An Innovative Dynamic Gamificative BIM environment

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SUMMARY

The need to improve the end user experience to interact with 3D models might contribute towards the delivery of more effective schematic and construction design drawings for refurbishment of existing buildings and improve end user experience. Past research shows the evolution of BIM in construction but so far there is not much research to show the interaction between a 3D model and the end user. Moving to industry 4.0 and Digital Twins is another evidence for improving the interactive experience between 3D models and end users. Therefore, this research shows how to gather data in existing buildings (houses – villa) using Lase Scanner and Photogrammetry, import and process these data to 3D Information Model (LOD 300), set the indoor position and thus to develop a dynamic interactive Gamificative BIM environment to enhance owners and end users experience through the use of HoloLens. Moreover, the indoor positioning system could help end user experience be improved due to the ability to walk through the digital model environment using HoloLens technology thus giving a more holistic understanding and more detailed information about the final digital product. This paper demonstrates the digital engineering strategy that was used. For this purpose, the team collaborated with an industrial partner to test and validate the impact of a dynamic interactive Gamificative BIM environment including its digital strategy. In fact, semi structured interviews with the design team was involved to test the hypothesis and observations to assess end user's reaction within this environment. Results show the efficiency of this dynamic environment in order to deliver both schematic and dynamic design closer to the needs of the client, as well as benefits to improve on time completion. This was achieved because of the improved interaction between the 3D Model and end user through the use of the HoloLens and Indoor Positioning in the premises of the Design Company. The integration of Revit to Unit and thus to the HoloLens Emulator has revealed many challenges. However, the team managed to develop an innovative approach for integrating the 3D Model to HoloLens in order to improve end user experience and thus to provide a comprehensive and continuous feedback by using

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(a)synchronous communication technologies. Benefits show also the added value to the business operation of the design studio due to early adoption and completion of the project. The company increased their capacity to support more projects and therefore to increase the profit.