
Building Information Modeling for a Smart and Sustainable Urban Space

Edited by

**Rafika Hajji
Hassane Jarar Oulidi**

Color Section

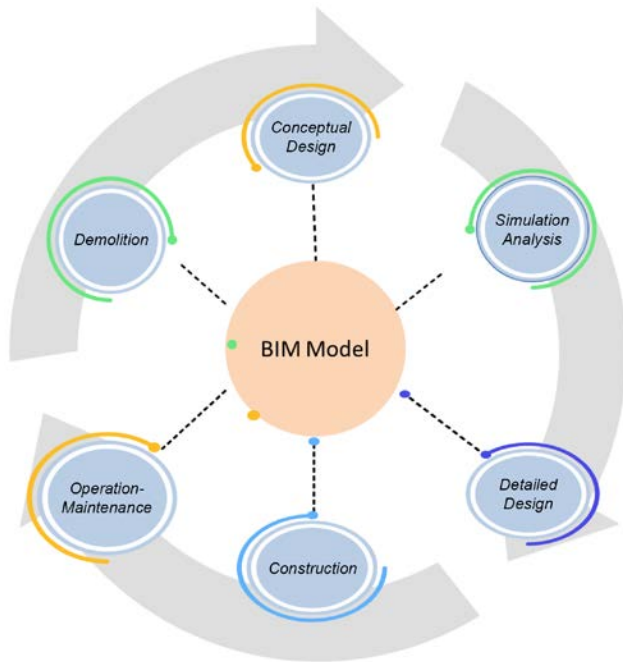


Figure 1.3. *BIM is in the lifecycle of a building*



Figure 1.4. *Visualization of a BIM model using augmented reality*

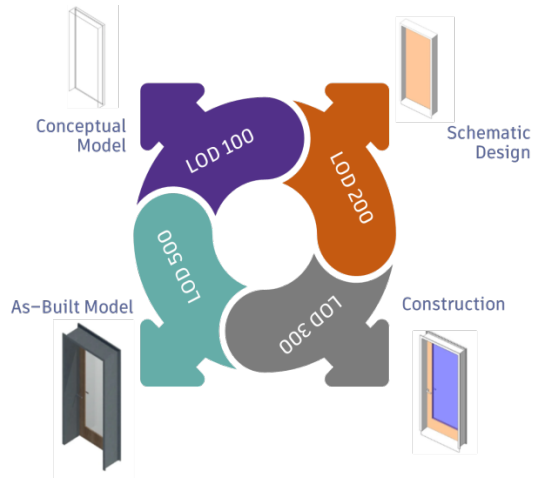


Figure 1.7. Representation of LoDs according to the stage of the BIM project

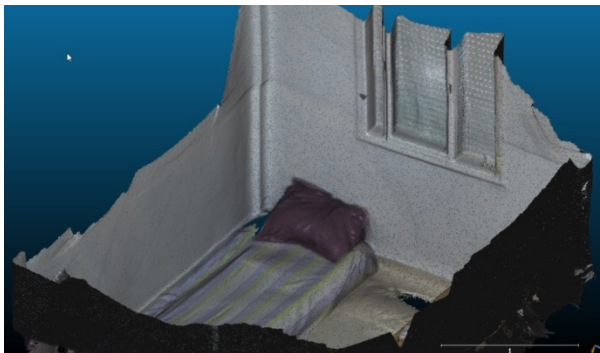


Figure 2.2. Example of a 3D scene captured in an indoor environment (Cai et al. 2017)



Figure 2.3. Characteristic line survey by total station

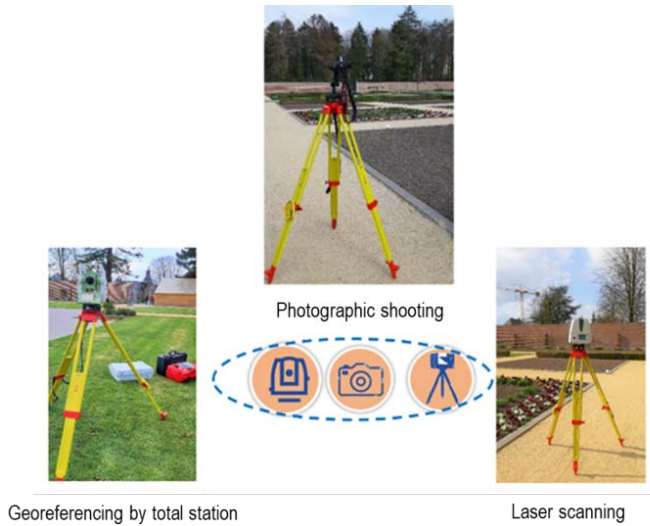


Figure 2.4. Fusion of laser/photogrammetric data and tacheometric surveys for 3D site acquisition

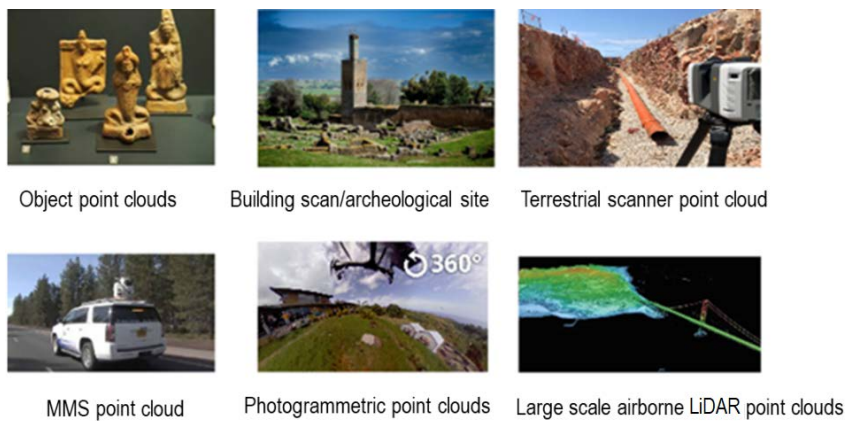


Figure 2.6. Different point cloud acquisition techniques at different scales

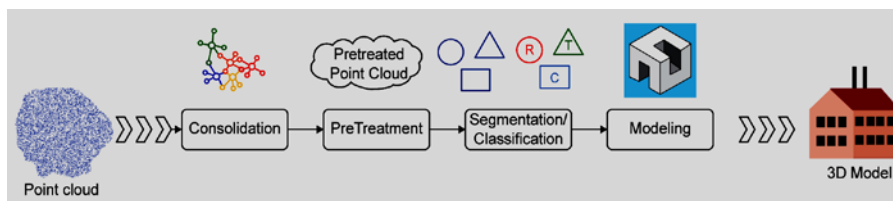


Figure 3.1. Processing chain from a point cloud to a 3D model

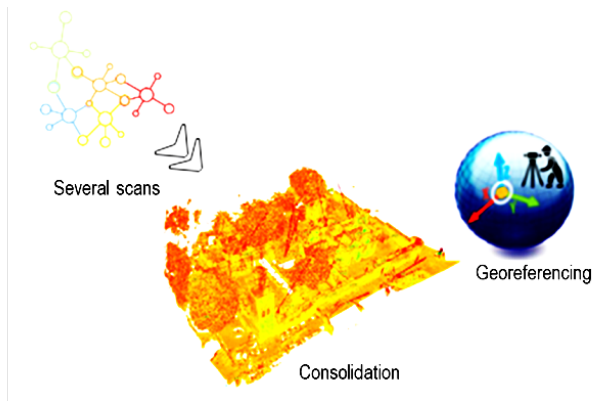


Figure 3.2. Consolidation and georeferencing of a point cloud

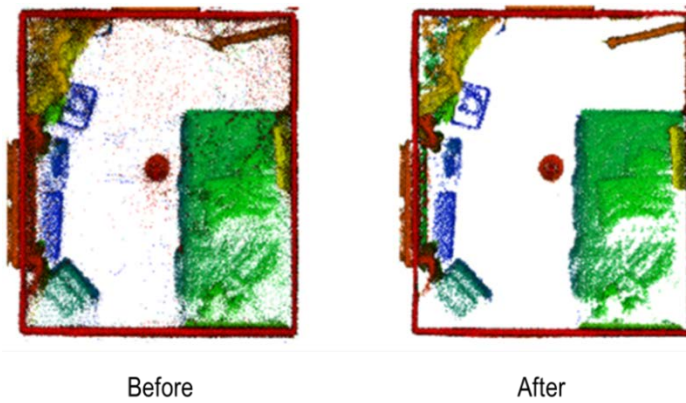


Figure 3.3. Pre-processing of point clouds by cleaning

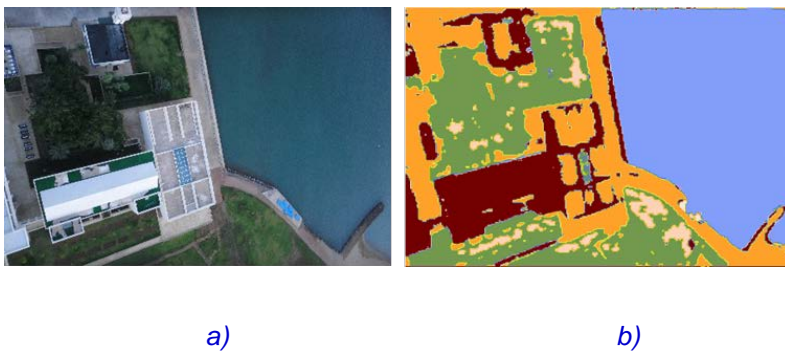


Figure 3.4. The principle of segmentation



Figure 3.9. *Classification of a point cloud in an indoor environment*

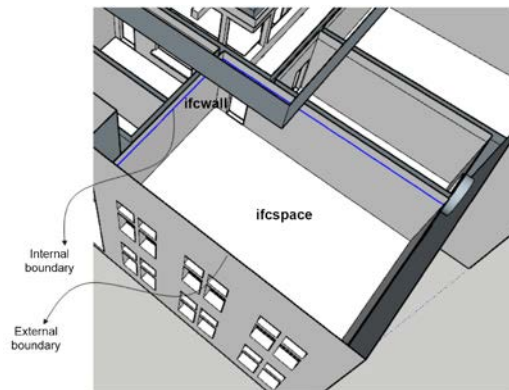


Figure 3.10. *The notion of space in IFC*

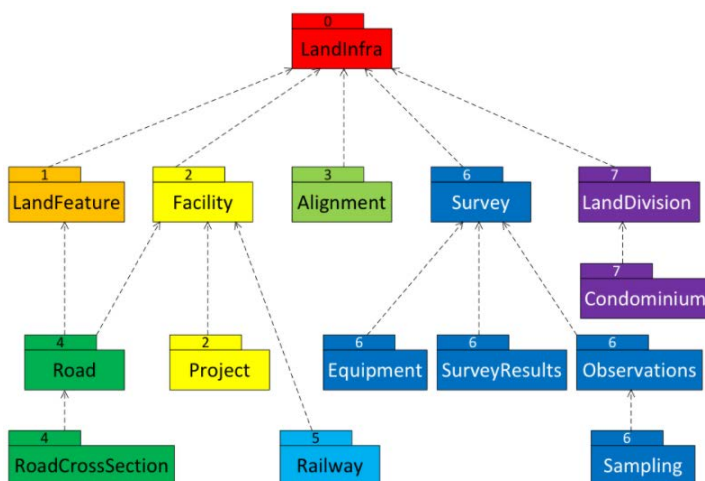


Figure 4.2. *LandInfra classes grouped into InfraGML parts (OGC 2016)*

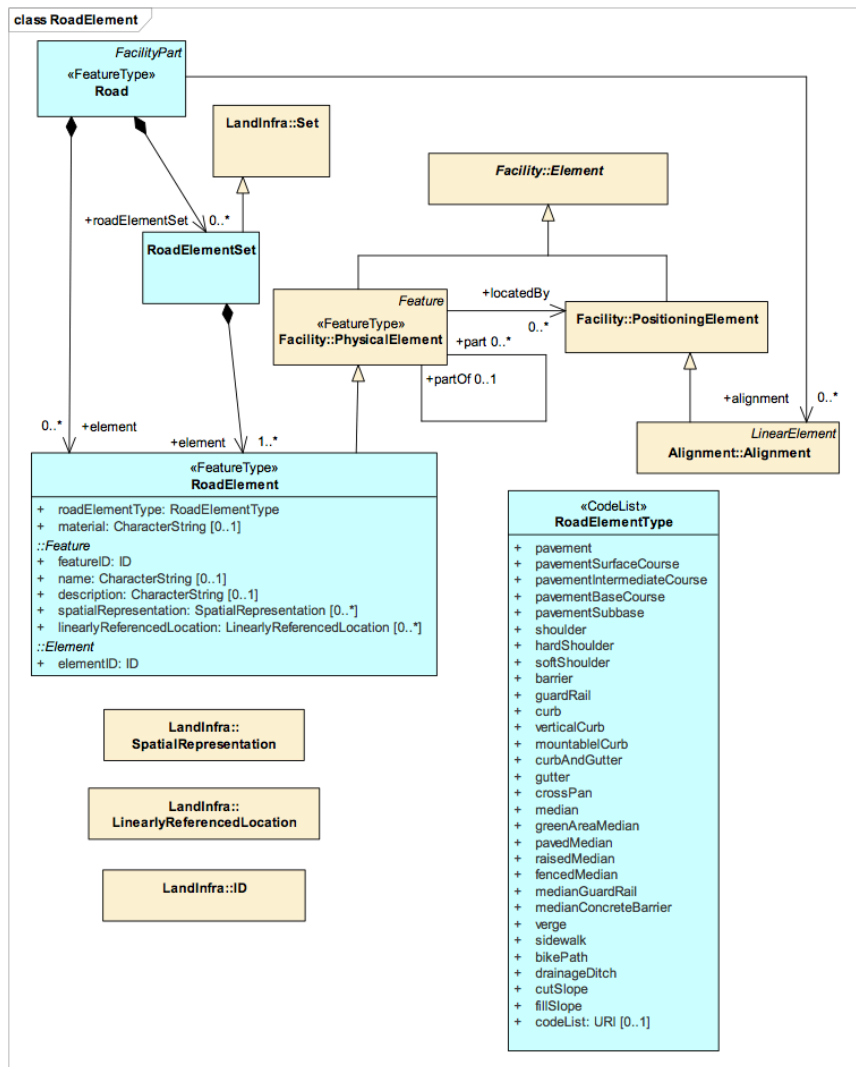


Figure 4.3. RoadElement diagram (OGC 2016)

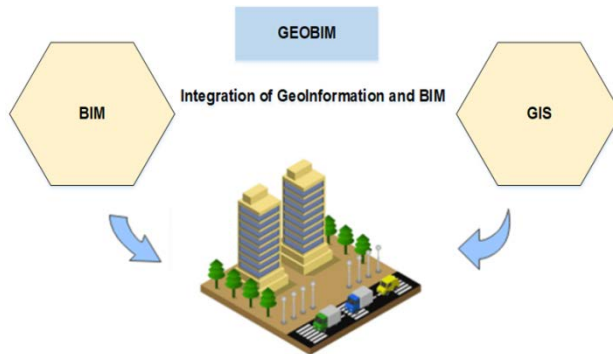


Figure 5.1. *The GeoBIM concept*

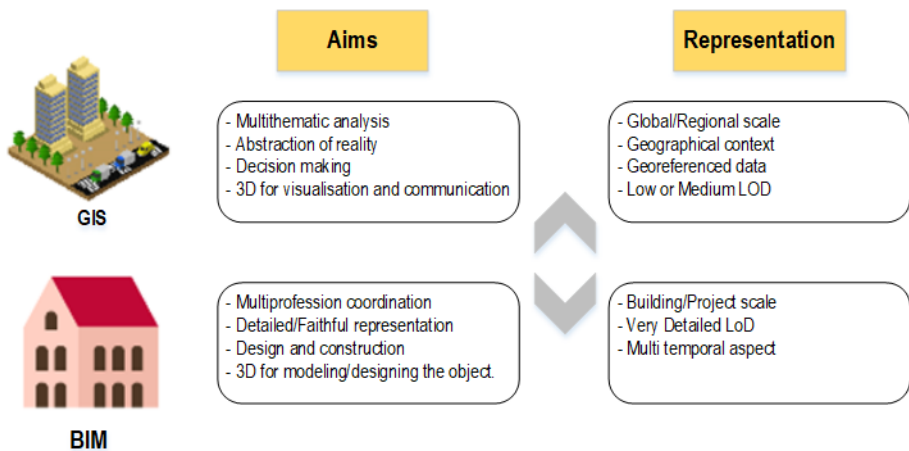


Figure 5.2. *Differences between BIM and GIS*

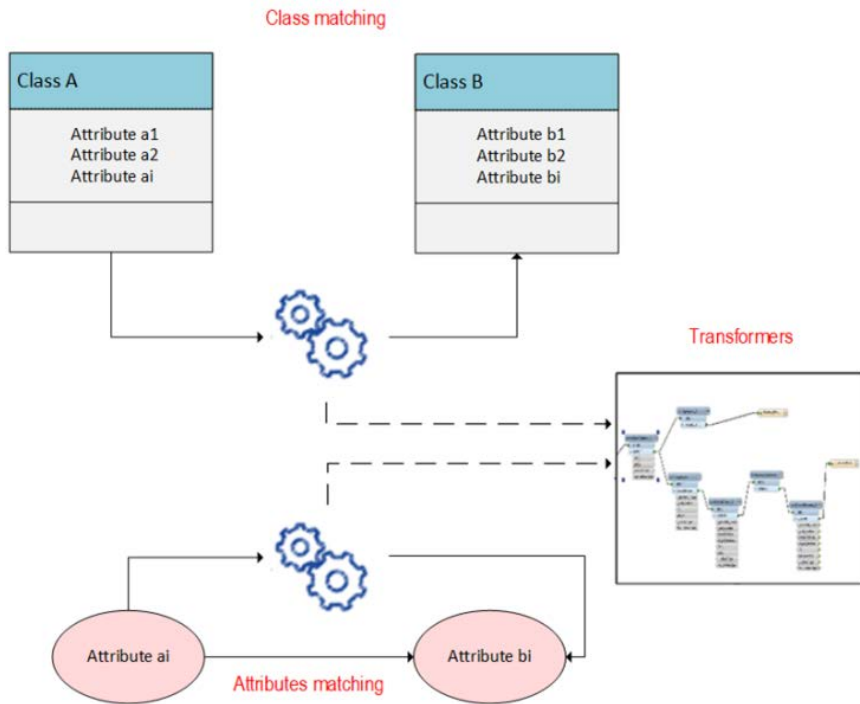


Figure 5.5. Schema matching – “Read-Write” process

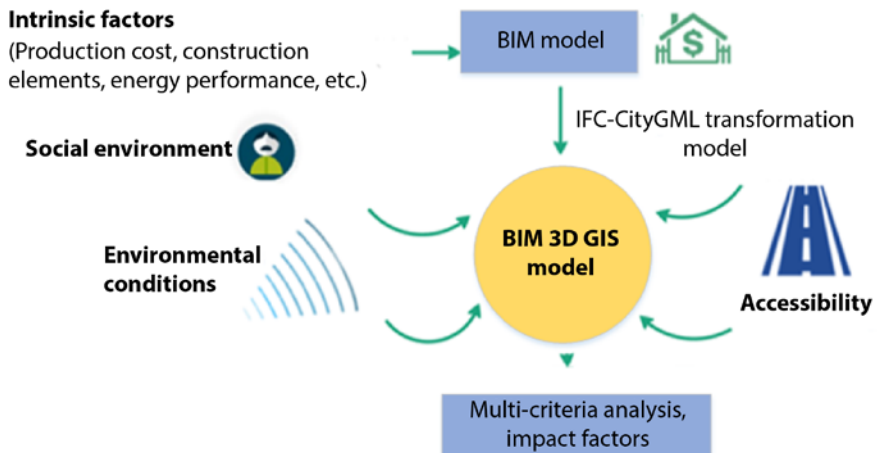


Figure 6.1. BIM and 3D GIS integration for real estate valuation

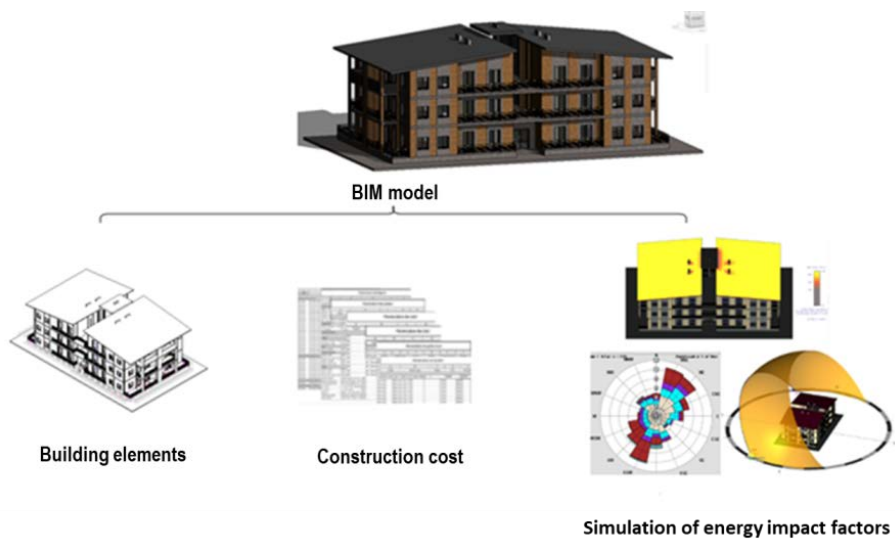


Figure 6.2. *Internal factors for assessing the value of a property*



Figure 7.1. *Principle of semantic segmentation*

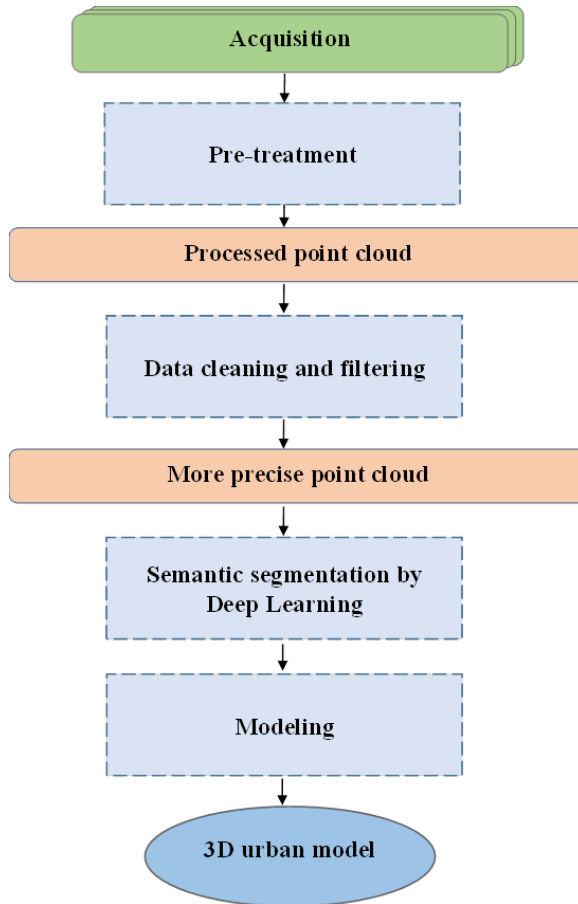


Figure 7.2. *The process of creating a 3D urban model from LiDAR point clouds*

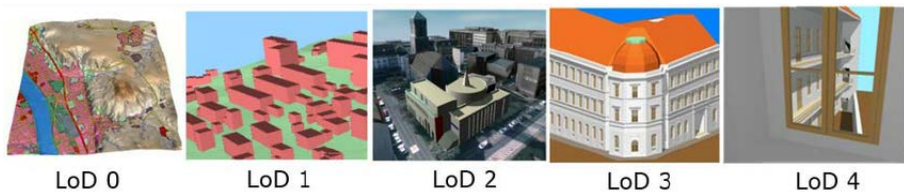


Figure 7.3. *The five levels of detail (LOD) defined by CityGML (OGC, 2012)*

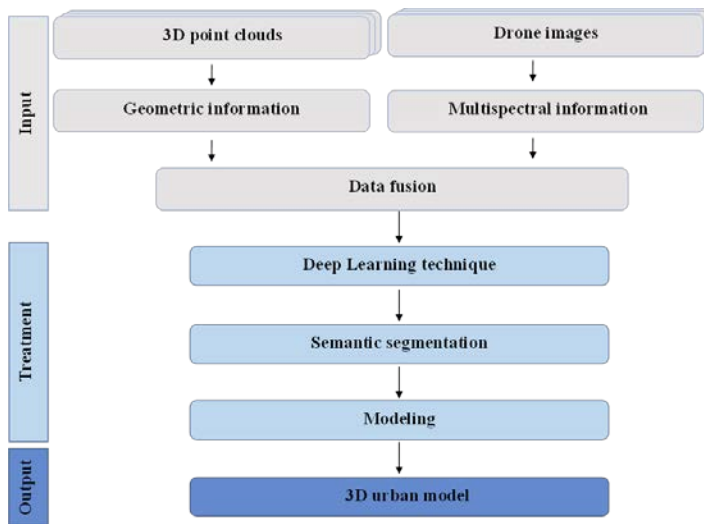


Figure 7.4. *General methodology of our approach*