

Application of Bim In Bridge Construction

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Abstract- *Most of the world's population today lives in cities. By 2030, the population of the cities around the world is expected to grow from 3.3 billion to 5 billion people. In Israel, about 6 million people live in urban areas. Due to resource constraints, there will be a problem in the future to provide all the services to the residents. To continue to serve and improve the standard of living of the growing population, it is necessary to develop smart cities. The Smart City aims to make optimal and sustainable use of all resources, while maintaining an appropriate balance between social, environmental and economic costs. The main categories that define smart cities include the quality of the environment, energy, water and wastewater, transportation and traffic, information and communication systems, quality of life, government, economics, human resources, housing and land use, homeland security, and emergency preparedness. The degree of preparedness of the city for the collapse of the municipal systems, whether as a result of state security or natural disasters, should also be taken into account. There are many advantages in promoting smart cities in terms of national benefits: creating competitiveness, promoting the business sector, improvement of living standards, proper utilization of resources, and the like. There are examples of smart cities in the world, and a lot can be learned from their experience and achievements. Making a city "smart" is emerging as a strategy to mitigate the problems generated by the urban population growth and rapid urbanization. Yet little academic research has sparingly discussed the phenomenon. These factors form the basis of an integrative framework that can be used to examine how local governments are envisioning smart city initiatives. The framework suggests directions and agendas for smart city research and outlines practical implications for government professionals*

I. INTRODUCTION

The study of Effectiveness of Autodesk BIM (Building Information Modeling) Technology for urban planning of old city Infrastructure to develop BIM city model and to provide ease of services to the citizen. Due to rapid urbanization it becomes necessary to study and plan Infrastructure of the old city, and to serve and improve the standard of living of the growing population, it is required to develop Infrastructure of old cities to smart cities using

appropriate tools and Technologies, BIM Technology is One of the technology which helps for the Effective planning, rehabilitation and Infrastructure management of old city and buildings through various BIM Techniques like Infracore 360, Naviswork, Revit, Etc.

BIM is the process of creating and using digital models for design, construction and/or operations of building projects. Software is simply the mechanism by which the BIM process is accomplished. The BIM process involves participants from the entire project life cycle (architect, engineer, contractor, owner, facilities management, etc.) who all contribute and communicate through the shared models. These models combine intelligent 2D and 3D objects used to define a building design, along with external factors such as geographic location and local conditions, into a virtual building database that provides a single, integrated source for all information associated with that building's design.

The "intelligence" attributed to the objects includes parametrically-defined graphical and non-graphical information, giving the architects, MEP engineers, and contractors the ability to represent geometric and functional relationships between building elements. This information feeds an integrated database, which in turn feeds all design documents and schedules for the building project. When a change is made to the building model, all graphical views (plan, elevation, detail, and other construction drawings), as well as non-graphical views such as the design documents and schedules, automatically reflect the change.

A. Scope of the project

Building Information Modelling process (BIM) is a rapidly growing technology in the field of architecture, town planning and engineering, with the ease of planning and design of the BIM model. Currently, the Building Information Modelling (BIM) methods are used greatly to capture the information of building. Due to rapid urbanization there is a need to find out efficient solutions for the urban mobility, which will enhance the quality of city in terms of traffic problems. And for the planning or the rehabilitation of city it is important to use appropriate tools and technology which will help for the easy and rapid work progress in terms of

management and model of the city. There is need to find out such technologies for the rapid enhancement of city model for traffic and various other urban problem for its management with economy as a constraint of design and model making.

B. Objectives

1. To provide suggestion for efficient urban mobility and public transport using BIM.
2. To study the effectiveness of BIM for affordable housing and in Building Technology.
3. To provide suggestions for safety and security of citizens reducing road accidents due to traffic problem.

C. Overview of project work

Our focus to use BIM technology in the development of city model, due to constraints of time and collection of data from various government and Municipal authorities we have concentrated on the problem of traffic, and its solutions. Traffic congestion is a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queuing. The most common example is the physical use of roads by vehicles. When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream, this results in some congestion of traffic. Traffic congestion occurs when a volume of traffic or modal split generates Demand for space greater than the available road capacity; this point is commonly termed saturation.

In our project we have concentrated on the problems causing the traffic for the selected city areas and in the same sense providing suggestions for its solution using BIM technology. BIM technology is being used for the development of city model for the traffic solutions. We also focused the building constructions as an important element in city; our focus is for the study of effectiveness of BIM in the construction of building technology

II. METHODOLOGY

Study consist of study of Effectiveness of Autodesk BIM (Building Information Modeling) Technology for urban planning of old city Infrastructure to develop BIM city model and to provide ease of services to the citizen.

We have done traffic analysis of the selected area and we have compared the traffic situations on Sundays and other days also at four different times at morning 8:00 AM, 12 PM, 4 PM, 8 PM. Then we have found that there are four locations

where there is big traffic congestion occurring. And we found solutions to resolve the issues related to traffic in those particular areas.

In regards to study the areas which were selected through Google maps the actual site visit was done at Kharadi region, Wagholi and Magarpatta city. Various problems regarding traffic congestion were discussed with local residents, Traffic police officers, and traffic head office of Yerwada region. We discussed with the traffic head officer Mr. Sunil Gurav, about various problems and possible solutions and challenges which may come during the actual working solutions.

- At Kharadi bypass we found there is huge traffic which reduces the time efficiency and making the traffic problems. Major traffic causing vehicles travels form Chandannagar to Wagholi and Magarpatta city. Due to the IT Park and industries in Kharadi and Wagholi region the traffic flow is increasing day by day in those areas. There are lot of problems which cause the traffic congestion, land availability, acquisition of space by UN authorized works, traffic rules, etc.
- The traffic problems can be solved by using appropriate planning, sometimes by flyover bridges at junction, using maximum public transport. And visualizing the models by using the advanced technologies

A. Model making using BIM

Building information modeling solutions create and operate on digital databases for collaboration, manage change throughout those databases so that a change to any part of the database is coordinated in all other parts, and capture and preserve information for reuse by additional industry-specific applications. Through the application of information technology to the problem of describing a building in software, they enable higher quality work, greater speed, and improved cost effectiveness for the design, construction, and operation of buildings and infrastructure.

B. Use of Infraworks 360 BIM software for model development

With Autodesk InfraWorks 360 we can create models from existing data sources and more securely and centrally publish, store, and manage large infrastructure models in a secure environment. With ultra-realistic visual effects, we can better communicate design concepts with photorealistic rendering tools that add dynamic sun and shadows, more

realistic water, and animated clouds. Facilitate the identification of environmentally sensitive areas and important sites such as school and business locations to help uncover potential impacts that could delay the design process. And we can import multiple types of building facades and roofs into your model, making it easy to adjust roofs for height and slope, it also differentiate your services with compelling simulations and visualizations that present design alternatives more accurately in the context of the existing environment.

Infracworks 360 Improve public engagement, gather feedback, and help speed the approvals process by sharing models and specific scenarios with a broader range of stakeholders in a more secure cloud environment. With Autodesk InfraWorks 360, we can quickly design, collaborate, and visually communicate project intent via 3D models, freely navigate through a rich visual environment, and view multiple scenarios in real time during interactive feedback sessions. Storytelling tools videos, descriptive titles, timelines, and points of interest help to improve how you share information.

- The overall study of the area was done in the first phase of the project and then the making of solutions for the identified problems was carried out. After the site visit we observed that major traffic problem is causing due to the vehicles coming from the Chandannagar and moving towards the Mundhwa-magarpatta city road.
- The design of bridge is done for the two ways of traffic that is one bridge from Chandannagar to Wagholi road and another bridge is of from Mundhwa to Wagholi road. The bridge length and height is determined in infracworks 360.

III. RESULTS AND OBSERVATIONS

A. Model applications

1. Construction companies and clients will be save saving money and can achieve economical design
2. Level of skills in the construction industries will gradually improve
3. Sustainable development of building construction can be achieved
4. BIM model can collaborate with various contractors vendors fabricators and client with cloud monitoring of project, which saves time and money
5. BIM can be applied for the urban planning of city through various software's like Infracworks 360, Navis works etc.

B. Results

After imputation of BIM techniques the construction process becomes more effective. It gives 6D modeling of project and it also provide the one platform to architect, engineer, contractor, and management to perform the work foe project completion. It helps to reduce number of employee which also reduce the cost and dispute between employee and employer.

In our project we have study traffic pattern and also carry out traffic analysis of area Wagholi, Magaepatta City and Koregaon Park at different period of time to provide best traffic solution to that areas. We also used infracwork 360 and naviswork for our project. Infracwork 360 use existing data to create the model of project by using infracwork 360 we can design the model and also make the visualized videos of structure.

Naviswork analysis the data and design the model and also simulation is done in this software. It use for scheduling the work to be carried out for quick completion of work. By doing energy analysis we get the data that how much energy is consumed by water heater, HVAC, lighting, misc. equipment, etc. After this analysis we can control energy consumption by adopting PV system.

IV. CONCLUSION

1. With the use of BIM urban planning for urban development and mobility models can be made with less efforts and cloud collaboration. Better Building Projects Building information modeling solutions create and operate on digital databases for collaboration, manage change throughout those databases so that a change to any part of the database is coordinated in all other parts, and capture and preserve information for reuse by additional industry-specific applications.
2. Through the application Building technology to the problem of describing a building in software, they enable higher quality work, greater speed, and improved cost effectiveness for the design, construction, and operation of buildings. What all of us in the building industry are working toward is the building; that is our accomplishment and the value delivered. Every bit of time and effort in the process that goes into something not manifested in the building itself is energy wasted; energy dissipated as heat from friction instead of energy used to make the building better.
3. The time spent coordinating the documents isn't improving the architect's real work nor making the building any better it's just making the drawing set well. Time spent transferring a pile of dirt from one part of the site to another to get it out of the way of the concrete

trucks doesn't make the building any better. Building information modeling solutions allow more of the building team's effort to go into the result rather than the process.

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