

# Development of BoG(BIM on 3D GIS) Prototype System

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**Abstract:** The main purpose of this research is to develop a so-called BoG(BIM on GIS) system that could integrate and manage in-door and out-door information in a seamless way. Numerous researches have been conducted to integrate BIM(Building Information Model) and 3D GIS for integration and management of in-door and out-door information. However it is found that it is difficult to integrate BIM and 3D GIS models at the same time, because of differences in data model and domains. Major differences between 2 data models are as follows: First, while BIM is a parametric model, general 3D GIS model (e.g. CityGML) is surface model. Second, BIM usually just focuses on 1 or small number of buildings, however 3D GIS should handle and manage thousands of building at the same time. Third, BIM contains relative coordinates, 3D GIS, on the other hand, contains absolute coordinates. Lastly, the file size of BIM is usually bigger than that of 3D GIS's. To overcome these differences and hurdles, there were 3 major attempts from researchers. First, we devised a new data format called G3D. G3D format is a kind of surface based data model that could hold geometry & attribute information from IFC (Industry Foundation Class) and other well-known 3D format (e.g. KML, 3DS). Second, we developed G3D format converter and G3D viewer. After converting IFC to G3D, the loading and rendering time were increased drastically. Using G3D viewer, users could enjoy fast and various visualization effects including transparency, pulling-out respective story floor and even navigation. Also users can identify and manage the attribute information of each part. 2D floor plan can be extracted semantically using BIM classes too. Third, we developed new Web3D GIS platform that could adopt G3D format and other well-known 3D format. By combining traditional out-door based 3D GIS and in-door BIM information, this new Web3D GIS platform gives new impression and possibilities for managing urban information. With this system, user can handle and manage the spatial information from the earth scale to office desk scale. As a conclusion, BoG system could open new possibilities for urban scale facility and energy management.

**Keyword:** BIM, 3D GIS, IFC, Platform, Interoperability