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Estimation of Aurangabad Bus Depot Structure with the Help of BIM by using A Revit And Microsoft Excel Softwere for Redevelopment

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ABSTRACT: **The public transport system is in constant development.Leading to redevelopment of bus terminal land .The project work is about redevelopment of Aurangabad bus depot with the help of building information modeling(BIM) providing a linkage between important cities and terminal such as jalna,beed,jalgaon etc.When transist infrastructure is designed to enhance passenger experience,its attractiveness is ensured making it viable alternative to private motorized transport.BIM technique render all project participant to obtain proper information at due time as necessary assist project understanding ,reduce common mistake and support project related decision.CIDCO bus-stand project is presented as a redevelopment land to realize the actual use and benefit of BIM. Cost control plays a major role for being competitive while maintaining high quality levels.**

Key Words: Infrastructure, Building Information Modeling(BIM),REVIT, Microsoft Excel

I. INTRODUCTION

Public transport holds center stage in the urban transport agenda. A well-functioning and sustainable city cannot be achieved without strengthening its public transport system. Infrastructure plays a vital role in the operation of an efficient, convenient and safe transit system.When transit infrastructure is designed to enhance passenger experience, its attractiveness is ensured, making it a viable alternative to private motorized transport. The National Urban Transport Policy (NUTP)[1]recognizes that city dwellers are of utmost importance and that all plans must be centered on their common benefit. With reference to a focus on public transportation, the NUTP document emphasizes the following means:

Building capacity (institutional and manpower) to plan for sustainable urban transport, and establishing knowledge management system that would service the needs of all urban transport professionals, such as planners, re-searchers, teachers, students etc.

In this project, the uses of BIM which include visualization,3D coordination, ,construction planning, cost estimation, scheduling were discussed in detail.CIDCO bus-stand project was presented as a redevelopment land to understand the actual uses and benefits of BIM.for BIM tools were further analyzed by developing a 3D ,4D,5D bus depot model. Furthermore, BIM as the main generator or 4D scheduling were analysed and we try to verify these 3D,4D and 5D by using fuzzy logic.The research concluded that although BIM tools have ability to solve construction related issues, the use of BIM is very beneficial to the construction managers.

In the age of fast development of digitization, it is required to create a new technology to construction of building industry.BIM technique is new technique, brings technological revolution throughout whole building life cycle including investment, construction and maintenance[2] .BIM has potential use at all stages of the project life cycle it can be used by the owner to understand project needs,by the design team to analyse,design,develop the project,by contractor to manage the construction of project [3].

Risk is common in all project work and it cannot be completely removed ,but proper management can affect the risk in project.risk management includes tools and techniques that help project manager to maximize chances of positive event and minimizing the fear of adverse event[4]

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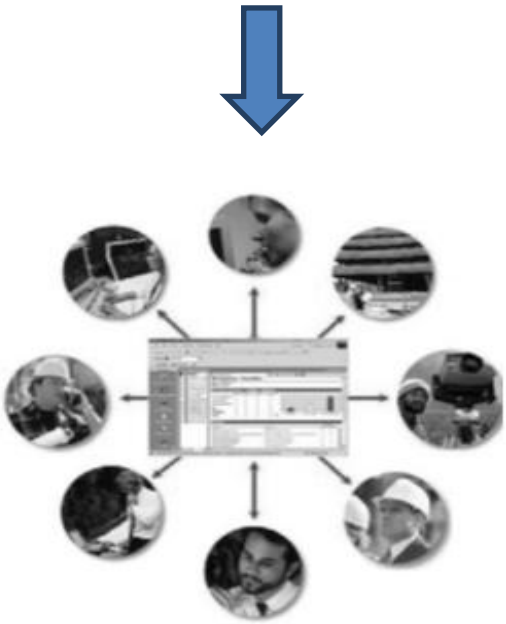
Due to the limited availability of information during the early stages of a project, construction managers typically leverage their knowledge, experience and standard estimators to estimate project costs. As such, intuition plays a significant role in decision making. Researchers have worked to develop cost estimators that maximize the practical value of limited information in order to improve the accuracy and reliability of cost estimation work and thus enhance the suitability of resultant designs and project execution work

Traditional project management



Modern project management

Chart 1:Difference between traditional and modern project management(Martinez-Moyano 2006).

1.1 OBJECTIVES

The objective of this project are as follow:

- To study redevelopment of structure ,building information modeling
- To collect data for case study and analyze it with different parameters.
- To discuss recommend the suggestion and conclusion.

II. LITERATURE REVIEW

[1] Rebekka Volk , Julian Stengel, Frank Schultmann deals with this paper consist of review of over 180 recent publication on the building information model in existing building.he carry out survey and discuss on current trends and research gaps in that area.based on conducted literature review presented the state of art implementation and research of building info-rmation model in existing building with focus on maintenancee and deconstruction life cycle stages.

[2] Ahmad J.and julien L (2015) the paper proposes an integrated time and cost management system in which earned value management process is used during the planning and construction phase of project. firstly he find out difficulties within the construction management industry and looking way for improvement through the use of technology. After finding difficulties he propose a methodology for the development of system which will improve time and cost management of con-struction project.He use softwere for making 5D model consist of Autodesk Naviswork,Microsoft Project,Autodesk Quantity Takeoff.the earned valued management platform is constructed with MS Project.finally the proposed solution will be tested in real case project.

[3]J.Gomez-Romro,F.Bobilloo,M.Ros,M.Molina-Sol-ana,M.D.Ruiz,M.j.Martin-Bautista(2015) present a fuzzy logic based extension of such semantic BIM that provide support for imprecise knowledge representation. They explain how to use a fuzzy ontology reasoner to check the resulting fuzzy semantic BIM for practical purpose and also discuss advantages of using fuzzy ontologies over non fuzzy

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representation in the scope of linked building data research area.

[4] Su-Ling Fan,Chen-Hua Wu and Chien-Chun Hun(2015) this paper deals with study of proposed model for linkage of cost and schedule to BIM element.they study on seven storyed building .researcher develop object-oriented model that links BIM elements to cost item and schedule item.they use Autodesk Revit softwere for preparation of 3D model and at finally system is implemented using MS Visual.

III. RESEARCH METHODOLOGY

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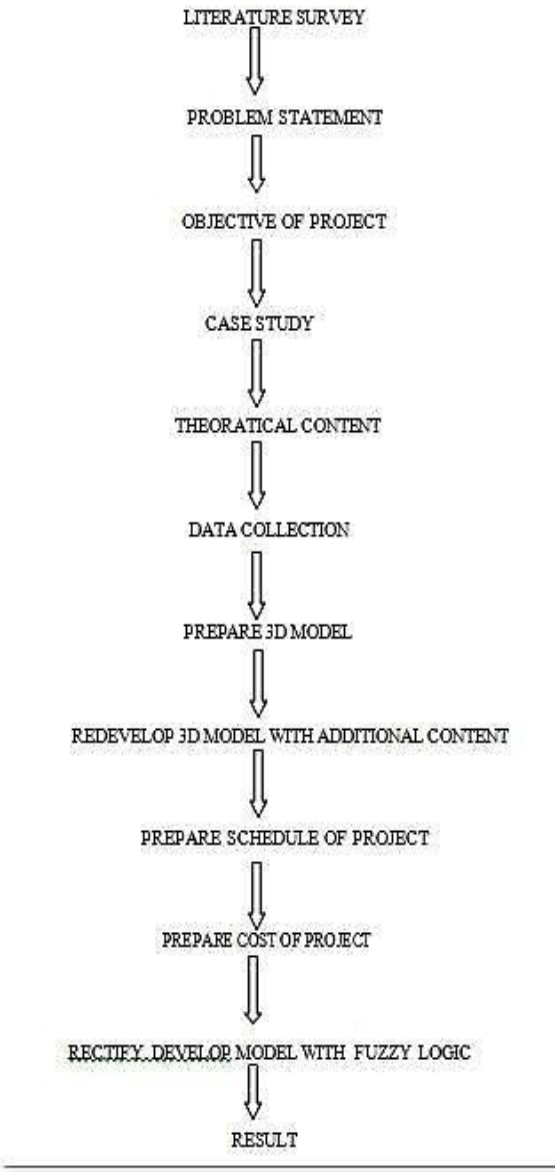

Figure 1: Flow of proposed research methodology

3.1 General

Using REVIT softwere estimating and scheduling of construction are to be done. scheduling is sharing of resources. These Resources in conceptual sense are time & energy, but in practical sense are time ,space, equipment and effort applied to material. This phase presents the method of the study on comparison of construction using building information modeling with conventional construction. A staff quarter apartment building is taken for comparing and it includes the preparation of plan, data collection from certain authority,estimation of quantities, and

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determination of project duration, cost analysis are done.

3.2 Plan Preparation

Plan preparation is done for apartment building to estimate the quantities and scheduling of con-structions project. three storey building is taken to estimate the quantities.

3.3 Estimation Of Quantities

Estimation is used to find out the requirement of the materials for the constructions. The details of the materials which are used in the construction were collected. By getting these details we can estimate the quantities of the materials.estimation is done using MS Excel

3.4 Cost Analysis

This is the main factor which is considered in the project is to find out the comparison of cost analysis of three storey building for the unconventional construction and conventional construction.

IV. DATA COLLECTION AND ANALYSIS

Firstly start to collect relevant data to project.start with collecting layout plan of CIDCO bus depot.after that collecting the total area with existing building present on site.discuss the problem related to infrastructure of bus depot site.finally develop a structure of apartment building with the help of 5D BIM model and check the risk of project with Fuzzy Logic

Figure 2:site map of bus depot

After collection of layout plan of site,prepare 3D model of building with the help of Revit Softwere

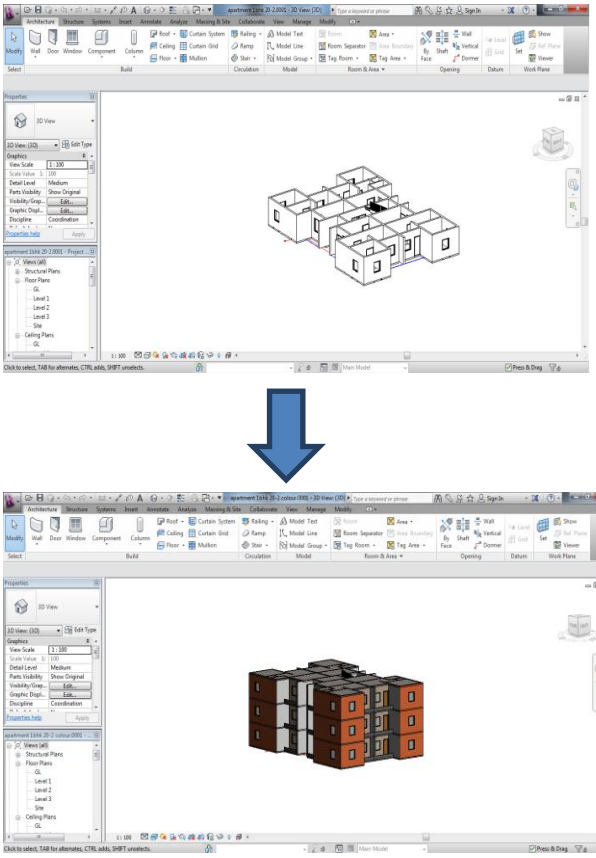

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Figure 3:Proposed Model of Apartment Building

Figure 4:Model of Proposed Building

V. ESTIMATE OF WORK

Table 1: Estimation of Building

Sr No	Particular	Qty	Unit	Rate	Amount
1	Excavation	181.44	Cum	200	36288
2	PCC	9.04	Cum	3800	34352
3	Footing	29.16	Cum	6800	198288
4	Column	34.76	Cum	7500	260700
5	Plinth Beam	11.12	Cum	7400	85288
6	Slab Beam	82.1	Cum	7500	615750
7	Slab	116.68	Cum	7800	910104
8	Brickwork	268.55	Cum	5700	1530735
9	Plaster	2497.43	Sqm	360	899074.8
11	Flooring	450	Sqm	1100	495000
10	Paint	2497.43	Sqm	200	499486
11	Door	134.2	Sqm	2800	375760
12	Window	86.5	Sqm	2800	242200
13	Steel and staircase				600000
	Total Amount				**6783026**
	Contingency 5%				339001.3
	Total				**7122027**

CONCLUSIONS

This project discusses the establishment of structure. As a contribution to urban study, the research seeks a greater understanding about the importance of a bus depot development. The purpose of this project is to describe the characteristics of an optimal bus depot with the help of BIM,better planning BIM not only adds value to the technology but also changes the process of designing and building.BIM technology creates new opportunities for getting information on building,this allow easy and quick access to all characteristics of component,building geometry[8]. 3D model Improved visualization of the project and reduce rework ,4D model give construction site planning related activities i.e.scheduling of project done in 4D modeling and 5D model gives budget tracking and cost analysis in short it give estimate of proposed building.different softwere use in this project are Revit,Microsoft Excel,Microsoft Pro-ject[9]

Remaining Work: It consist of

- Rectifying with fuzzy logic increase the accuracy of project work.

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