

BIRGIT BIM and GIS integration
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L2 BIM-GIS Integration overview

Author(s) email



LEARNING OUTCOMES

At the end of this submodule, the participant is expected to be able to:

- Explain the basic concept and main properties of BIM GIS integration.
- Understand different scale of BIM and GIS.
- Know particular properties of BIM and GIS.

BIM-GIS integration – overview

BIM-GIS integration enables the **combination of attributes** and data from **two different perspective**; while BIM environment is more focused on 3D infrastructure information and data of a building with attribute information in detail, GIS data covers geographic aspect of the same area and its surroundings, underground utility network, semantic information and land usage information

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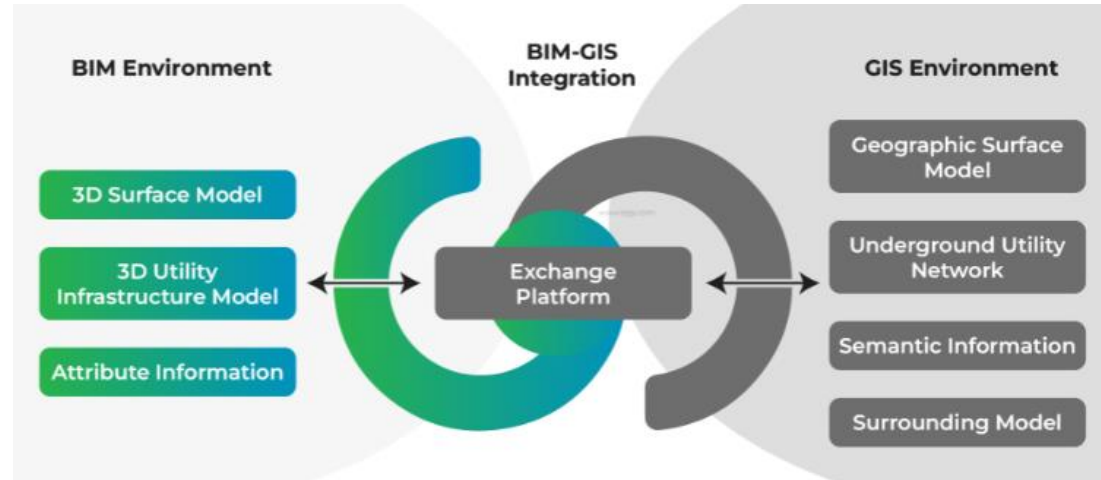


Image url: <https://www.tejy.com/integration-application-of-bim-and-gis-an-overview/>

BIM-GIS integration – the difference on the scale concept

In **GIS**, scale typically refers to **map scale**, which is the ratio of the map's linear dimensions to the corresponding dimensions on the Earth's surface. For example, a map scale of 1:10,000 means that one unit of measurement on the map represents 10,000 units on the ground.

GIS often involves **generalization**, where geographic features are simplified or abstracted to fit within a particular map scale.

Scale in GIS can also refer to the **geographic extent** of a dataset or map. For example, a GIS dataset may cover a city, a county, a state, or a larger geographic area, each with its own scale.

In **BIM**, scale is often expressed through the concept of **Level of Detail (LOD)**. LOD defines the degree of detail and accuracy at which building elements are represented within a BIM model. LOD ranges from LOD 1 (basic geometric shapes) to LOD 5 (highly detailed, as-built models).

The advancement of BIM is that a BIM model can **represent individual** buildings, construction projects, or specific building elements since the scale within a BIM model is tailored to the project's scope, focusing on the **details relevant to that project**

The most applicable scales of each GIS and BIM



Image url: <https://www.commercialdesignindia.com/insights/6112-gis-and-bim-integrating-two-of-the-most-disruptive-technologies>

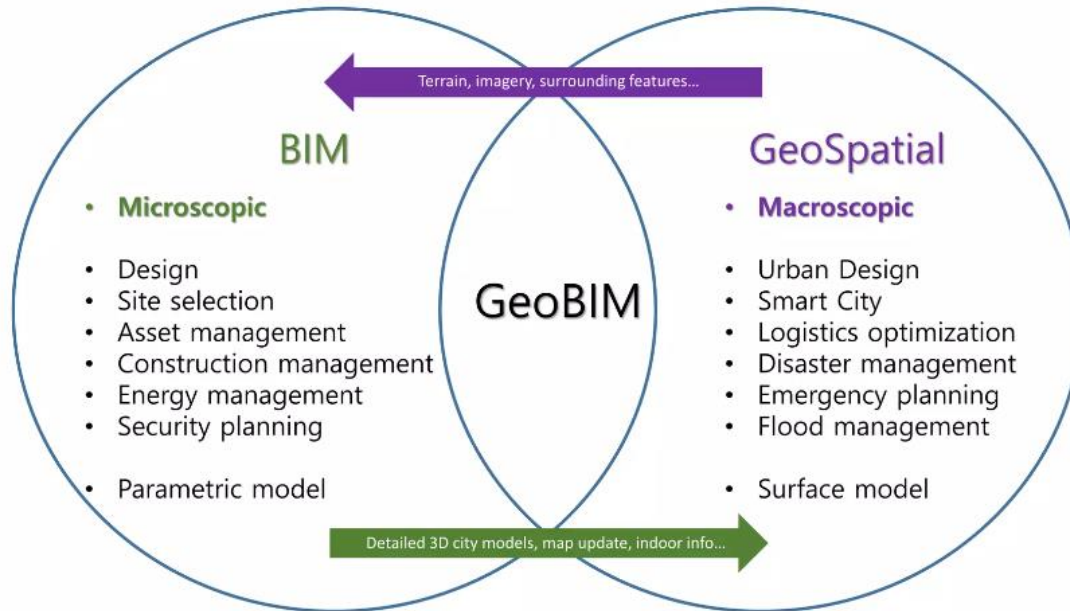


Image credit: Shanghee Shin, web url: <https://www.slideshare.net/endofcap/integration-of-bim-and-gis-from-ideal-to-reality>

1.2 Particular properties of BIM and GIS

GIS, with its proficiency in managing and analyzing geographic data, provides **contextual information**, such as location and topography, augmenting the spatial understanding within the integrated system.

BIM, characterized by its ability to capture and represent **detailed geometric and semantic information** about building elements, contributes to the richness and accuracy of the integrated dataset

BIM's emphasis on the entire life-cycle of a project complements GIS's geospatial analysis by incorporating **temporal dimensions**

The interoperability between BIM and GIS require leveraging their respective strengths

→ enables an enhanced decision-making, improved collaboration, and sustainable asset management throughout the lifecycle of built environments

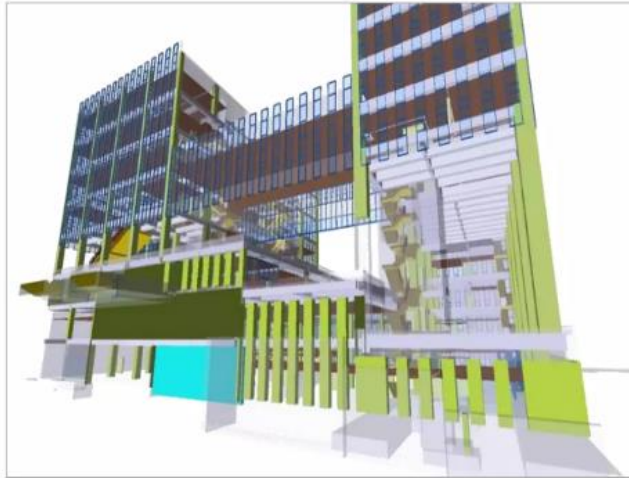
BIM

- ✓ Detailed Building Information
- ✓ Design and Construction Focus
- ✓ Interoperability
- ✓ Lifecycle Management
- ✓ Parametric Modeling
- ✓ Quantitative Analysis
- ✓ Visualization and Simulation
- ✓ Construction Sequencing
- ✓ Integration with IoT and Sensors

GIS

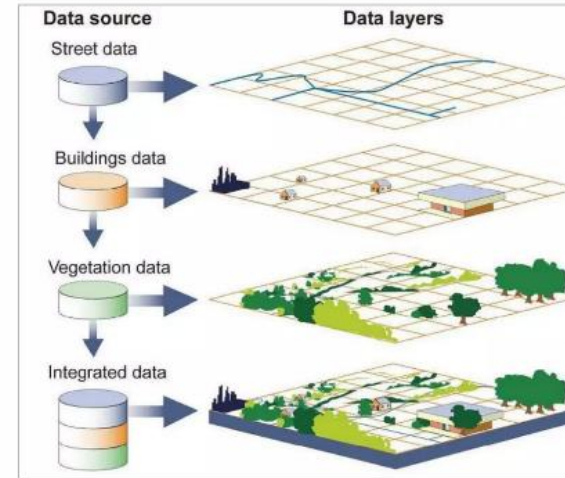
- ✓ Spatial Analysis
- ✓ Geospatial Data Integration
- ✓ Geographic Mapping
- ✓ Geodatabase Management
- ✓ Spatial Referencing
- ✓ Public and Environmental Data
- ✓ Emergency Response and Planning
- ✓ Zoning and Land Management
- ✓ Environmental Conservation
- ✓ Real-time Spatial Data
- ✓ Wide Range of Industries

BIM-GIS integration – particular properties - EXAMPLE



<BIM>

VS



<GIS>

Image credit: Shanghee Shin, web url: <https://www.slideshare.net/endofcap/integration-of-bim-and-gis-from-ideal-to-reality>

BIM-GIS integration – particular properties - EXAMPLE

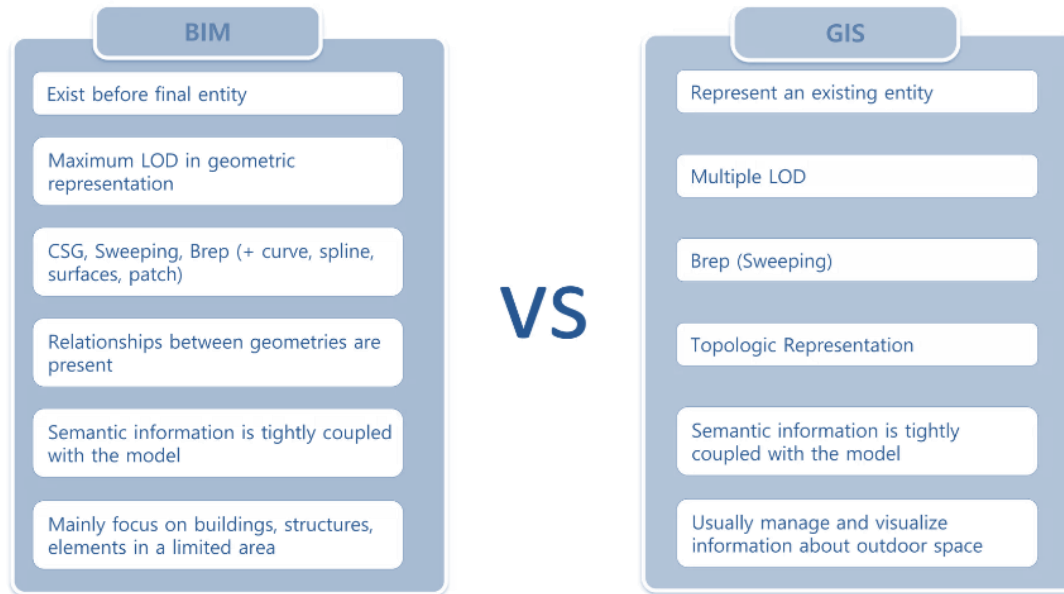


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