An Efficient Web-GIS Solution based on Open Source Technologies: A Case-Study of Urban Planning and Management of the City of Zagreb, Croatia

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Interoperability

- integration of spatial data from various sources (accuracy, consistency, coverage, lineage ...)
- integration of processing methods
- GIS tools – different vendors: companies (proprietary), OpenSource community, academic institutions
- common specification for:
  - data formats
  - processing methods

Generic web and webGIS application
Environmental data sources

- surveying, topographic and cadastral maps
- geological data, faults, landslides, geodynamics
- soil, water and air contamination
- green areas
- ...

City of Zagreb Case Study

- city level: Office for urban planning, environment and transportation
  - Department of environment, waste disposal and water management
- national level: Environment Protection Agency
  - national list of indicators for air pollution, water, waste and other datasets
  - obligation for regular data upload
Project goals

- inventory list of various datasets collected at local level and delivered to national level
- unification of spatio-temporal information into a unique webGIS
- usage of the system for more objective decision making based on multi-criteria analysis (MCA), simulation preparation, emergency evacuation plans

Desirable situation ...

- Data is collected in the field and laboratory
- Data files are transferred to a central repository
- GIS database
- User applications
- Design Engineer
- Drafter
- Other Staff
Current situation ...

Elements of webGIS application

- data warehouse: PostgreSQL/PostGIS
- application for mosaic making: Mapnik (used by the OpenStreetMap project)
- cache server: TileCache
- user interface: ExtJS/GeoExt/MapFish, OpenLayers
- data upload speed: at the level of GoogleMaps application (!)
Data modeling

Datasets

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Technical solution

Conclusions

- Case study confirmed the hypothesis that an Open Source solution is as efficient as any proprietary/commercial application.
- Usage of indexed mosaics is essential for effective visualisation of spatial data about the environment coming from different sources.
- Open Source components are highly independent and can be combined at will, according to user needs.
Future challenges

- implementations of WPS (Web Processing Services)
  - statistical analysis of environmental data acquired at daily rate as a function of webGIS
- preparation of simulations as a base for emergency situation management
- integration with existing webGIS applications of the City of Zagreb (local government)