Design of Plumbing System using Revit Software

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Abstract **- In India there is a rapid growth in the construction sector. Day by day we are forwarding steps into the world where technology is introducing the world as simple as possible. As we know India is a very rapidly developing country in the world. The construction industry in India is improving and providing a lot of jobs to the people. In the late 1960s, there was no growth in technology as compared to today. But now we have so many advanced technologies in our hands. The whole world is taking the initiative to implement technologies in their daily life. So in the construction sector, there is much software which is used in the whole world. "Revit" is one of the software which is widely used and accepted in the world for improving their construction quality. Quality is the main point and inevitable thing. Revit is very much useful for improving the quality of construction and it has so many advantages. But in India, there is no such growth of using software technology as compared to the other countries in the world. But some construction companies in India are coming forward with this technology and by using this they are improving their quality. The design communication is gradually being changed from 2D- based to integrated 3D digital interface.**

1.INTRODUCTION

In India we are facing many challenges. There are so many difficulties and problems raised on-site, but if we use Revit technology in our process of construction, we can eliminate such problems on our computers rather than on-site. It will be helpful for time and cost reduction. In this whole project, we study the objectives of software i.e., "Revit". We will discuss the features of the software that can be useful in our whole construction process.

2. WHAT IS REVIT?

Autodesk Revit is a building information modeling software for architects, landscape architects, structural engineers, mechanical, electrical, and PLUMBING (MEP) ENGINEERS, designers, and contractors. Revit software is based on the theory of BLM-BIM to guide the development of engineering software, to achieve the sharing of different professional information and related. It was overtaken by Autodesk in 2002, Its co-founder was founded in 1997 by Pro/E Software Engineer Technology Revit company. Compared with the traditional CAD platform for 3D modeling and operation, the Revit software based on the concept of BIM has a powerful and sophisticated 3D modeling technology. Revit API(Application Programming Interface ） is one of the powerful applications used worldwide.

Autodesk Revit software has the following characteristics: (1) Powerful visual modeling features: the building, structure and water heating, and other professional design is a very good combination, the formation of a consistent three- dimensional visualization building model, and has a variety of user-friendly data conversion interface, the design of traditional professional design software to import the software, to achieve information sharing and collaborative work. (2) 2D- 3D easy conversion: the process of building design is not only to create a three-dimensional model of the process but also to draw the process of flat vertical profile drawings and three-dimensional expression. The software the 3D model building and its horizontal and vertical section drawings tied, the program design and graphics performance of the combined, so that designers can switch freely in 3D model and 2D drawings. And for the more complex structures, it can obtain the profile of the arbitrary position and analyze the design area. (3) The design has gradually deepened: Revit use 3D visualization technology and data management, which can truly reflect the various physical properties of the building components, in the early stage of the program designers can temporarily ignore these attributes, but with the design depth of the construction project, and

then gradually add or repair the corresponding component properties, until meeting the requirements of construction drawings. (4) The update function of the view: the parameters modification technology provided by the Revit parameters, and the related changes in the model, when the model is modified, it will cause the real- time modification of all view drawings and material list. (5) Architectural primitives can be reused: Revit comes with a wealth of architectural elements in the form of architectural design elements; in addition, Revit also allows users to customize the building components, that is, according to the designer need to design the corresponding components or build their own family, in the architectural design of Chinese sources.

3. DEVELOPMENTS IN THE SOFTWARE

Primary developments-

Revit version 1.0 was released on April 5, 2000. The software showed its progress rapidly, with various versions like 2.0, 3.0, 3.1, 4.0, and 4.1
released in August 2000; October 2000; February 2001; June 2001; November 2001; and January 2002.

The software was initially offered only as a monthly rental, with no chance to purchase. Licensing was controlled by an entire automation process, an innovation at a time when human intervention and manual transmission of authorization codes was required to buy other types of design software and no records were maintained.

Autodesk released several versions of Revit after 2004. In 2005 Revit Structure was introduced, then in 2006 Revit MEP. After the 2006 release Revit Building was renamed Revit Architecture.

Secondary Developments-

In 2011 Dynamo was released in a beta form allowing first glimpses of directly programming the behavior of hosted components through a drag and drop node interface and many more other features.

In 2012 Revit LT became the newest version of Revit on the market. It was a feature-limited or Lite version of Revit which excluded features such as rendering and multi-user environments. In 2013, Autodesk began introducing rental licensing for some of its products, including Revit.

Since Revit 2013 the different disciplines have been rolled into one product, simply called Revit.

Autodesk sells several packages or 'industry collections'; Revit is included in the AEC Collection.

Revit is available in multiple language localizations: English, German, French, Spanish, Portuguese, Italian, Russian, Polish, Czech, Chinese, Japanese, and Korean.

The secondary development of Revit software needs to meet three conditions: Revit products, Revit SDK, and development tools Visual Studio. The Revit products of Autodesk company include Autodesk Revit Architecture used in architectural design, Autodesk Revit Structure, and Autodesk Revit MEP (Mechanical, Electrical, Plumbing).for the structural model. This project mainly uses the third production.

4. METHODOLOGY

The research methodology in this study is based on presenting a model of a residential structure(G+2). A comparison shall be made on the account of various factors such as plumbing. And why we are facing challenges to accept this technology. For the current study, we implement the following procedure Methodology for Revit software.

4.1 Development in REVIT

Revit version 1.0 was released on April 5, 2000. We can discuss how this technology is grown far away. It is based on all software that is of BIM technology. We will see how it developed day by day and year by year.

4.2 Study of Revit

Revit is a BIM-based software. We are facing challenges because lack of skillful people that know how to operate this software. For that, we will discuss some of the main objectives of Revit software. And we will show how it works.

4.3 Comparison with other techniques

There are a lot of technologies are available in the market. We compare those technologies with BIM and see how BIM is useful over all those technologies.

4.4 Analysing of Structure

In Revit, we will prepare a residential building model to show how it is very easy to imagine the structure before actual construction. We will more specifically work on the plumbing system in the residential building (G+2) and after the rendering, the final model will be analyzed.

5. CONCLUSION

It's worth noting some barriers can slow down BIM adoption rates. Lack Of in-house expertise, lack of training, and Revit's associated costs are all barriers to implementing the technology. Nevertheless, clients and contractors increasingly insist on the usage of Revit. Some governments have also taken a strong stance on the matter. In the UK, using BIM has been mandatory since 2011 for companies looking to work on government contracts. Revit has already gone through several developmental phases that increased its capabilities and functionalities. It's a safe bet that more improvements are to come. Stakeholders in the construction sector will need to adapt to remain competitive. Change has been slow for the construction industry. Increased adoption rates for Revit and emerging technologies could help mitigate the sector's many pain points. With Revit and coincided applications, any edit you make to one aspect of your project is automatically added to every single phase of the project. This helps detect and avoid errors that could delay project delivery. This also means that all stakeholders have access to automatically updated information on the project. As such, you avoid delays due to miscommunications or bad documentation. Thanks to building information modeling, an owner can easily check their building's components. Installation dates, maintenance history, and warranty information are all accessible to them. Convenient access to such detailed information helps ensure efficient building management. In the case of smart buildings that have integrated sensors, the combination of AI and BIM could empower facility managers to analyze the collected data for preventive maintenance. It could also inform architecture firms of the quality of their builds and their deterioration over time which, in turn, could allow them to learn from their potential mistakes for their future builds. Some experts even suggest architectural design automation could be a reality in the future thanks to the combination of Revit application and machine learning. From our Revit architectural model, we are trying to show how it is feasible to use this technology in our construction work. We just have to show if in India when we adopt BIM in our construction sector it will give a better result and also reduce the cost of construction because it reduces time and gives more accurate results. Revit is also known as all-in-one software. So just implementing BIM can surely be beneficial to our Indian Construction Sector.

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