

REPRESENTATION OF CITYGML INSTANCE MODELS IN BASEX

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Abstract The Open Geospatial Consortium standard CityGML is an application schema of GML 3.1.1 for the representation, storage and exchange of semantic-rich virtual 3D city models. Here we assess the feasibility of storing, querying and updating CityGML models in the native XML database system BaseX. The features and performance of BaseX are compared with the implementation of the 3DCityDatabase which stores CityGML models in a relational database system. The results show that BaseX is a fast, flexible and intuitive tool to store and query even large CityGML documents. Its main advantage is the schema-oblivious storage mechanism that allows schema changes without changes to the database layout and the fast import and export of CityGML models. Using the 3DCityDatabase to manage CityGML data on the other hand is a better choice when spatial analysis and integration with third party software are demanded.

Keywords: CityGML · 3D city models · Native XML databases · BaseX

REVIEW AND ASSESSMENT OF CURRENT CADASTRAL DATA MODELS FOR 3D CADASTRAL APPLICATIONS

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Abstract Three-dimensional (3D) cadastres are often described as the 3D digital representation of real property rights, restrictions, and responsibilities (legal objects). They can also contain physical counterparts (physical objects) of legal objects such as buildings and utility networks, on, above or under the surface. Implementation of 3D cadastres requires many elements such as existing 3D property registration laws, appropriate 3D data acquisition methods, 3D spatial database management systems, and functional 3D visualisation platforms. In addition, an appropriate 3D cadastral data model can also play a key role to ensure successful development of the 3D cadastre. Many jurisdictions have defined their own cadastral data models. However, none of them can fully support the requirements of 3D cadastres. This paper aims to explore the theories and concepts of the most common existing cadastral data models and investigate how they manage 3D legal and physical data. The result of this research can be used by cadastral data modellers to improve existing or develop new cadastral data models to support the requirements of 3D cadastres.

Keywords: cadastral data model, land administration, core cadastral data model, e-plan model, basic administrative unit