International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 5.22 (SJIF-2017), e-ISSN: 2455-2585
Volume 4, Issue 6, June-2018

Comparison of Game Engines for Interactive Visualization of BIM data in Architecture, Engineering and Construction industry (AEC)

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Abstract—***As we know BIM is becoming a standard practice in AEC .More countries are adopting BIM as a standard practice for better utilization of available resources and increase certainity in a ever varying construction projects. An attempt is made to compare two game engines and the interoperability with other BIM software for easy workflow.***

Keywords— GGBS, Setting time, Borax.

I. INTRODUCTION

The use of BIM is becoming a industry standard in construction and architecture as BIM has a variety of advantages like Clash detection, Model portability which the earlier software did not allow. As more and more companies and governments across the world are accepting BIM as a standard for conceptualizing,quantification, design and visualization, the number of software makers are also increasing BIM support for their software. Though BIM draws it inspiration from softwares from mechanical industry, it has come a long way from the concept stage to the acceptance stages. Use of Game Engines for AEC industry, empowers all the stake holders by showing the model in a 3D environment and allows them to draw inferences without the loss of detail which is usually lost in conversation. An attempt to compare two Game engines “Unity” and “Autodesk-3ds Max Interactive” is being made so that there is an effective choice of Game Engine before someone attempts to learn the technology.

II. GAME ENGINES

Game Engines are softwares used to design games for entertainment, educational or any other purpose. Game Engines allow designers for creating games in a 2d or 3d environments. We are not touching upon the 2d game design as much of AEC designs are in 3d and 2d is becoming outdated in a rapid manner. Game engines allow the uses to explore the models in a self paced mode, which was not possible with earlier visualization software like Autodesk-3ds max. Though 3ds max can used for Visualization of models and Creating Walk-Throughs of the project where the user has no control over how long he/she wishes to stay and have a look at the space, further interacting with the existing objects like turning the lights on/off, changing the colour of the paints, changing the time of the day etc to get a feel of how the space or model looks like in different setups were not possible with the existing visualization software. The game engines can facilitate the interaction as well as allow the use of Virtual Reality to further enhance the experience of the user.

III. COMPARISON

For the purpose of better understanding we shall be comparing two game engines

1. Unity
2. Autodesk 3ds Interactive

Attempt is to compare the Game Engines as to enable the future content creators to make an informed decision about which game engine should be chosen for Interactive Architectural visualization.

IV. COMPARISION

Unity: Unity game engine is first and foremost free in most of the cases unless the organization is making more than 100 thousand dollars in revenue annually, for most of the first time content creators it is free as the revenue doesn't cross the threshold revenue. Unity allows the import of FBX models directly from Autodesk Revit, however there are some problems with it as the applied materials are lost in the process, use of third party software is mandated for the smooth workflow without loss of any data when moving models from one software to another. Unity is a powerful software using C# scripts or animations we can program the various assets inside the game engine to interact with the user.

Autodesk 3ds Max Interactive: This game engine the workflow is much smoother and the interoperability between different Autodesk software is much easier as there is nothing lost in translation and a live link between Revit, 3ds max and 3ds max interactive can be maintained i.e any changes in the source Revit file can be directly updated into the game model instead of redoing the whole process of exporting the file from one software to another and redoing the changes manually. The added advantage is that there are many existing templates for various VR headsets which can be started directly.

V. CONCLUSIONS

Unity as a standalone Game Engine is much powerful and with its vibrant an big user base and the store, the game can be floated very easily into a standalone PC,Mobile phone or a VR. It also offers many services like analytics which is missing in 3ds max interactive which are not required in most of the cases of AEC visualization. When coming to AEC visualization and import export between various other softwares 3ds max has an edge over Unity as importing or exporting does not lead to loss of data as all the software belong to Autodesk BIM family. Since much of the existing software for Architectural visualization is already popular in industry by Autodesk, it is suggested that using 3ds interactive is better option as compared to Unity for AEC visualization purpose.

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