

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

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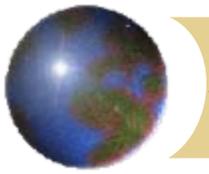
Institute of Geodesy, Cartography and Remote Sensing (FÖMI), Hungary



Workshop on e-Governance, Knowledge Management and e-Learning

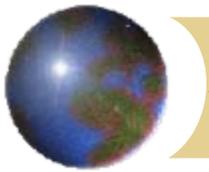
FIG Comm. 2., FIG Comm. 3., FIG Comm. 7, CGUWH, HSSMRS

27-29 April, 2006., Budapest, HUNGARY



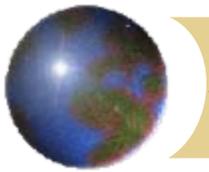
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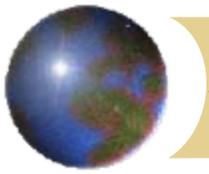
Introduction

- 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)



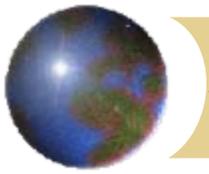
Cadastral IT developments

- 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



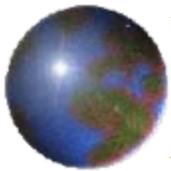
Evolution of data

- 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)

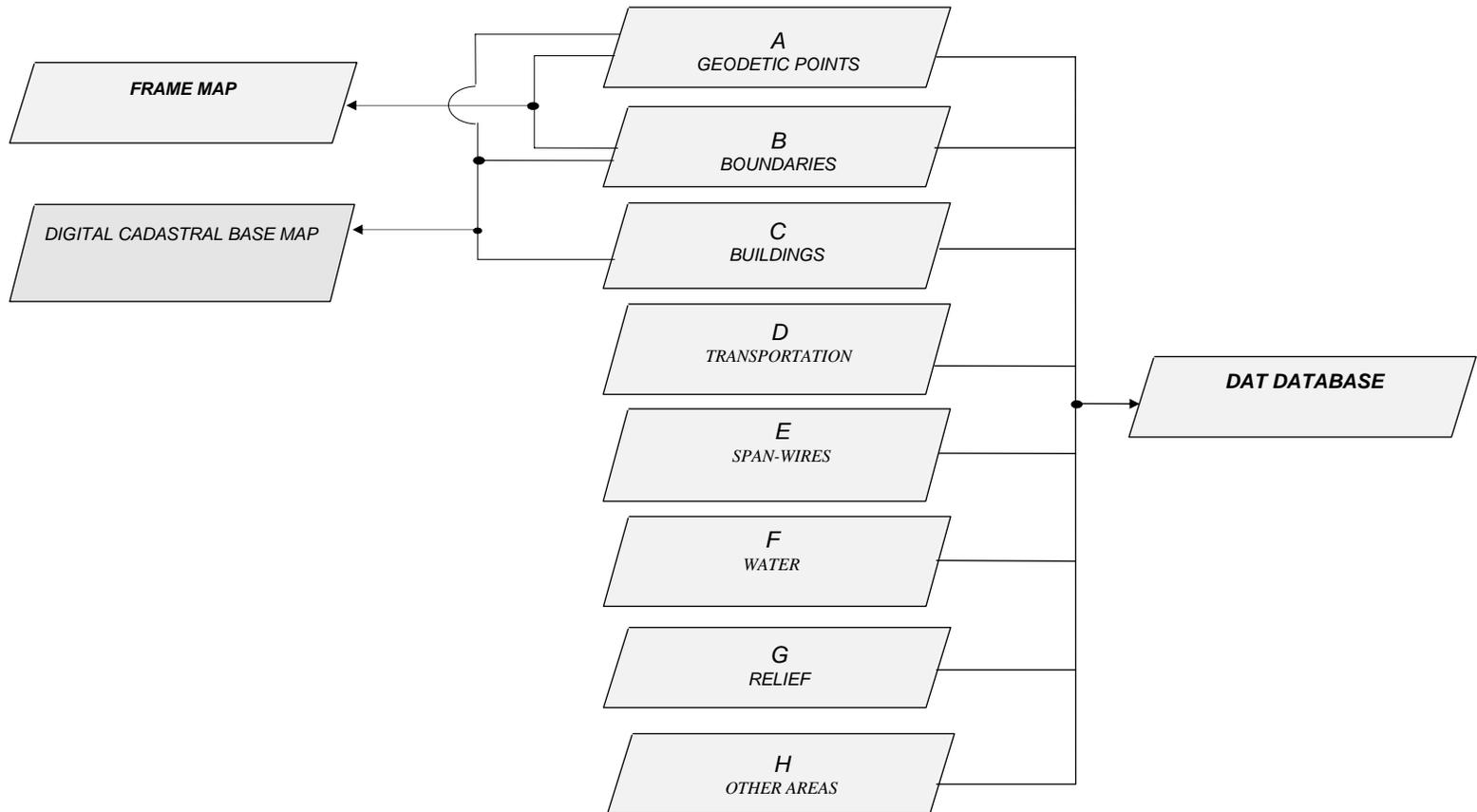


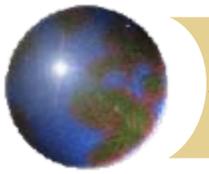
DAT standard and its Instructions

- 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



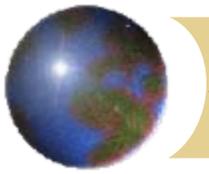
Thematic structure of DAT database





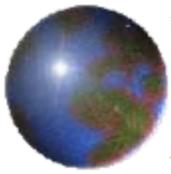
DAT instructions

- 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

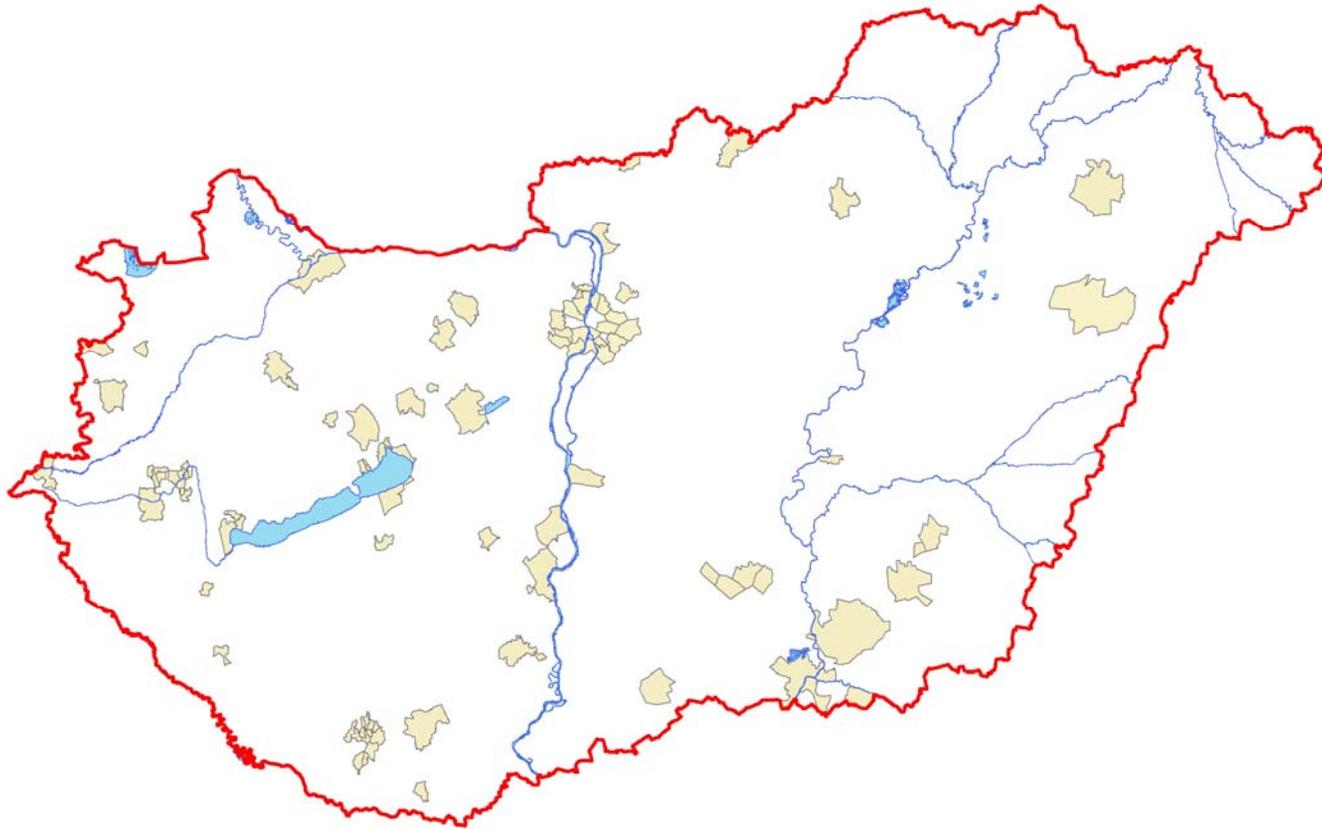


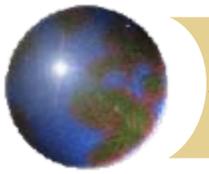
National Cadastral Program

- 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.

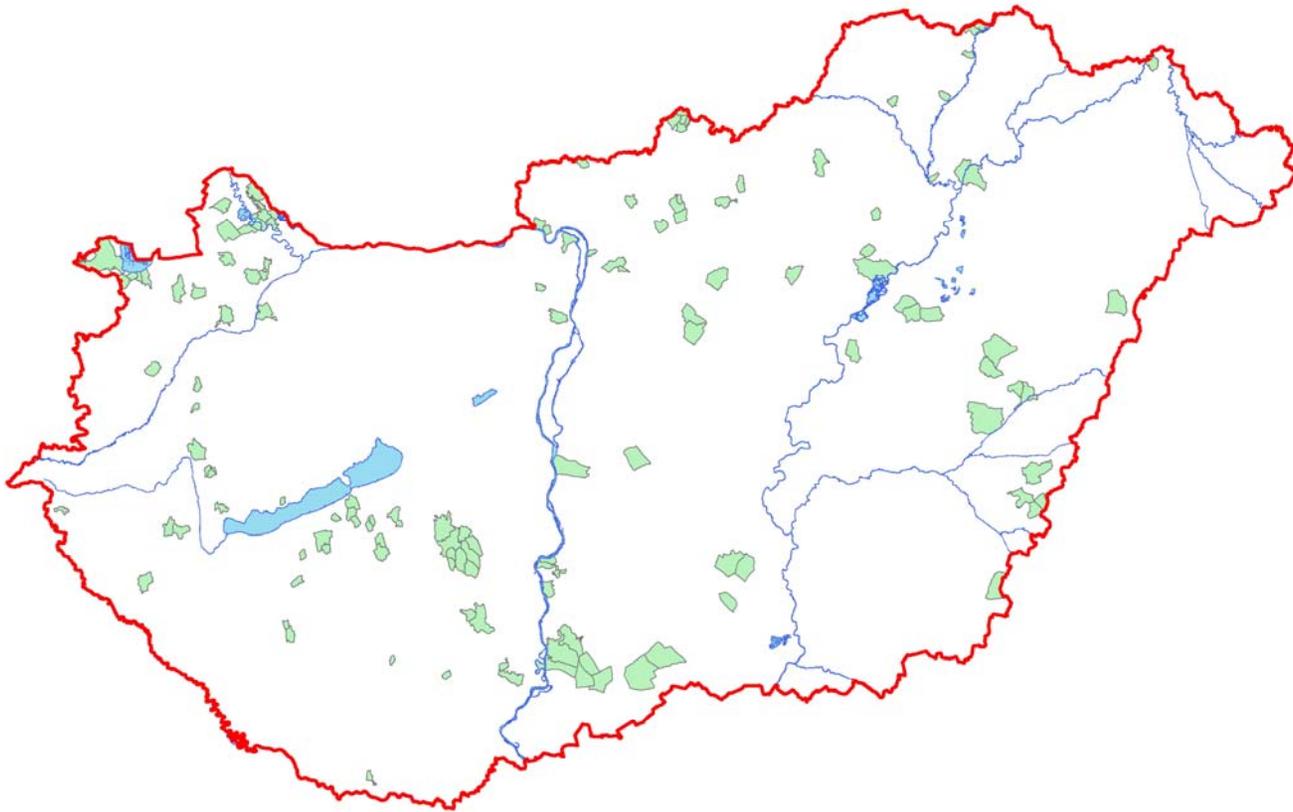


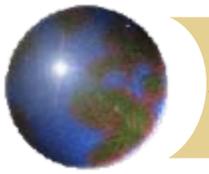
DAT databases





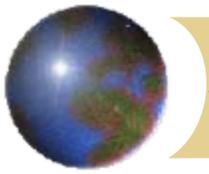
DAT databases is being created within the frame of BEVET





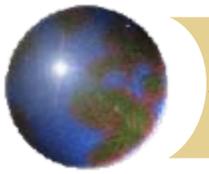
Current situation

- 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



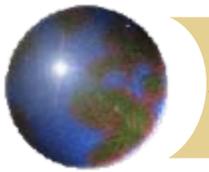
Question

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



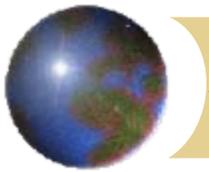
Solution I.

- 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



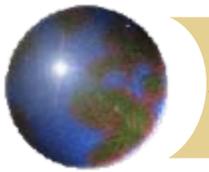
Solution II.

- 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



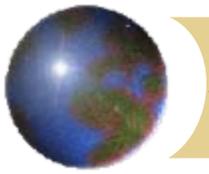
DATR (DAT based Mapping System)

- 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)



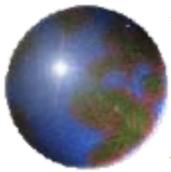
Screenshot of DATR

The screenshot displays the DATR software interface with the following components:

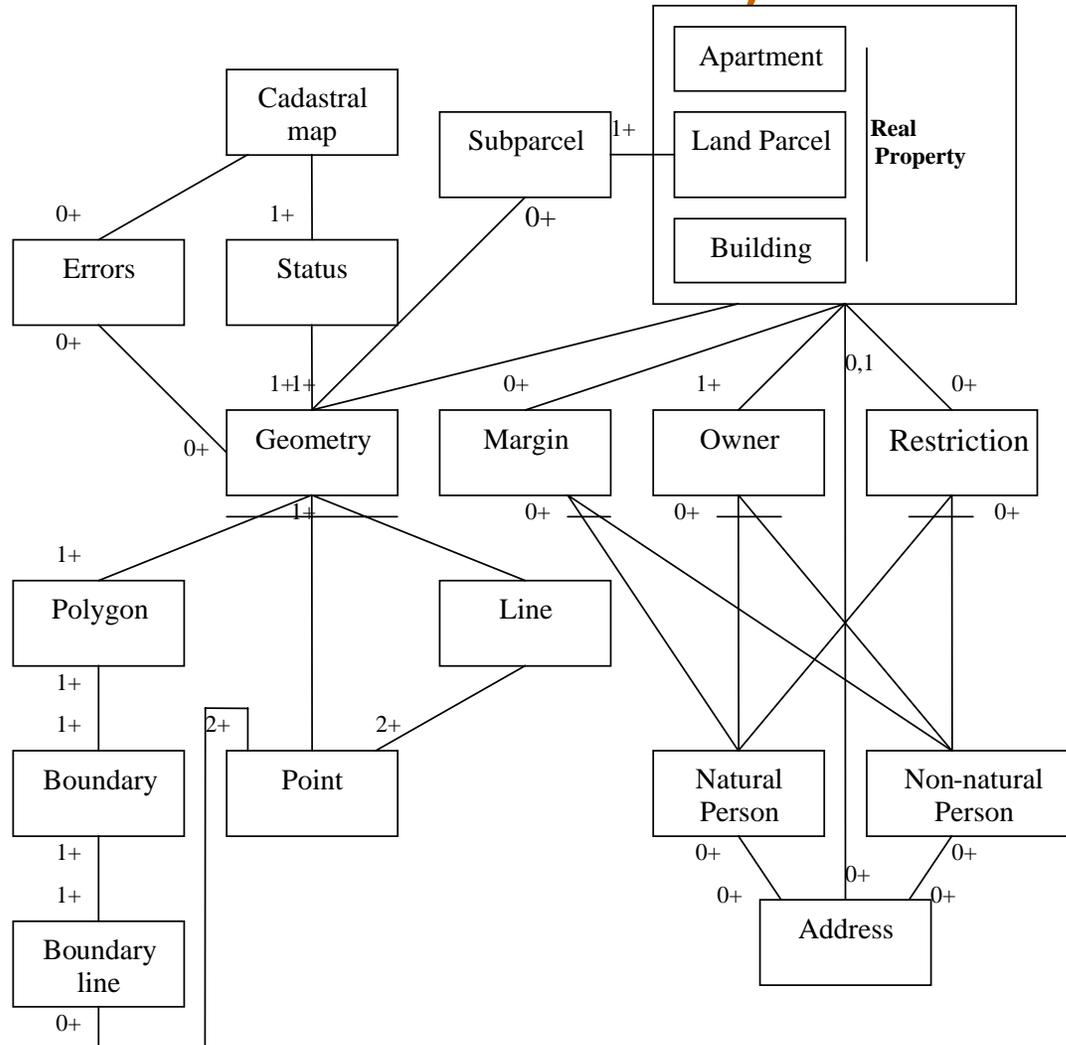
- Top Menu:** Térkép, Váltás vezetés, Adatszolgáltatás, Eszközök, Beállítások, Adminisztráció, Window, Help
- Térkép manager:** A table listing map layers with columns for Name (Név) and Type (Típus). A context menu is open over the 'Gyálárét' layer, showing options: File megnyitás..., Bezárás, Mentés, Mindet ment, and Megnyitás új ablakban. Buttons for 'Bezárás' and 'Frissít' are at the bottom.
- Nagyfőmegyei betöltés:** A dropdown menu set to 'Ellenőrzése vár'. Below is a table:

Térkép	Ügy	Státusz
Gyálárét	9/2003	Ellenőzés előtt
- Gyálárét (mértarány: 57434):** A detailed map view of a residential area with numerous numbered plots. A blue rectangular area is highlighted on the map.
- Objektum navigátor:** A tree view of data layers with checkboxes:
 - [A] Geodéziai pontok
 - [B] Határok
 - [BA] Közigazgatási egységek
 - [BB] Közigazgatási alegységek
 - [BC] Földrésztetek I. (közterületi)
 - [BC01] Belterületi közterület földrésztet (BC03-BI)
 - [BC02] Külsőterületi közterület földrésztet (BC03-BI)
 - [BC03] Külön kiemelve: Közút földrésztet
 - [BC04] Vasút földrésztet
 - [BC05] Dűlő földrésztet
 - [BC06] Közmű földrésztet
 - [BC07] Közös vízellátás földrésztet
 - [BC08] Temető földrésztet
 - [BD] Földrésztetek II. (nem közterületi)
 - [BE] Alérszettek és művelési ágak
 - [BF] Termőföld-minőségi osztályok
 - [BG] Egyéb önálló ingatlanok (EÖI)
 - [C] Épületek, kerítések és terepárgyak
 - [D] Közlekedési létesítmények
 - [E] Tervezések, függőábrák
 - [F] Vizek és vízügyi létesítmények
 - [G] Domborzat

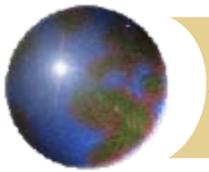
- Status Bar:** (96242.647, 732219.408)
- Bottom Buttons:** Bezár, Alkalmaz, Mentés, >>



Core data model of DATR

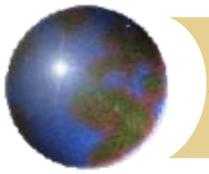


The core data model of DATR is conformed with the Cadastral Domain Model defined by our Dutch Colleagues



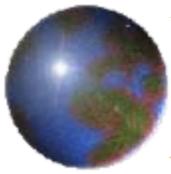
Land Information Services

- 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)

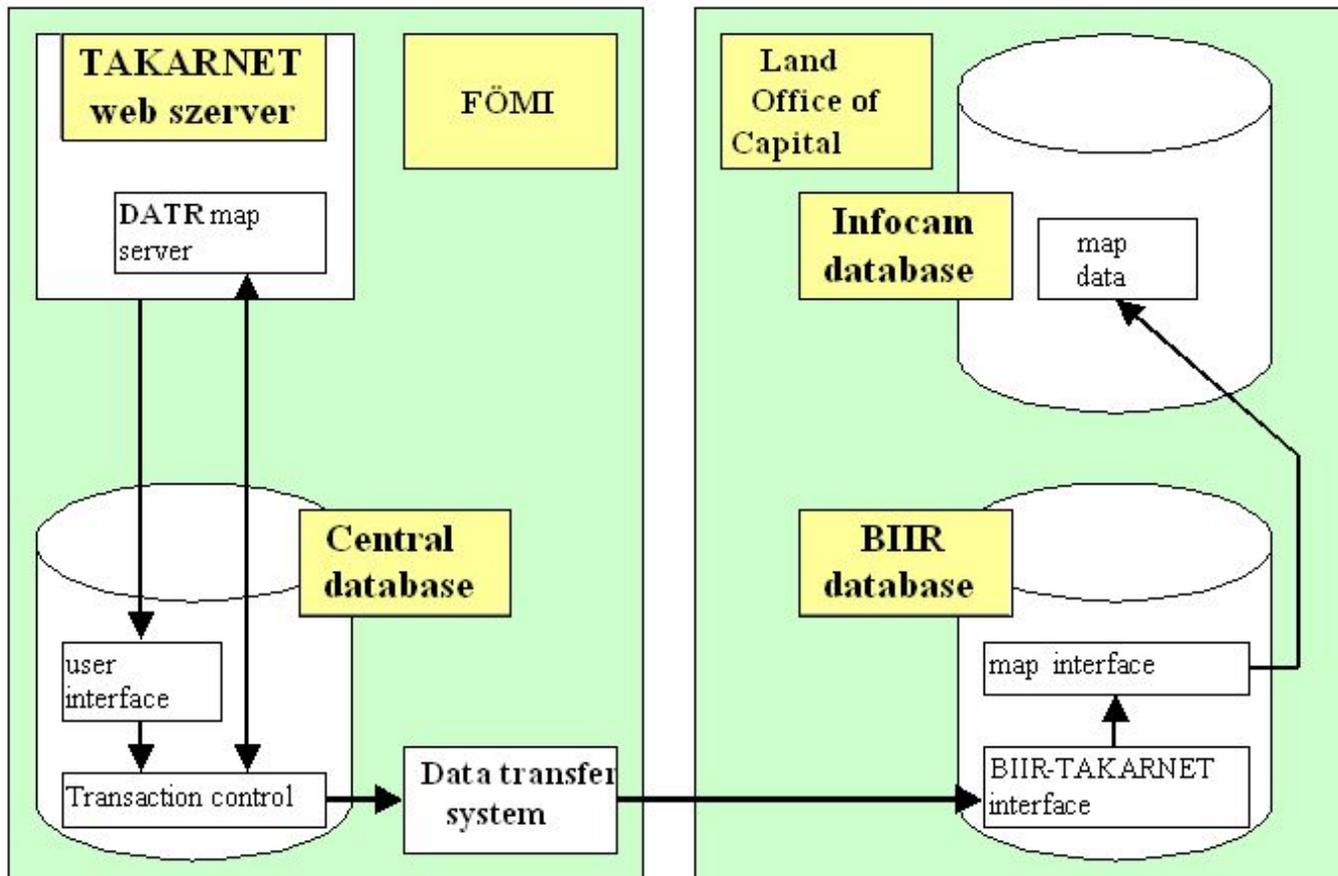


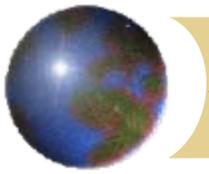
Integrated services

- 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

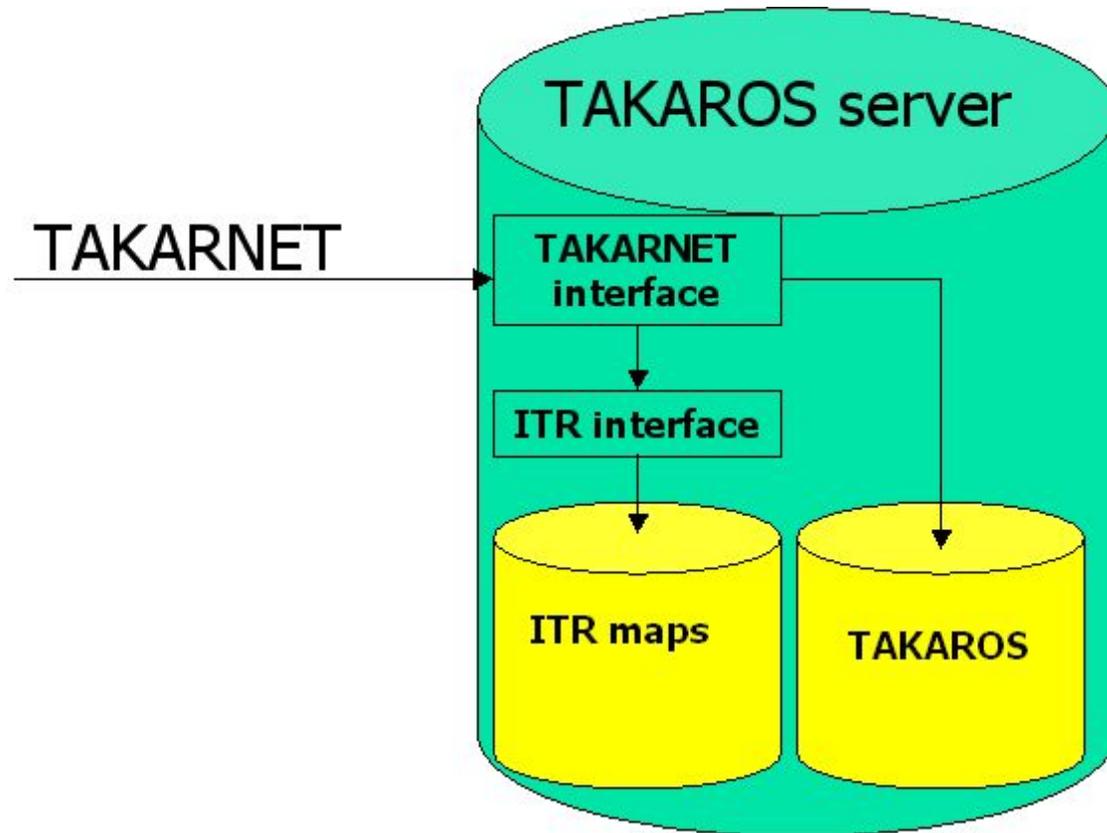


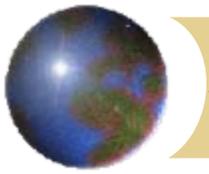
Architecture of INFOCAM service





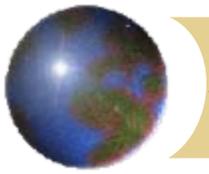
Architecture of KÜVET service





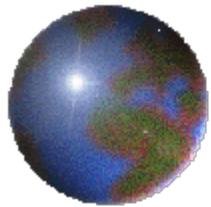
Conclusions I.

- 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 challenges 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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