

Development of Structure-based Topology of 3D Spatial Databases for Storing and Querying 3D Cadastre Cases

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SUMMARY

In realizing 3D representation of 3D cadastre objects, the construction of 3D spatial databases requires a special attention. There are two approaches for building 3D database structures to represent 3D spatial objects, namely the geometry and topology-based structure database. The fundamental difference between the two structures is on their storage methods. The storage of spatial data with topology structures does not contain redundant objects. Therefore topological structure offers better data consistency. Meanwhile, geometry-based structure offers practicality in terms of data conversion. In this research, 3D database structure construction was developed using the application that enables topological structures on 3D spatial database with 2.5D approach. The implementation was done using PostgreSQL with PostGIS extension. The resulting data are used to solve 3D Cadastre cases by using spatial analysis tools in Geographic Information Systems (GIS) software. The resulting database was tested using queries that relevant to represent real world's 3D Cadastre cases. The analysis showed that the database with topology-based structure was able to solve some cases of 3D Cadastre that included the neighborhood relationship of the objects.