

3D CADASTRAL INFORMATION SYSTEM USING CGA CODE AND CITY ENGINE FOR MULTI STORIES BUILDING WITH DIFFERENT VERTICAL OWNERSHIP ID's , A CASE OF ADAMA, ETHIOPIA.

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Abstract: The current scenario of house ownership registration in Adama Municipality, Ethiopia is on hard copy and 2D CAD files. These records are suitable only for managing horizontal parcels. These conventional methods of registration create confusion when applied to the multilayered vertical apartments. Hence, the registration and solving complex cases of vertical flats reflecting their Rights, Restrictions and Responsibilities (RRR) in 3D has become a vital need. Initially, the dimensions of buildings were obtained from hard copy data and CAD files followed by graphically integrating the obtained dimension into extracted building footprints from aerial photographs in GIS. Later on, the internal partitions shared, and private utilities were digitized into the footprints according to their dimension from architectural plan. Depending on the number of floors the footprints were duplicated and stacked. Accordingly, the architectural plan was dimensionally incorporated for each floor. On the other hand, socio-economic and legal documents were collected and integrated into the attributes of vertical parcels. To visualize the complex reality in 3D, many distinct Computer Generated Architecture (CGA) code were developed and employed. Finally, the virtual reality was also incorporated using CGA code into the condominiums through real textures as a source from close range photogrammetry following “3*3 rules”. The resulted virtual 3D model was validated topologically to ensure the real-world appearance and vertical ownership details of the building. Finally, from the city engine, a web scene was created for online access by specified users.

Keywords: 3D Model ,Mass Modelling, CGA, 2D/3D Cadastre, Close Range Photogrammetry