Object Oriented Unified Real Estate Registry for a Good Spatial Data Management

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FIG Comm. 2., FIG Comm. 3., FIG Comm. 7, CGUWH, HSSMRS
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Introduction

- Unified Real Estate Registry
  - Legally from 1972 the geometric and legal part of real estate registry are handled by one administration, the Land Office Network
- Legal evolution
  - Act on Surveying and Mapping Activities (1996)
  - Act on Real Property Registry (1997)
- Technical evolution
  - MSZ 7772-1 Standard on Digital Base Map, Conceptual model (1996)

Cadastral IT developments

- TAKAROS
  - Real Estate Registry IS at District Land Offices
- INFOCAM/BIIR (in Budapest)
  - Integrated Real Estate Registry IS
- META
  - Information System for county level Land Office activities
- FÖNYIR
  - Land User Registry IS based on TAKAROS system
- All ISs are maintained by FÖMI

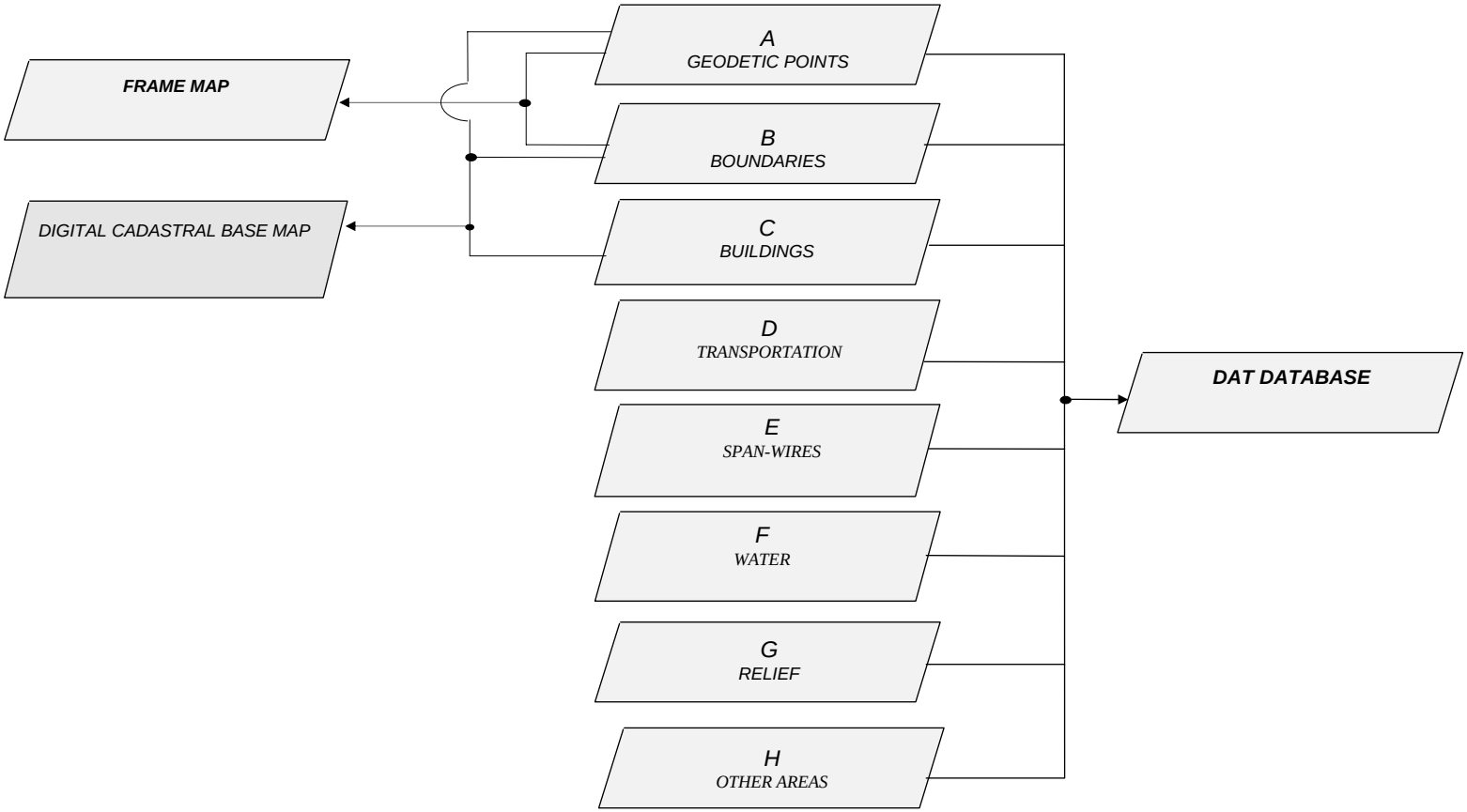
Evolution of data

- The legal part of real estate registry has been available in digital form since 1994
- Cadastral map data
  - In land compensation program approx. 50% of rural area has been digitized
  - National Cadastral Program (later)

DAT standard and its Instructions

- MSZ 7772-1 (DAT) standard defines an object oriented database scheme based on the CEN TC287 GIS pre-standards
- Object structure of the standard satisfies not only the needs of a cadastral database, but also the requirements of a general LIS database

Thematic structure of DAT database



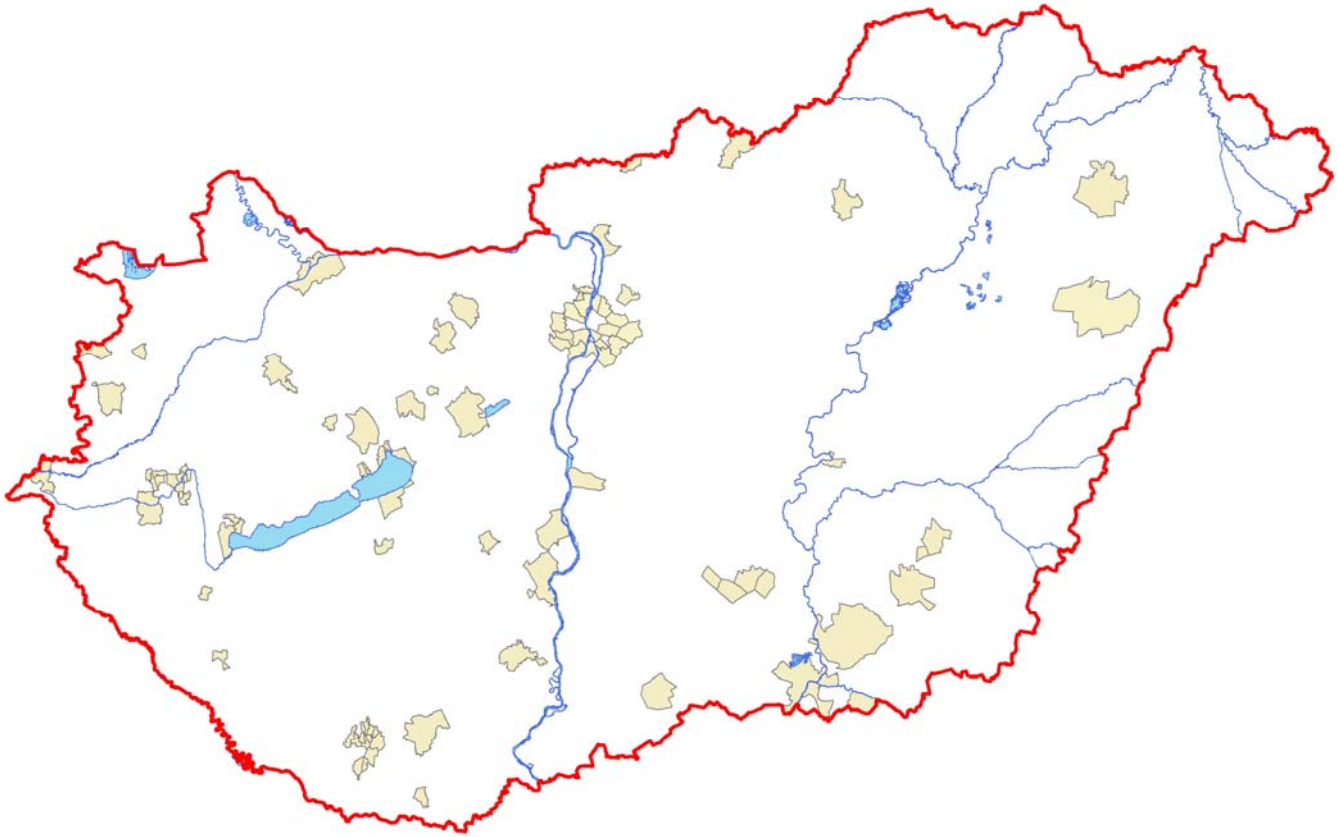
DAT instructions

- DAT instructions contains:
  - All the definitions, regulations, procedures belong to the creation, quality check, maintenance of a cadastral database based on DAT standard
  - The definition of a logical model and a data exchange format of a cadastral database defined by the standard

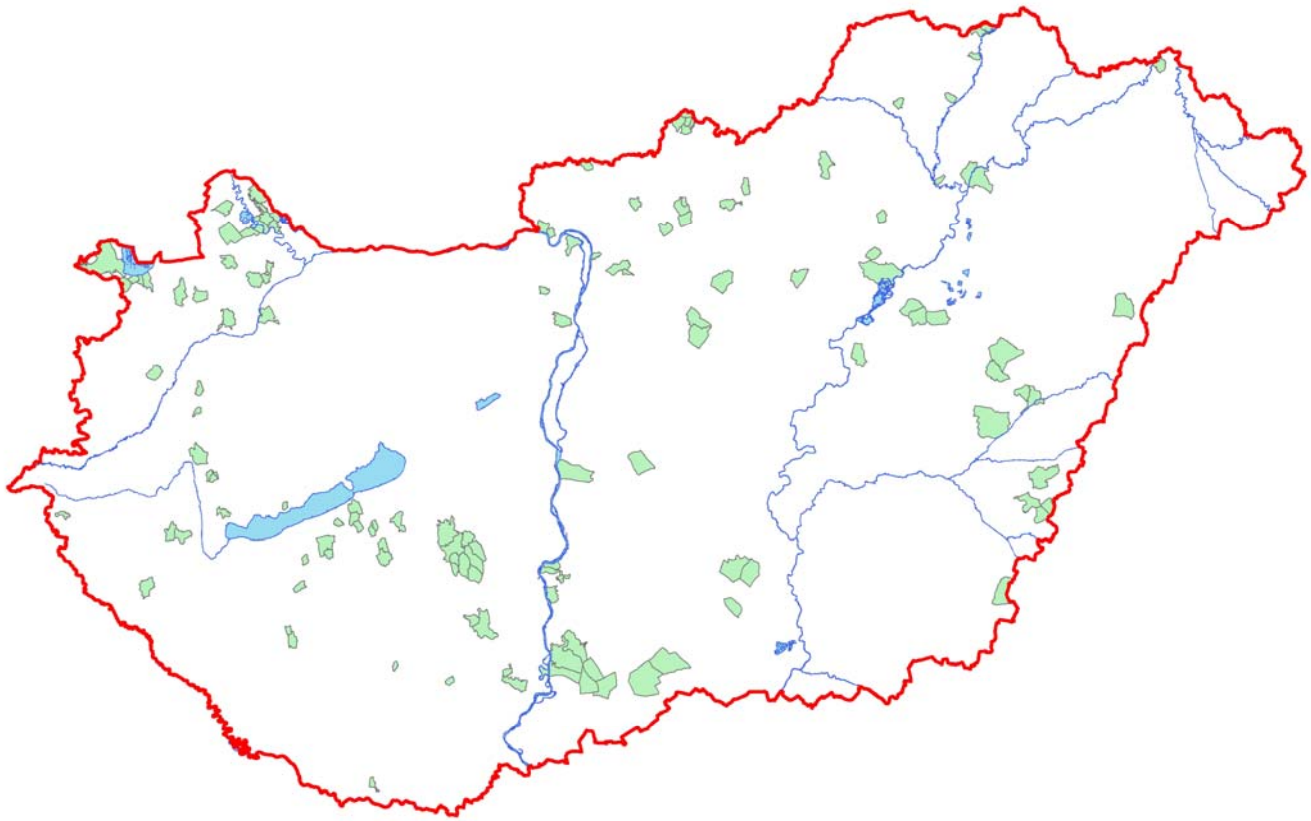
National Cadastral Program

- Three huge project organized by the National Cadastral Program Non-profit Company:
  - Establishment of DAT databases for 97 settlements (approx. 550 000 ha)
  - KÜVET: vectorization of cadastral maps of the rural areas of settlements (whole country), finished in 2005
  - BEVET: vectorization of cadastral maps of gardens and built-up areas of settlements (whole country), will be finished in 2007.

DAT databases



DAT databases is being created within the frame of BEVET



Current situation

- There are DAT databases
- Vector format cadastral maps for rural areas of settlements
- All real property legal data are organized into an information system
- All available vector data (including databases) are harmonized with legal data

Question

Where are the tools, which manage the unified real property data in integrated way?

Solution I.

- National Cadastral Program Non-profit Company has made a software developed called DATView, which is supporting the state-acceptance, issuing, change management of DAT databases at the District Land Offices

Solution II.

- Our vision, a real, object oriented cadastral IT system
  - In the unified real property registry cadastral maps are the geometric attributes of land records
  - The system should provide an authentic updating of real property registry records and cadastral maps together
  - The developments should be independent of any commercial GIS software
  - The system should cover all the business procedure in Land Offices
  - The system should fit into the existing IT systems in Hungarian Land Management

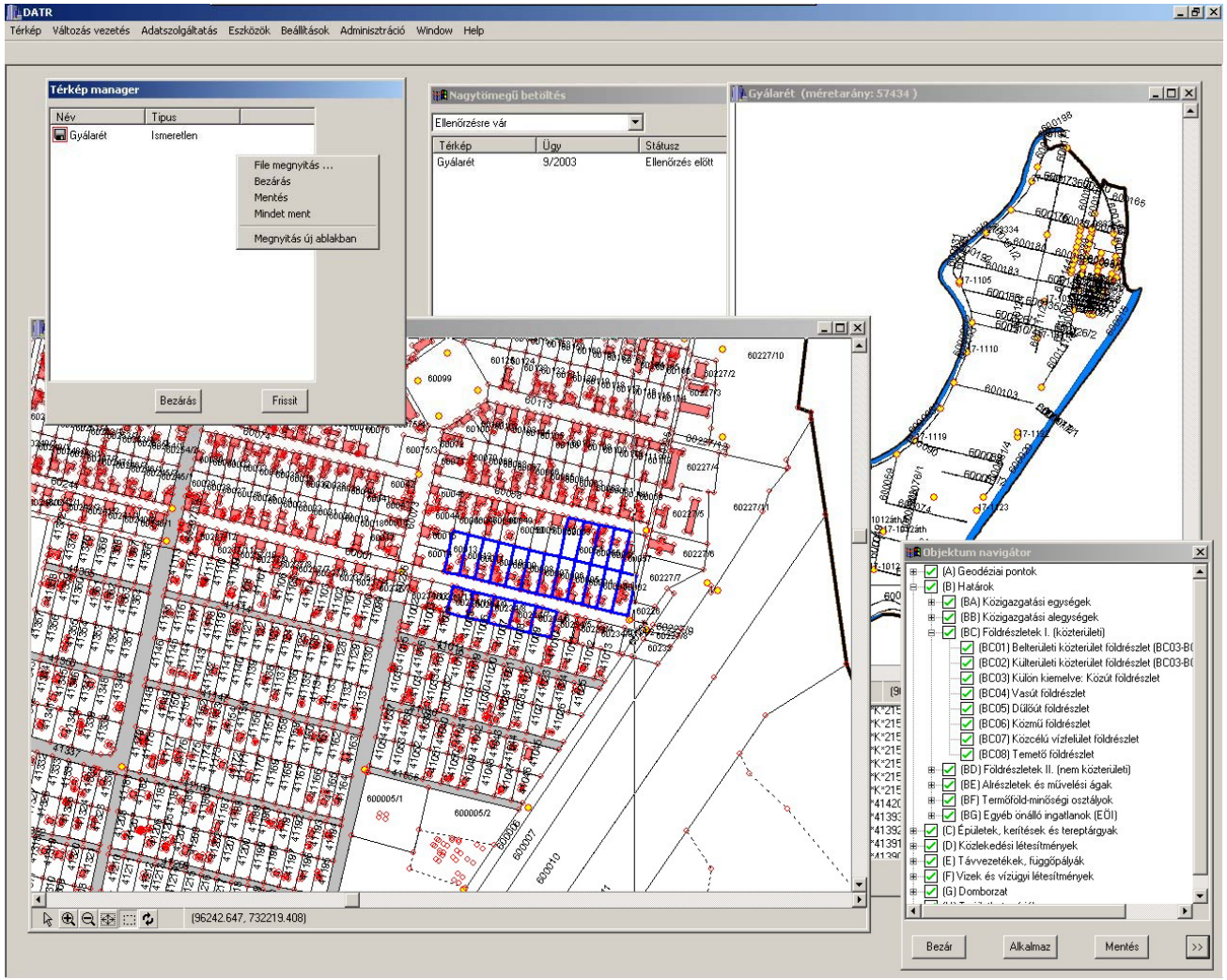
DATR (DAT based Mapping System)

- Total integration with the existing TAKAROS system
  - Database structure
  - Ability system
  - Transactions
  - Data service
  - System administration
- Uniform database structure with TAKAROS
  - One database scheme
  - Administration of changes
  - Enforcing database integrity
- Tracking of temporal changes
  - Archiving
  - Displaying any arbitrary status of cadastral maps
  - Background updating procedure

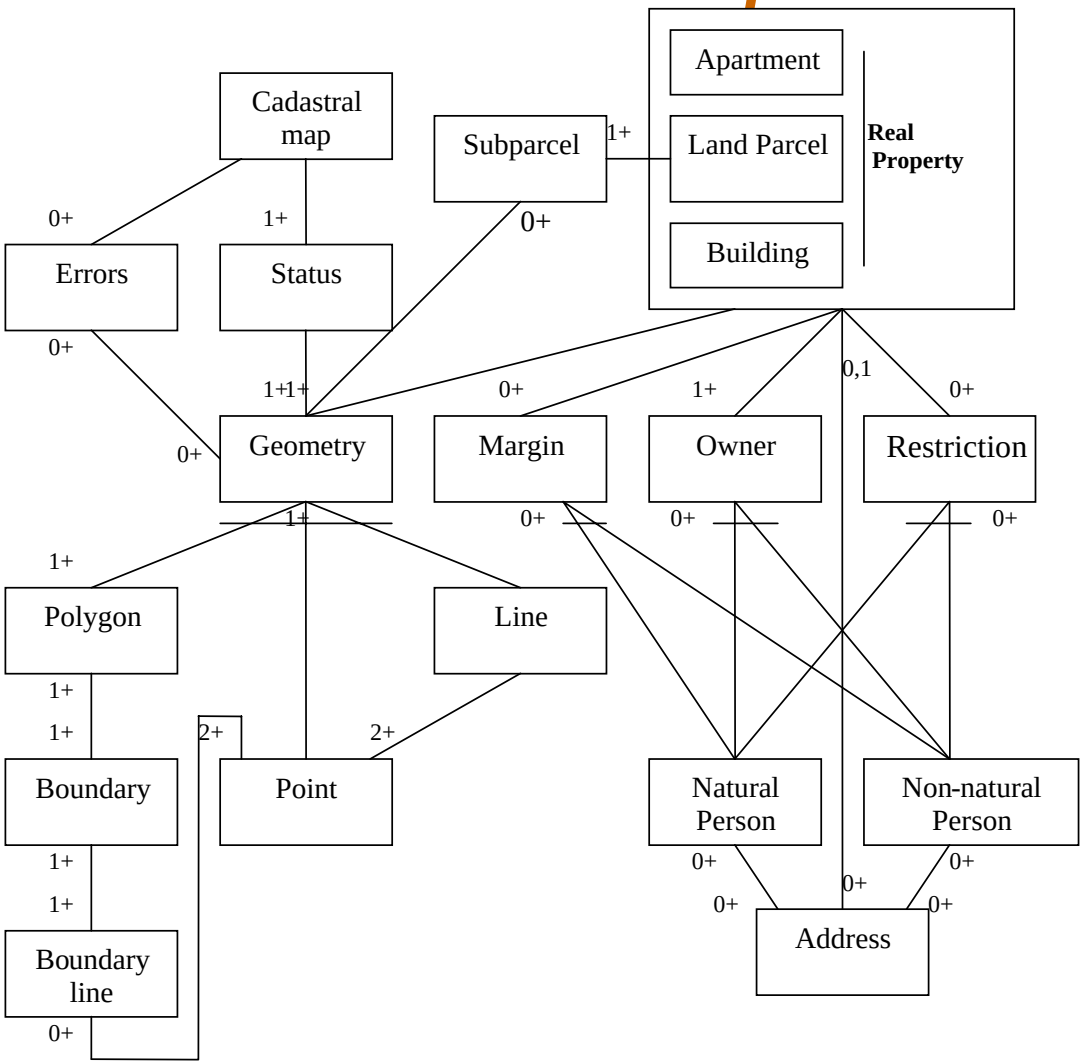
DATR (DAT based Mapping System)

- Real-time queries via TAKARNET network
  - Integrated search with the real property registry
  - Real-time map generation
  - Minimizing network weighting
- Modular, self-calibrating architecture
  - All the functions are in modules
  - Explicit and implicit communication among modules
  - No client side configuration needed for inserting any new module
- Easy expandable
  - Uniform calling interface and protocol
  - Usable base modules
  - Opened module API
- Operation system and RDBMS
  - Windows NT or 2000 client and server
  - ORACLE v8.05 RDBMS (see Land Offices)

Screenshot of DATR



Core data model of DATR



The core data model of DATR is conformed with the Cadastral Domain Model defined by our Dutch Colleagues

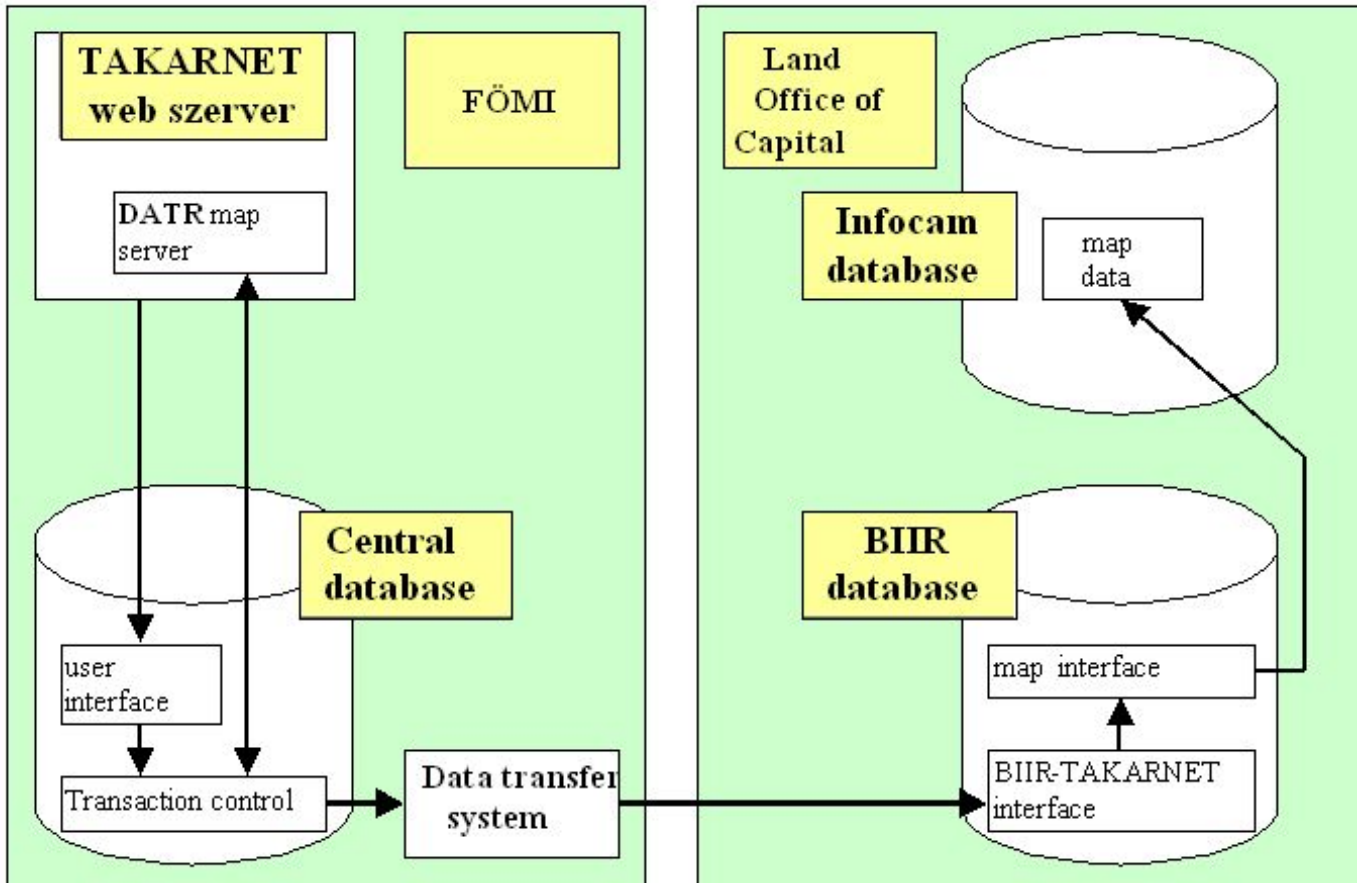
Land Information Services

- TAKARNET and its services
  - Land record services has been available since 2003 for registered users (lawyers, notaries, banks etc.)
  - Integrated land information services (land records and cadastral maps) has started in 2005 for the area of Budapest Land Office
  - Integrated services for rural areas of settlements are available from this month (see KÜVET project)

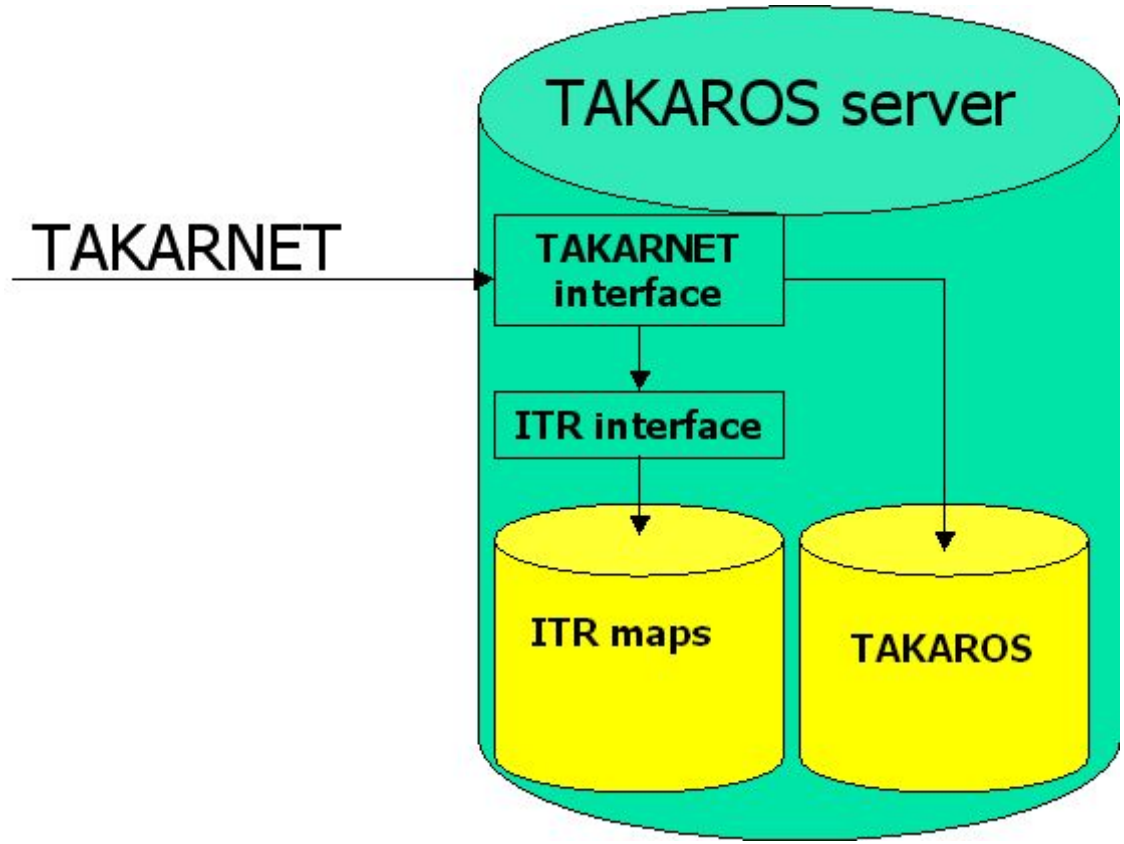
Integrated services

- The engine of integrated services is DATR
- Why?
  - Flexibility
    - Integrated services from DAT databases are the default
    - Services from different formats and databases (INFOCAM, ITR)
  - Effectiveness
    - Easy-developable system (modularity)
    - Knowledge base and independence

Architecture of INFOCAM service



Architecture of KÜVET service



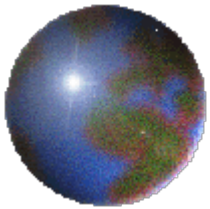
Conclusions I.

- Standardized mapping data greatly increase the effectiveness of developments and decrease the time needs of them
- Experiences and knowledge base on Unified Real Property registry also geared up the implementing of the IT system
- Our solution (DATR) showed that it was possible to develop a cadastral IT system with own sources, without any depending on commercial product

Conclusions II.

- DATR is a system, which flexible and effective enough to expand to the new IT challanges in Land Administration Sector
- The system is opened, and extendable for international connections, which are probably required in the near future (e.g. INPIRE)

Thanks for your attention



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