, cost estimates, material inventories, and project schedule. The model can be used to demonstrate the entire building life cycle. As a result, quantities and shared properties of materials can be readily extracted. Building construction involves various contractors and subcontractors working in a constrained area. Regarding this constraint, each participant requires definite resources such as laborers, materials and equipment in order to execute their activities.

It is important to note that BIM is not just any single software; it is a process of software interlinks. BIM means not only using three-dimensional intelligent models but also making significant changes in the workflow and project delivery processes. BIM represents a new paradigm within AEC, one that encourages integration of the roles of all stakeholders on a project.

2. LITERATURE REVIEW

Xia Sheng Lee et al. (2013) have worked on this paper about A construction project's success is influenced by the management of quality, time and cost. The major things that concern construction project clients, but are not limited to value for money, include : pleasing to look at, free from defects on completion, delivery on time, fit for the purpose, supported by worthwhile guarantees, reasonable running costs, and satisfactory long life. However, the data generated in a construction project is huge and sometimes inconsistent. This will increase the difficulty of project planning which may lead to misinterpretations and misunderstandings related to project results. The construction project clients, ranging from an owner of a house to a big company having their corporate headquarters, will be at the receiving end of uncertain

outcomes for one of their biggest investments. If this uncertainty is not mitigated, it will affect the construction industry's adaptability in a rapidly changing world.

Dr. Peter Smith (2014) has studied on this paper about Building Information Modelling (BIM) and automated quantities technologies provide both opportunities and challenges for the project cost management profession. As quantification increasingly becomes automated and BIM models develop the role of the project cost manager will need to adapt accordingly to provide more sophisticated cost management services that incorporate 4D time and 5D cost modelling and sharing cost information/data with the project team as part of the BIM integrated project delivery approach.

S. M. Dodia et al. (2015) Construction, structure, architecture, electrical, mechanical, and even management involved in a project can share a single source of information. Predictability of construction costs has become higher and accurate. The use of parametric 3D modeling allows BIM to generate conventional 2D drawings such plan, section, elevation and other documents like schedule and costs automatically. The mistakes in coordination are erased as the changes made in the model are coordinated automatically throughout the project which improves the overall quality of work. The construction industry has been in a need to change and improve the current methods of scheduling and costing. The motivation of research in visualization into these methods has been due to failure of conventional methods.

J. Vinoth Kumar et al. (2009) Building Information Modeling (BIM) is the documentation process consisting of information about different phases of any project like design, construction planning, construction, facility management and operation. It is one holistic documentation process beneficial for operational visualization, and construction application such as estimating, scheduling and design coordination. Main advantage of implementing BIM application is the visual coordination of time and cost of the building systems such as MEP (Mechanical, Electrical, and Plumbing) systems and it also identifies the possible conflicts and clash detection between the building systems. By detecting the conflicts, problems can be resolved before actual construction which in turn saves money and time invested is it very helpful for contractors.

Mr. Swapnesh.P.Raut et al. (2017) The Clash Detection tool is very important and it is useful application of BIM, which is useful for the coordination of systems to make the projects time efficient and economical. As other industries have improved their productivity by using new modify methods and techniques, the construction industry is also applying new technology such as building information modeling (BIM) to assist better the productivity of construction Project Management. A building information model is consisting of the 3D models of the project with links the schedule of Revit model by using time liner and all the required information connected with the projects planning and construction or operation.

Gayatri Dhananjay Jadhav et al. (2017) The Architecture, Engineering and Construction (AEC) industries have long sought techniques to decrease project cost, increase productivity and quality, and reduce project delivery time this can be done by using BIM. Building Information

Modeling (BIM) offers the potential to achieve these objectives. BIM represents the development and use of computer generated n-dimensional (n-D) models to simulate the planning, design, construction and operation of a facility. Construction industry is the second largest industry in India. At the same time due increase in cost of Labor and material and also due to the fierce competition the profitability is decreasing day by day. That is why to increase the profitability there should be strictly control over the project activities of the work. There should be stringent control on the cost and time over run. After this we run our Revit model on navisworks and Schedule done on primavera.

Saini et al. (2013) old scheduling and monitoring technique fail to provide a clear view of the ongoing actual work at the project site. Building Information Modeling (BIM) is Single file is connect all the scheduling and Revit 3D model in one platform. Due to the difficulty observed in using the traditional scheduling and monitoring methods, the construction industry has acknowledged that its current scheduling and progress reporting practices are in need of substantial improvements in quality and efficiency. Research efforts to incorporate visualization into scheduling and monitoring have been motivated by the failure of traditional methods. This traditional method is take a lot time to run planning and scheduling.

N. S. Chougule et al. Construction industry has characteristic of having each product unique and transient. With the growth of technology other industries have changed and improved their process but the construction industry is still labor intensive and following same traditional process of generating drawings by architects or designers and building is erected by contractors.2D CAD (Two Dimensional Computer Aided Drawing) represents only graphical entities like line, circle and arches. It possesses views like plan, section and elevation, in which modification in one view demands for manual modification in all other view. This process is hectic and error prone. Traditional software are not maintain accuracy as compared to today's software. BIM represents each object as a building component like walls, beam and column. Building model gets automatically updated in each view with modification in any one of the view which saves the time and less error prone. BIM contains all the information of each element of building from design to demolition. BIM software is very useful today's world and it minimize the errors and our valuable time.

3. OBSERVATIONS-

1. The study on, "Critical Study and Analysis of High Rise Building Using BIM (5D) In AECO Industry" can be carried out by using BIM software.

2. In this work the Revit software is used for create a 3D model and after that primavera software is used for scheduling.

3. Navisworks manage software is used for simulation of time and cost at one platform.

4. This work can be carried out by different traditional software's like Auto Cad 2D, MSP, etc. These to hectic and take long time to getting results.

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