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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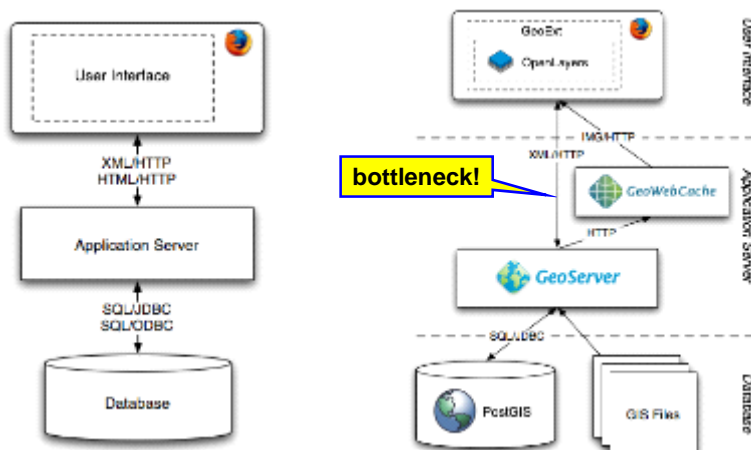An Efficient Web-GIS Solution based on Open Source: Zagreb Case-Study

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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

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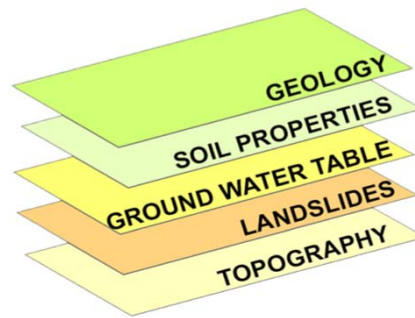# Generic web and webGIS application

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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
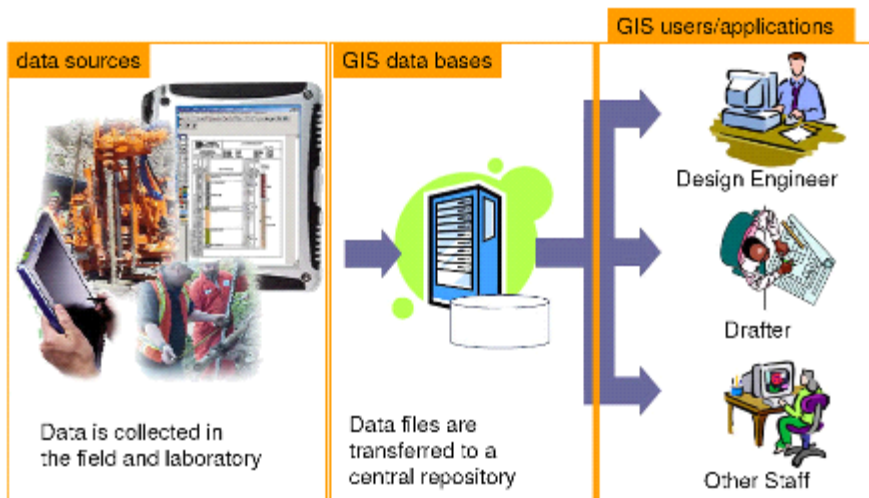 - obligation for regular data upload

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

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Desirable situation ...

GIS users/applications

data sources

GIS data bases

Design Engineer

Drafter

Other Staff

Data is collected in the field and laboratory

Data files are transferred to a central repository

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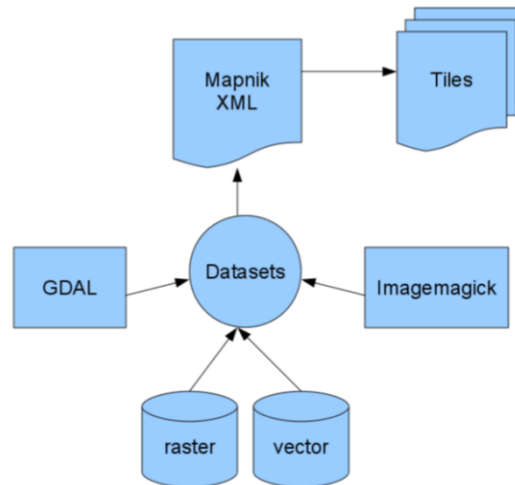
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Current situation ...

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

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Datasets

Layer	Type	Filesize	Tiles	Total
Digital ortophoto	Raster	600 MB	1.400.000	8 GB
Base Map	Raster	400 MB	1.400.000	7 GB
Topographic Map	Raster	300 MB	1.400.000	7 GB
Cadastre	Vector	80 MB	1.400.000	5 GB
Geology	Vector	10 MB	1.400.000	5 GB
Geodynamic	Vector	30 kB	GML	40 kB
Urban Planning	Vector	5 MB	1.400.000	5 GB
DEM	Raster	300 MB	1.400.000	6 GB

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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.

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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)

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