A Proposed Architecture for Distributed and Version–Based Geospatial Data Sharing

Saeed Nadi (Iran)

SUMMARY

Developing systems to facilitate spatial data sharing have proven to be crucial for realizing e-government. A variety of organizations collaborate in land administration due to the diversity of activities in this business. In order to be able to adapt this various activities, it is required to enable organizations to share their data by utilizing appropriate frameworks and technologies. These frameworks and technologies assist the organizations in implementing seamless land administration. One of the most important parts of this framework is the facilities to share spatial data between these organizations, including legal rules and technical tools as a spatial data infrastructure. In this paper, a new spatial database architecture is proposed to utilize, update and analyze spatial data in a shared environment. The proposed model supports versioning of data and provides two level of quality control when an update introduced to data. Each update will firstly be applied on an isolated version named business version where will be checked to be acceptable regarding the business rules. Then accepted updates will be introduced to the second isolated version named technical version where will be checked to be spatially, topologically and cartographically true. After these quality controls the update will be released to be accessible by all the users. This ensures the accuracy, integrity and consistency of spatial database during distributed update process. A prototype system is developed to further investigate the proposed model. Distributed spatial database architecture is utilized for the development of the proposed model as the prototype system to satisfy data sharing in multi-unit organizations like municipalities. The implemented system is used and tested as an infrastructure in the Shahinshahr municipality near Isfahan metropolitan in Iran using more than 100 users over 200 spatially referenced layers. The paper finally explains that service oriented architecture of the system can resolve many issues relating to the shared utilization, updating and analyzing spatial data.

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