IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

Setting up a Social Cadastre

University of Szeged
Department of Physical Geography and Geoinformatics

06.21.2007, Brussels

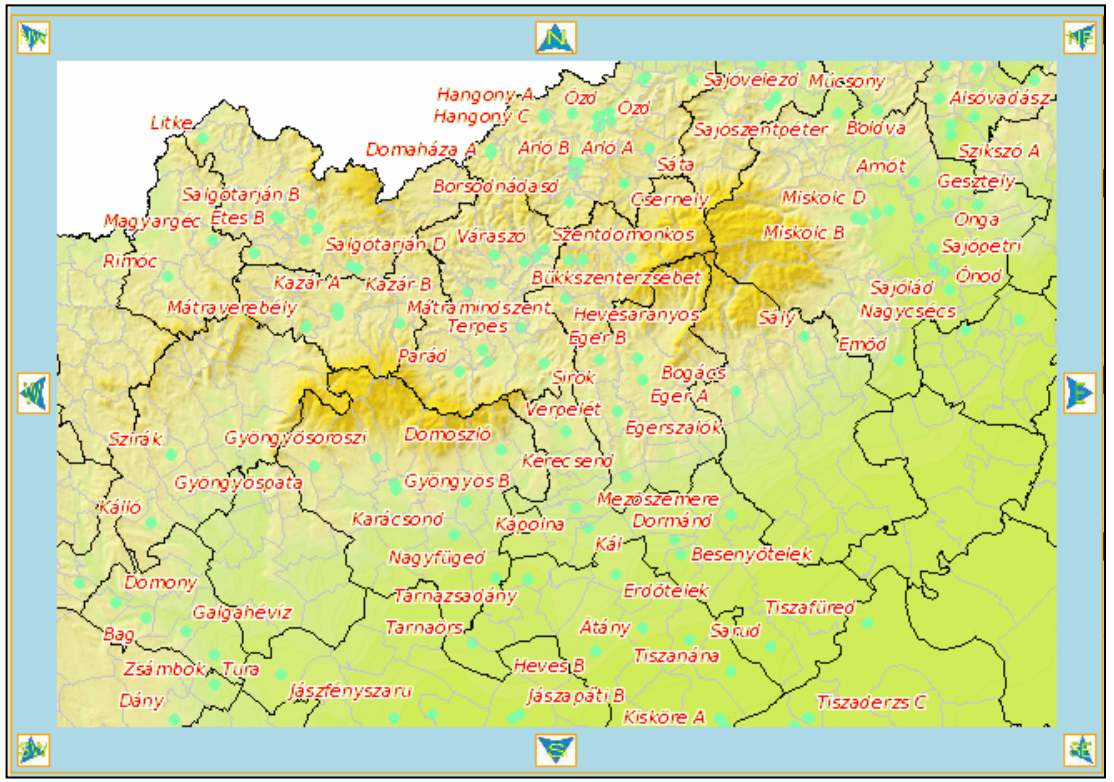
Attila Molnár
Tamás Piszák

Workshop on the IHLET Tisza River Development Program: A Cross-Border SDI Approach – "*From Local to Global*", European Parliament

IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

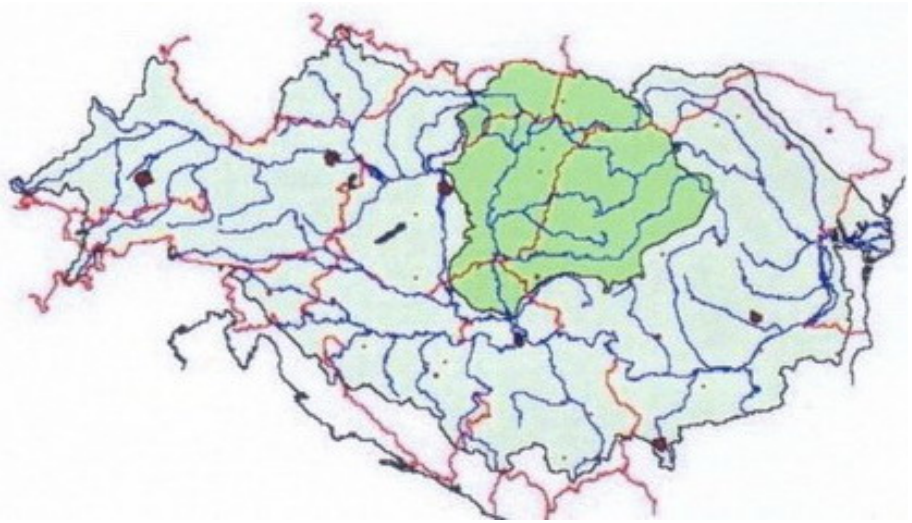
Topics

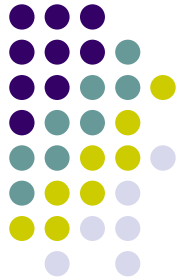
- Goal of the project
- Architecture
- Database
- Solution
- Standards, communication
- Metadata
- Security
- Connections



Goal of the project

- Development of the GI based information system for the IHLET Office's
- Diploma work of one of my GI students on the University of Szeged (Tamas Piszák)
- Development of a pilot project
- Possibilities of neutral information technologies in one multinational information system
- Design of an objective data capturing and management system
- Management of the datasets on the local level



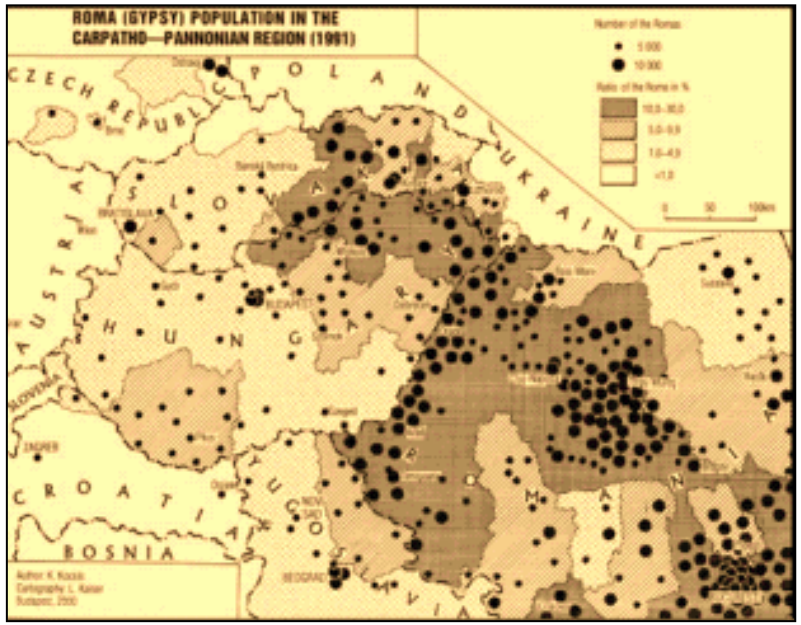


Goal of the project

- Design and development of a spatial geodatabase and information system, which use the national and international standards and technologies
- Setting up a web based GI infrastructure
- Scientific of the neutral IT solutions, with Open Source solutions and standards (multilingual system)
- Development an open and versionable IT structure
- Support of the NSDI and INSPIRE aims
- Support of the Metaadat technologies

Goal of the project

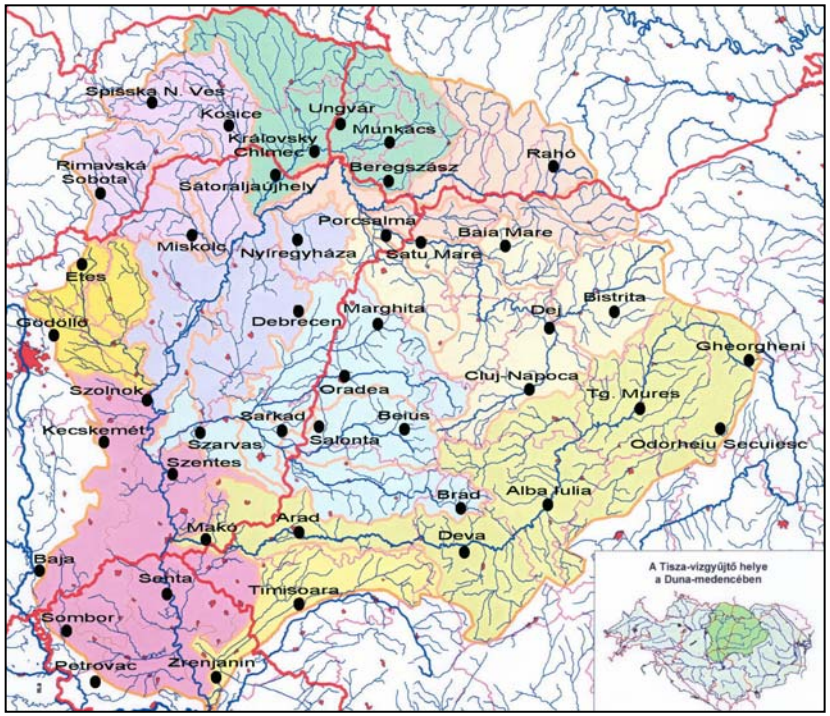
- The project objectives are relevant for accessing various kinds of EU Funds
- National GI Infrastructure is being strengthened in the region
- Focus is on regional scale and adding value
- Tools and GI information are becoming more common
- Synergy with others is a key condition
- Addresses the needs of the socially excluded



IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

Architecture

- The GI infrastructure will be managed on three levels
  - Centre - Tisza River Basin Region level
  - Node Points - National
  - Local Offices - Association at NUTS4 level
- The pilot GI system is able to manage the datasets in the three levels
- The solution is based on server-client applications
- The capture and update of the local datasets is on the local level
- The Region and National level is in the centre

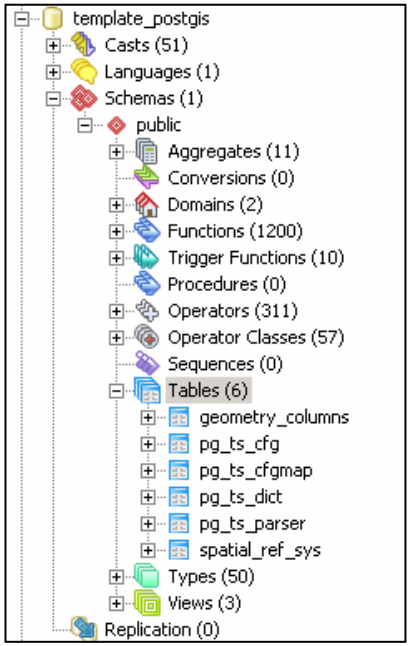


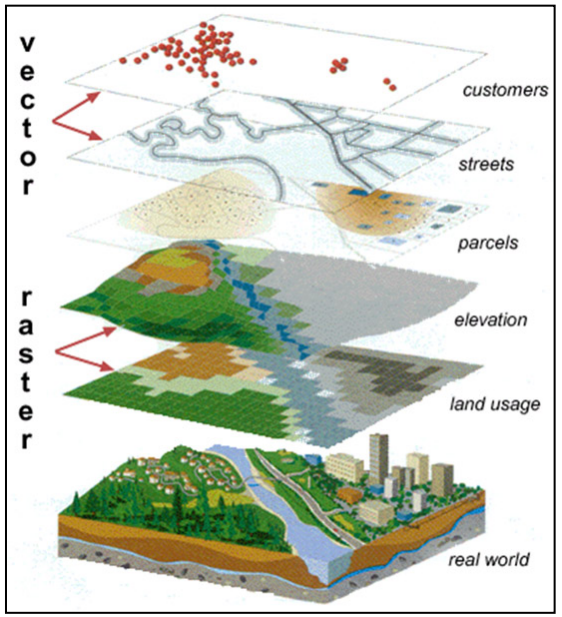
Database

- Pilot datasets
- Store the GI and alfanumerical datasets
- Shared databases
- Based on SQL server technology
- GI datasets
  - Spatial indexed datasets -> PostgreSQL (PostGIS)
- Alfanumerical datasets
  - PostgreSQL
  - MySQL
- Centre - Tisza River Basin Region level
  - Aggregated and generalized data
  - Data to cover gaps of the national GI infrastructure (orthophoto)
  - Added subjects: environmental, economic, social
  - Meta data
- Node Points - National
  - Aggregated and generalized data
  - Access to relevant national level thematic maps
- Local Offices - Association at NUTS4 level
  - Local large scale data: cadastre, utilities, urban planning, etc.

Database – GI datasets

- Pilot GI datasets
- PostgreSQL -> PostGIS datasets
- Vector data into spatial indexed database tables
- Relations between the databases on the different levels
- GI possibilities based on the PostgreSQL - PostGIS technology (use of different coordination systems)
- GI analysis with the PostGIS functions
  - Social analysis
  - Environmental analysis
  - Economic analysis

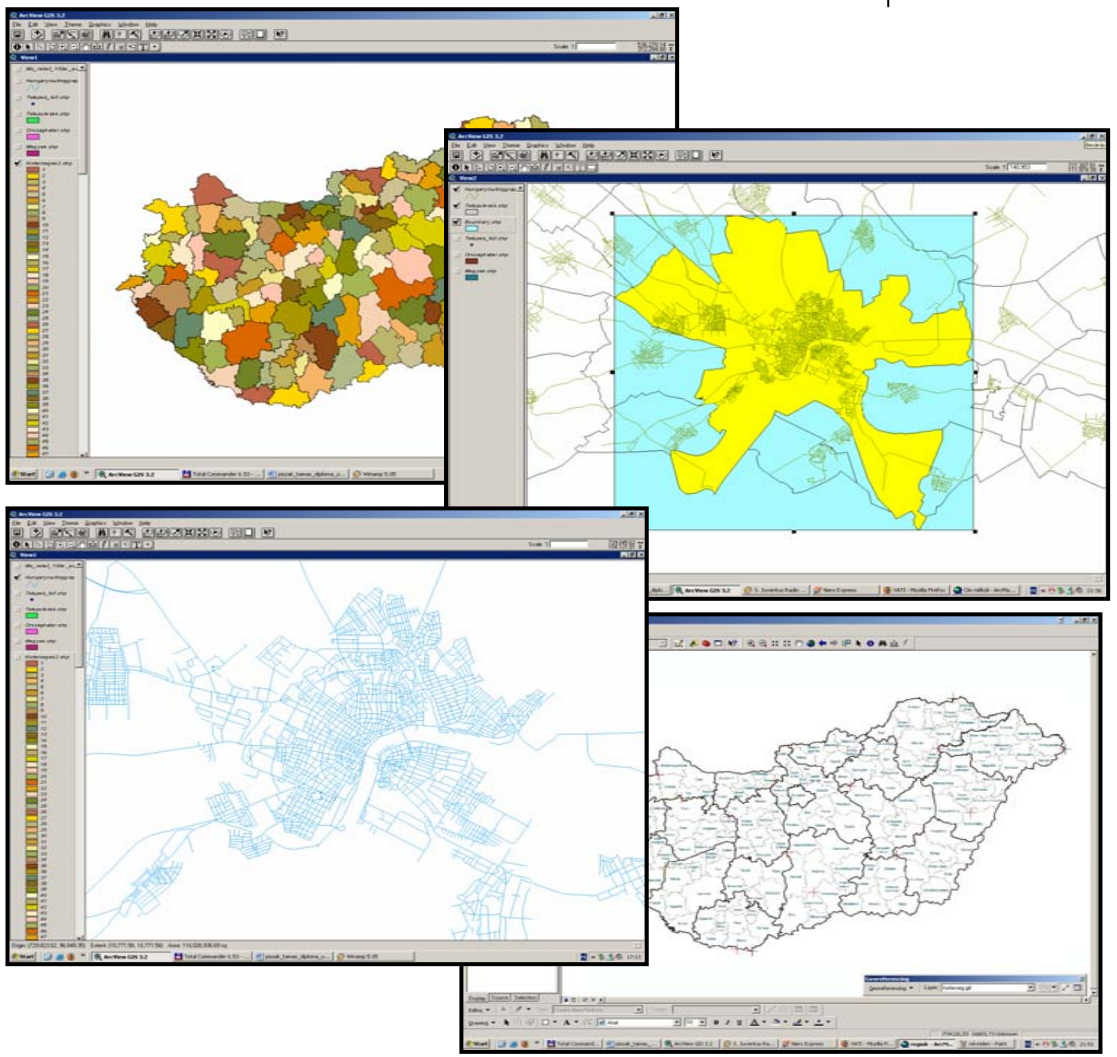




Database – GI datasets

- NUTS levels
- Place of the Roma population (slam)
- Network of the settlements
- Road network

- Possibilities
  - Digital elevation model
  - Orthophotos
  - Cadastre maps
  - Environmental datasets
  - Economical datasets
  - WMS services
  - SOAP based datasets
  - Aggregated and generalized data

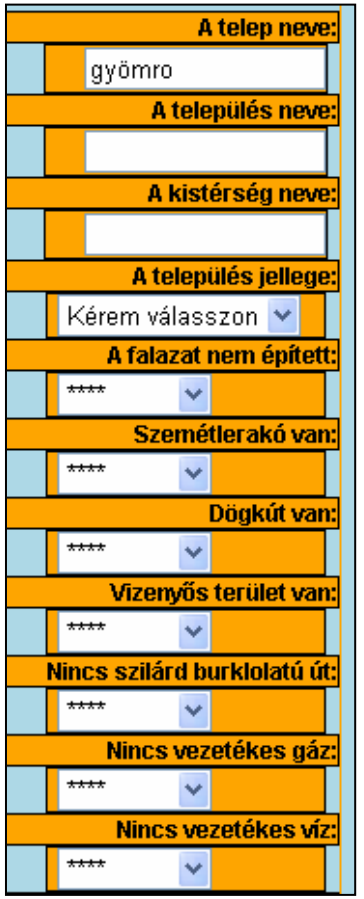


IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

Database – social data

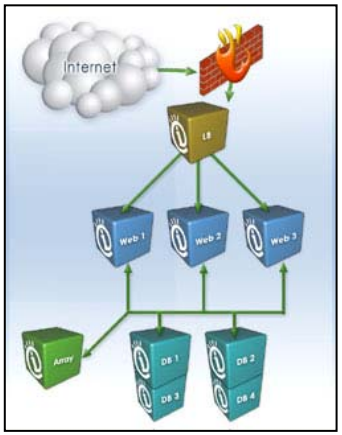
- Alfanumerical datasets (Roma population area)
- NUTS levels
- Local administration information
- Public services
  - Water
  - Electricity
  - Gas
- Roads
- Type of buildings
- Garbage collectors
- Population

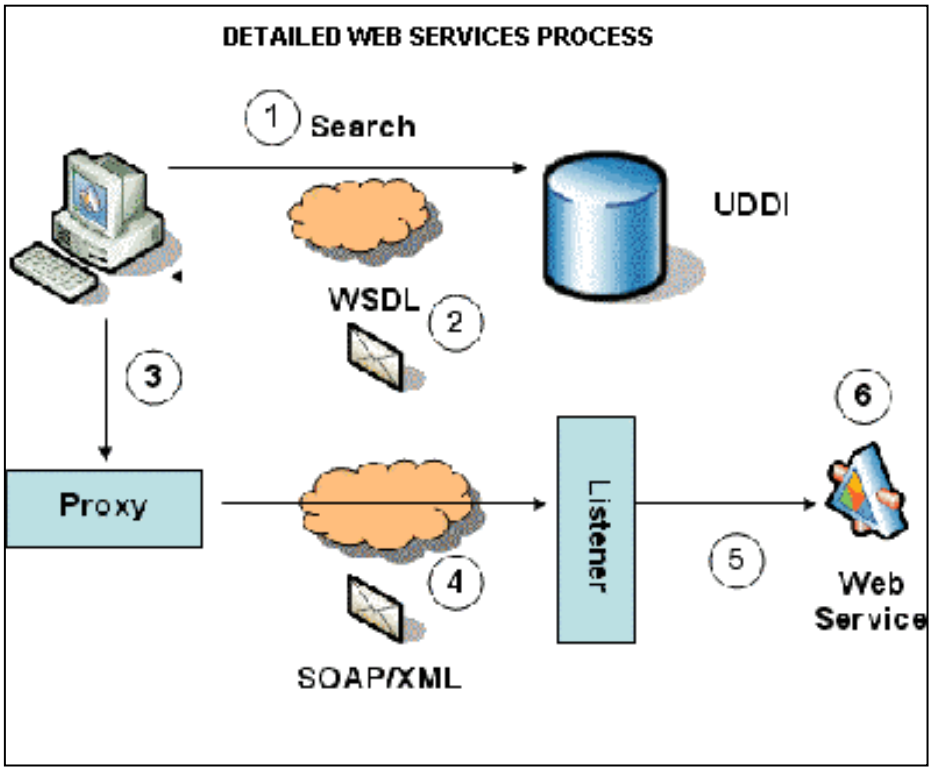
Név:	Település név:	Kistérség név:	Jelleg:	Falazat:	Szemétlerakó:	Dögkút:	Vizenyős terület:	Útburkolat:	Vezetékes gáz:	Vezetékes víz:	Csatorna:	Áram:	Lakosság:
Gyömro	Gyömrő	Gyáli	egyéb város	épített	nincs a telepen	nincs a telepen	nics a telepen	van a telep közelében	nincs a telepen	van a telepen	nincs a telepen	van a telepen	50 főnél több
Név:	Település név:	Kistérség név:	Jelleg:	Falazat:	Szemétlerakó:	Dögkút:	Vizenyős terület:	Útburkolat:	Vezetékes gáz:	Vezetékes víz:	Csatorna:	Áram:	Lakosság:



Solution

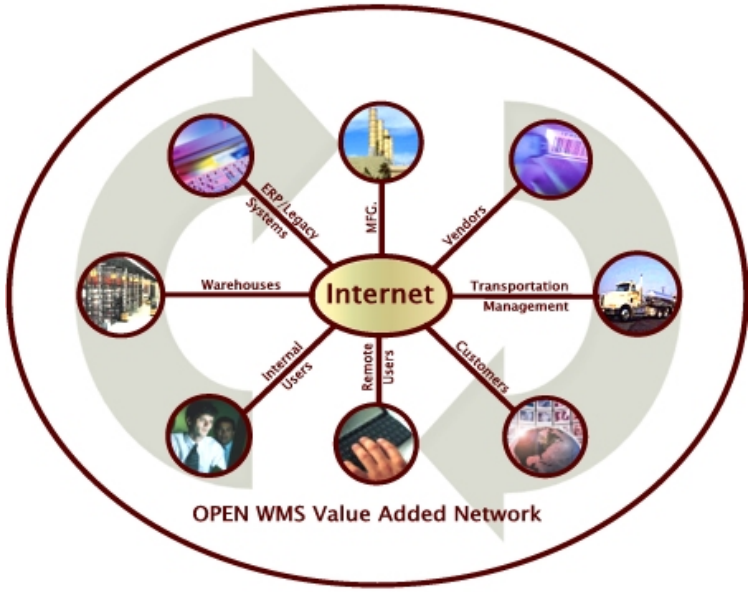
- Web Application
- Web Services to use the local datasets
- SOAP protocol
- WSDL
- UDDI
- Neutral data management with XML documents
- Connection between applications

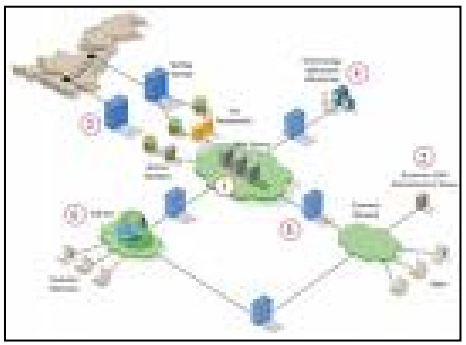


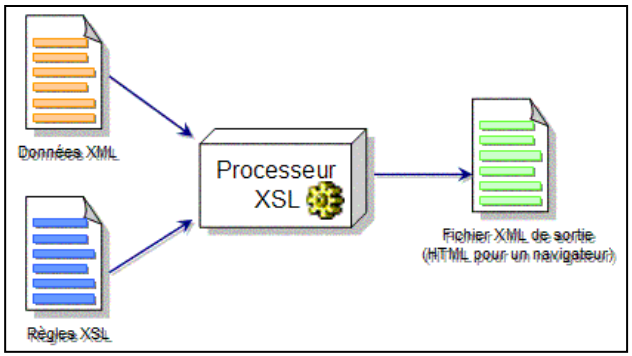


Solution - standards

- OpenGIS® Web Map Service
- GI dataset integrations with Web Services
- OpenGIS® Web Feature Service
- XML – GML based applications
- Conversion between XML documents

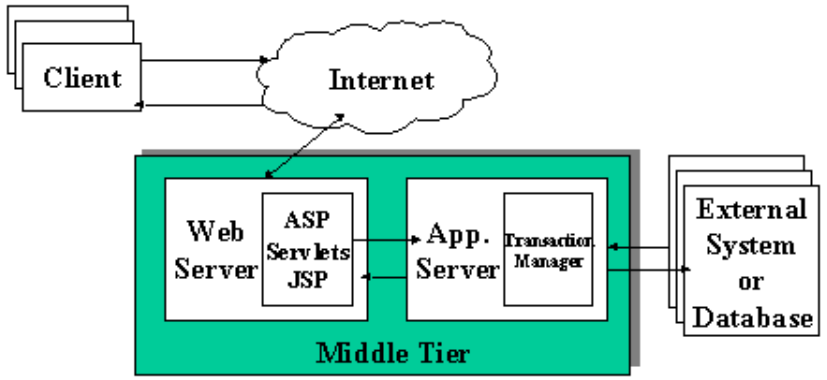






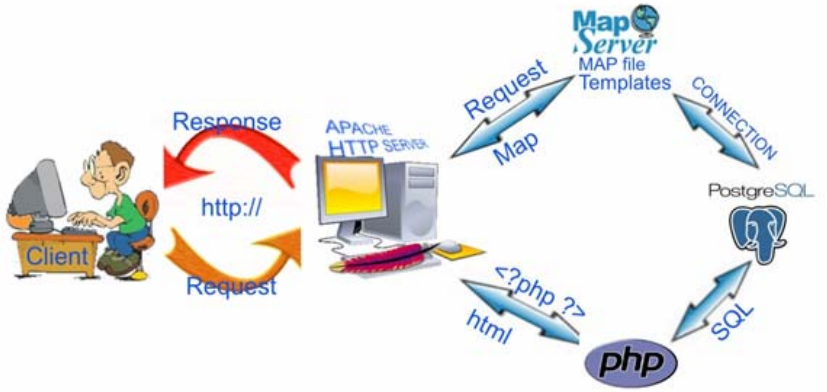
Solution – server side

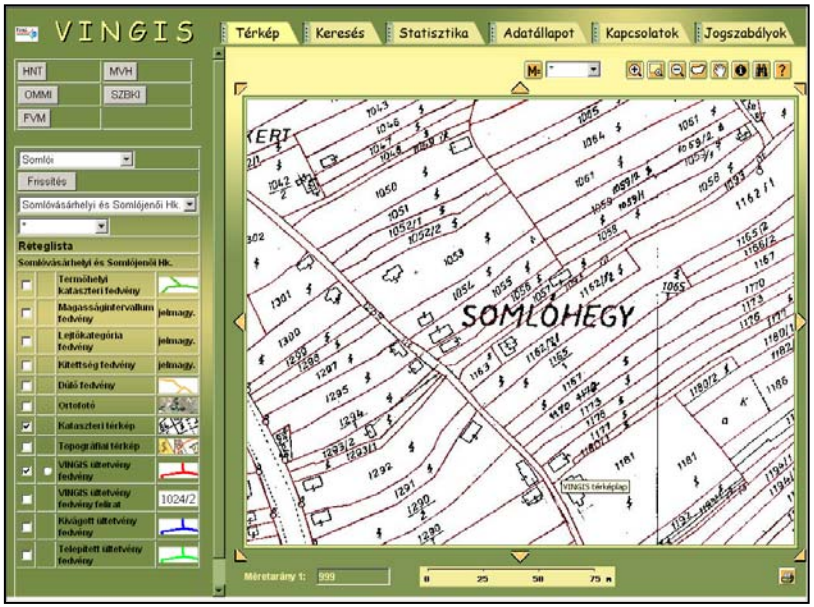
- Webserver
  - Publishing
  - Web content
- Application server
  - Business logic
  - Communication with the server machines
  - Support of the Web Services
  - Administration of the database
- Mapserver
  - Publication of GI datasets
  - Communication with mapservers (WMF standard)
- Database Management System
  - Store of the GI datasets
  - Alfanumerical databases



Solution - mapserver

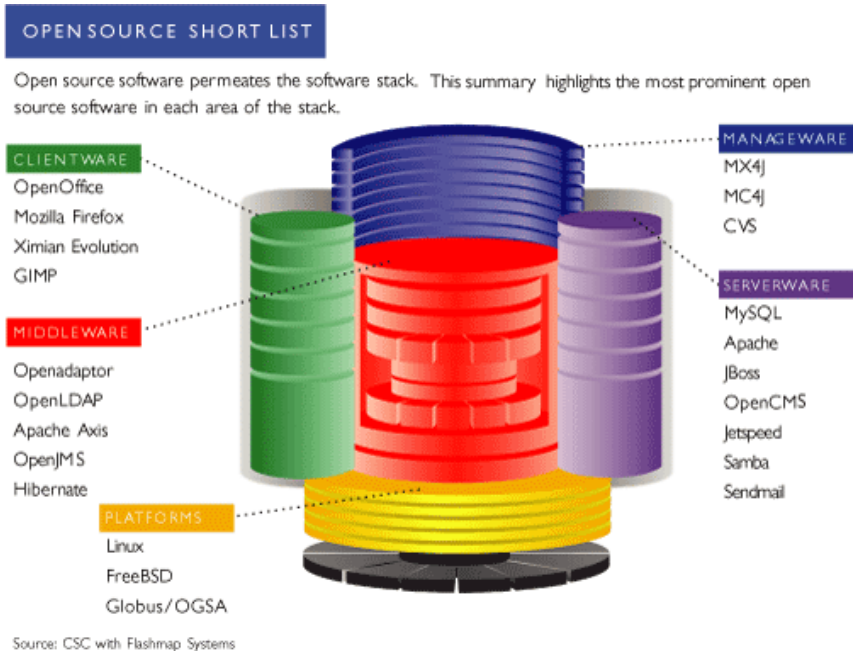
- GI dataset publication
- UMN Mapserver engine
- Open Source solution
- Publication of
  - Vector based GI datasets
  - Raster based GI datasets
- Request
  - Set of GI layers
  - Geographic extent
  - Publication settings
- Support of international and industrial standards
- High quality solution
- Use of GDAL library





Open source solutions

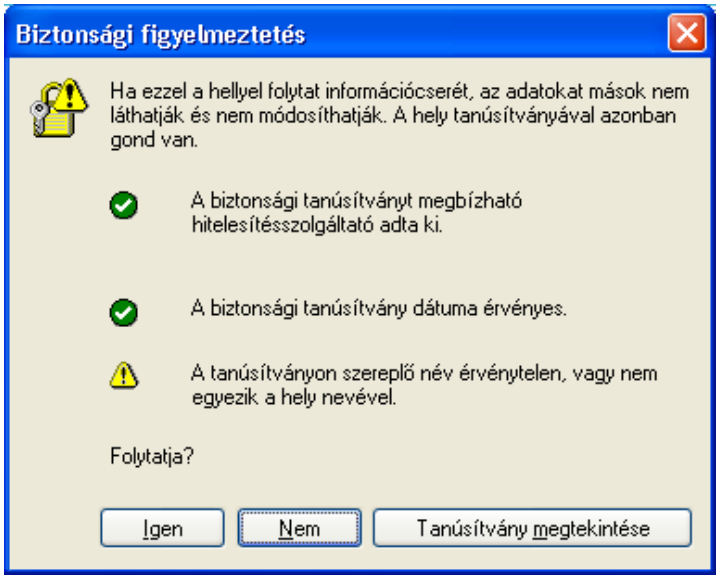
- Advantage
  - Well performed, the bugs are quickly repaired
  - Free, the source is available
  - Less backdoor
  - User forums, and active use groups
  - Support of the new technologies and standards
  - Good communication between open source software
- Disadvantage
  - Bad support
  - Some functions are uncomfortable
  - Development time is longer
  - Expensive experts

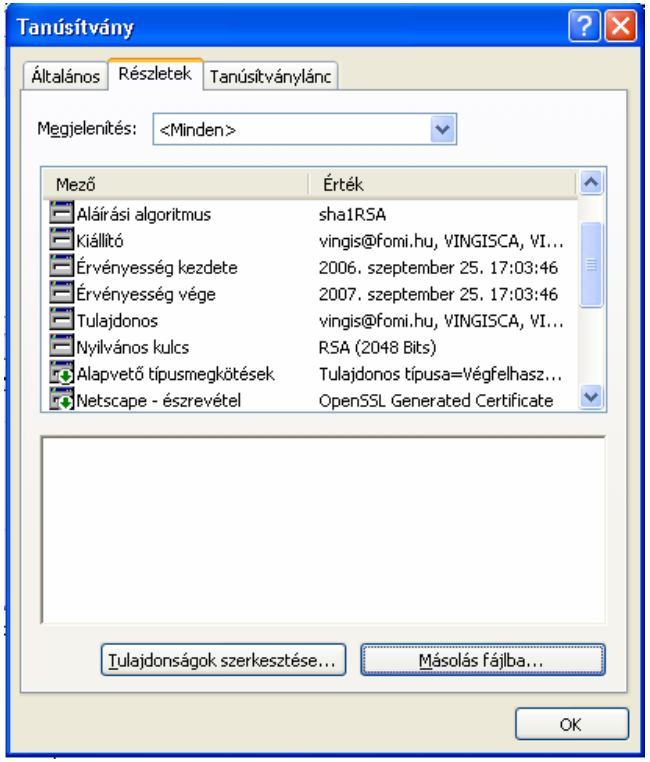


IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

Security

- Security of web applications
- Database security (DBMS)
  - User definitions
  - Web application user grants
- https protocol
- CA (Certificate Authority) -> web certificates





Metadata

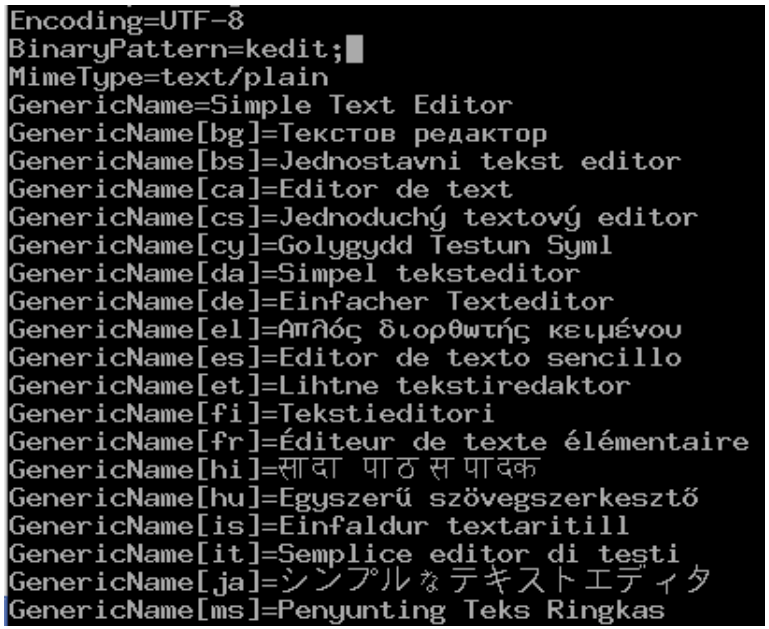
- Dublin Core Metadata Initiative
- FGDC geospatial metadata initiative
- Metadata of the GI datasets
  - Data source
  - Data quality
  - Responsibility
  - Minimum boundary
  - Scale, resolution
- Metadata of the alfanumerical databases
  - Type of the data
  - Description
- Web Services
  - WSDL definition
  - UDDI directory service
- XML definitions and metadata files

Dublin Core Metadata Initiative®
Making it easier to find information.

fgdc
FederalGeographicDataCommittee

Multilingual

- Multilingual user interface
- Multilingual database tables
- UCS (Universal Character Set), the ISO-10646 standard
- UTF-8 encoding
- UNICODE documents
- Support of national character sets
- Support in the GI datasets (PostgreSQL support)
- Support in the Web applications
- XML support

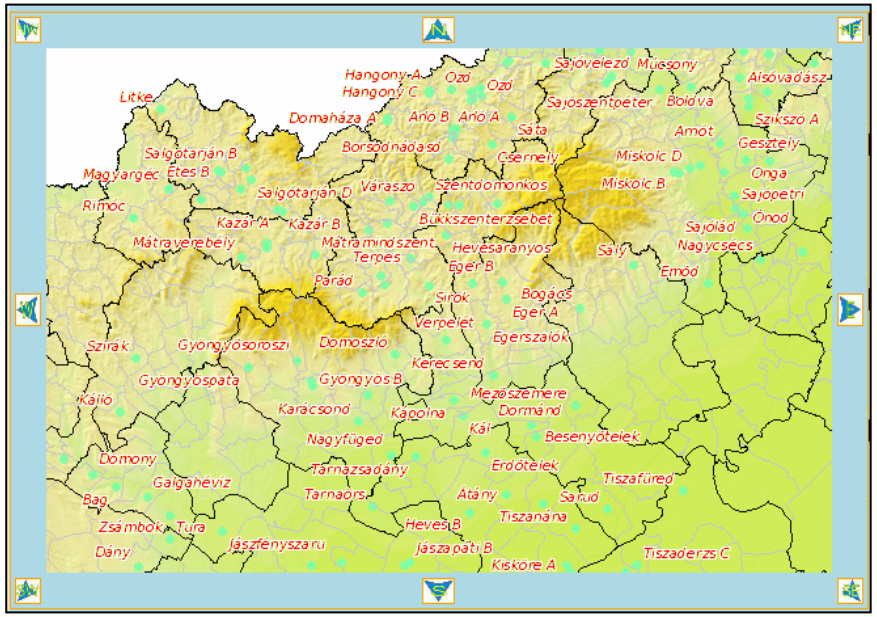


IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

Samples

Conclusion

- Support of the Ihlet Program and Ihlet Offices
  - Centre - Tisza River Basin Region level
  - Node Points - National
  - Local Offices - Association at NUTS4 level
- Possible connection with the EU Fund, local government and land government with the open standards and IT technologies
- GI based information system
- Support the NSDI
- Metadata possibilities
- Standards -> OGC, W3C, Web Services



IHLET
SZOCIÁLIS, KÖRNYEZETI ÉS GAZDASÁGI PROBLÉMÁK KÖLCSÖNHATÁSAIT KUTATÓ KÖZPONT KHT.

Setting up a Social Cadastre

Thank you for your attention!