BIIR - Cadastral Information System for Budapest Land Office

Zsolt Faragó

Ministry of Agriculture and Regional Development
H-1055 Budapest Kossuth tér 11. Hungary
E-mail: fm@takarnet.hu

Abstract. One of the most significant milestones of the Hungarian land management was the development of BIIR (Budapesti Ingatlan-nyilvántartási Információs Rndszer) system, which is working in the largest land office in the country. The aim of the development was to change the paper based registration to modern information technology based land registration. The system consists of two main parts. One is the Land Registration, the other is the Cadastral Mapping System. Each part has a separate database, although from the first time the developers planned about the connection of the two systems. The harmonisation - the connection and coordinated managing of the two databases - will be realised in the third project. Implementation is in progress in these months (Oct. 1999). Loading of the land registration and mapping data into the databases has lasted for several years. The loading percentage at land registration is 100%, and 30% at mapping data. The PHARE and Swiss aid supported system has demonstrated its efficiency and effectiveness in the last two years.

1. Introduction

The Hungarian Land Registry is a „multipurpose" land registration system under the jurisdiction of the Ministry of Agriculture and Regional Development. The Department of Lands and Mapping is currently undertaking a multi-phased computerisation of the land registration activities throughout Hungary. The volume and complexity of the land registration activities in the Capital, Budapest, are such that they are being computerised separately from new generation of systems the Country.

Hungary covers an area of 93,000km^2, has a population of 10 million and the property information today references 7,3 million parcels and approximately 2,5 million flats. Budapest covers an area of 525 km^2 with a population of approximately 2 million. The city is divided into 23 districts for administrative purposes, these contain approximately 240,000 parcels and 700,000 flats.

A basic element of the transfer from a command driven to a free market economy was free movement of land and property ownership. This reform started in 1990 and is currently in progress. A privatization process has ensured that a considerable part of the State owned property was transferred to local governments, associations, co-operative members and private purchasers. With this increased ownership of land and property comes an increase in the demand for land registration and cadastral information, together with the need to reduce the time taken to complete these transactions.

2. The Hungarian Land Registration System

The Hungarian Land Registry provides an official right to property and to ownership, guaranteed by the State: the information registered defines the legal status of the property. The Land Registry information and the cadastral mapping form the fundamental basis for present and future activities within Hungary.

The Hungarian Land Registry was formed by the union of the Land Tax Cadastre which described the site, area, land use, value and land classification, and the Property Rights Registry which contains ownership information. The common base of both systems was the cadastral mapping system used to define the legal boundaries of land and taxable area.

The two parallel methods of land registration were developed in the mid 19th century. In 1972 the merger of the land registry with the land tax cadastre and cadastral mapping constituted a major reform. Between 1973 and 1981 the new uniform registration system was completed for the entire country.

The present system consist of two components:
- real property registration cadastral maps, identical with land survey maps, used to define legal boundaries and for land measurement purposes
- ownership information consisting of three property sheets:
  Property Sheet No. 1: Descriptive data of land (site, area, branches of cultivation, soil cultivation),
  Property Sheet No. 2: Ownership data (name, birth, address),
  Property Sheet No. 3: All other legal data (liens, usufruct, limitations of disposals).

In Hungary the Land Registry organisation comprises 19 County Land Offices, over 114 District Land Offices. In Budapest the situation is slightly different from that in the country. In Budapest all 23 Districts of the City are combined into a single Land Registration Office - the Budapest Land Office.

The activities and responsibilities of the Budapest Land Office include:
- updating the archive of cadastral maps and associated documentation,
- maintenance and updating survey data,
- maintenance and updating of ownership documentation,
- communication with local users,
- production of new property sheets,
- copying property sheets
- undertaking small survey works.

3. Budapest Land Office from 1990

Parallal with the privatization process property ownership has increased. Real estate activities of the private-owned flats started immediately, causing more works to the Budapest Land Office.

 The following statistics show the trend of land registration processing in Budapest:

- number of the registered flats grew during the past few years from 300,000 to 750,000,
- number of Registered and Unsettled Applications

Year	Received and Registered Applications	Unsettled Applications
1990	160,100	40,000
1991	219,200	63,000
1992	233,700	129,000
1993	281,000	238,000
1994	252,000	368,000

- the Budapest Land Office provide the general public with an extensive property sheet copying service. In 1990, a total of 100,000 property sheet copies were   provided while in 1996 a total of 220,000.

These were the key problems. Priority has been given to the processing and management of Legal and Administration / Land Registration information (more then 200,000 transaction annually) rather than to Cadastral Mapping information (2,000 transactions annually).

There was insufficient human resources to simultaneously process the applications, coping with the property sheets and provide an information desk to the general public. These problems made it evident that activities of Budapest Land Office with a traditional paper-based registration process is impossible.

4. Development of Cadastral Information System

To solve the problems mentioned above the BIIR system was developed. The system consists of two main parts: the Land Registration System and the Mapping System.

4.1 The Land Registration System

The Land Registration System was designed to support all activities associated with the management of the Legal and Administration information within the Budapest Land Office. This primarily involves the management and maintenance of „property sheets" that define the legal ownership and rights of land and property within Budapest.

The system consists of the following parts:
- Application Registration Sub-System
- Property Sheet Management Sub-System
- Customer Correspondence Sub-System

The database of system consist of data of three Property Sheets.

4.1.1 Application Registration Sub-System

The Application Registration Sub-System supports the registration of Applications received by the Budapest Land Office and controls their subsequent processing. As applications are received by the Budapest Land Office by post or through the public desk there is a requirement for each of the applications to be initially logged on acceptance and their processing status logged and monitored as they are subsequently processed. Legally, all applications must be processed strictly in chronological order of receipt. Therefore, there is a direct link between this sub-system and the Property Sheet Management Sub-System.

The Application Registration Sub-System is primarily an operational tool to support the processing of applications, but is also to support:
- the information requests at the „Public Enquiry Desk" related to submitted applications; and
- a Management Information System providing statistics on the backlog (unsettled applications) situation and application processing throughputs. This is to support the optional allocation of staff and computing resources.

4.1.2 Property Sheet Management Sub-System

The Property Sheet Management Sub-System involves the management of the Legal and Administrative land registration information currently maintained just like on paper based property sheets. This is central to the support of operations within the Budapest Land Office. Each land parcel or property has a maximum of three associated property sheets describing different aspects of the land parcel or property.

There are three types of transactions within the cadastral and land registration process:

- Those requiring changes to the cadastral maps only;
- Those requiring change to the property sheets only;
- Those requiring changes to both the property sheets and the cadastral maps.

There is a wide variety of different types of transactions that affect the content of the property sheets, with each transaction type affecting different parts and entries in the corresponding property sheets. The Property Sheet Management Sub-System supports the last two types of transactions described above, the first manages the mapping system.

This sub-system supports the following activities:
- The maintenance of the Property Sheet Database through processing of the applications. This includes the management of the flowline to support monitoring of application processing;
- The archiving of historical entries of the Property Sheet Database;
- An information service providing operational and a Public Information Service through querying and reporting facilities;
- High volume of requests for official copies of the property sheets.

One of the most significant activities of Budapest Land Office is providing official copies of Property Sheets through Public Enquiry Desk. In order to make this activity faster and to enable the paper based Property Sheets archiving as well, more then 3 million size A4 Property Sheets were scanned. Providing of Property Sheets were from the scanned sheets or from the loaded Property Sheet Database.

4.1.3 Customer Correspondence Sub-System

The customer Correspondence Sub-System supports the tasks undertaken by the Case Officers during the process of assessing the Registration Applications. As part of these activities the Case Officers are involved in corresponding with the applicant and interested parties, for example to request information missing in the original application. This sub-system provides general word processing (MS WORD) facilities to support issuance of correspondence. As an additional aid the sub-system is wherever possible provide standard letters and pro-forma certificates for issue upon completion of the registration process.

The Case Officer is involved in corresponding with the applicant and interested parties in two scenarios during the processing of the applications:
- Incomplete Applications

    The initial steps of the processing of applications involves a completeness check to ensure that all documentary evidence has been included in the application. If any items are missing then the application is paced in a pending pile and a letter sent to the applicant requesting the missing documentation.
- Certificates

    At the end of the processing of an application the Case Officer is involved in issuing a certificate and covering letter to the applicant and all interested parties.

4.1.4 Implementation of the Land Registration System

The Land Registration System was developed within the framework of a PHARE project. The system started in January of 1997. In this time the data of two districts were loaded into the system. In May of 1997 scanning of Property Sheets was finished. The loading of all Property Sheets into database was accomplished in 1999. UNIX operation system manages the database and the clients. At this time more than 300 clients are working in the Land Office. The amount of stored information in ORACLE database are more than 24 Gbytes.

4.2 The Cadastral Mapping System

The City of Budapest is covered by cadastral mapping at a scale of 1:1000. Cadastral maps contain the parcel boundary descriptions (including road and verges), parcel numbers, buildings, geodetic control points and limited contour coverage, street names. The number of this maps are approximately 1700. The updating of the cadastral survey data happens primarily by applications for changes in parcel boundaries, buildings, other situation and land use. These processes are managed by the Budapest Land Office.

This application consist of the following elements:
- Loading of the Digital Cadastral Maps
- Loading of Geodetic Control Point Data
- Management of the Pre- and Post Registration information
- Copies or Extracts of Cadastral Maps
- Copies of Geodetic Control Points Data.

The digital mapping system supports a compatible data model allowing topological structuring of parcel features (object and supporting the sharing of boundaries between different feature) object classes. The parcel numbers contained within the digital cadastral data must be cross checked against those contained within the property sheet database to create consistency and integrity between the two system - this allows their subsequent integration.

4.2.1 Data Capture and Loading

The majority of the Budapest districts cadastral maps was based on accurate field surveys carried out from 1930. So every boundary break points had coordinates. Only the buildings and other text was gathered by digitising from the maps. During the loading procedure the object oriented database was created. The system supports the cleaning and restructuring of the data during the loading procedure. This resolve the map boundary problems to great continuous geography. The data of the two pilot districts had to be converted and updated in 1998. In 1999 already six districts are on the database.

4.2.2 Management of the Pre- and Post Registration information

The Pre-Registration is in situation where Registration of Applications involve modifications to parcel boundaries, for example parcel subdivision or aggregation, the applicant must firstly preregister the result of the associated field survey with the survey section of the Budapest Land Office. The survey section checks the survey and provisionally records the results on the Cadastral Map (In the paper based system, the provisional change was recorded in pencil to differentiate them from permanent, approved changes).

In Post Registration the survey section receives notification from the Land Section that a registration of Application involving modifications to the parcel boundaries has been fully processed, for example Land Certificate issued, the Survey Section must change the status of the corresponding parcel definitions within the Cadastral Management System.

4.2.3 Copies/Extracts of Cadastral Maps

The Budapest Land Office provides a service to produce extracts from the cadastral maps directly to applicants or their appointed agents and for use within the Budapest Land Office. This part of the system is the simple production of extract copies of part (or parts) of the cadastral map.

These extracts are used for three principle purposes:
- Acquisition of information about a specific parcel(s) prior to surveying by a licenced surveyor (copy to paper or floppy); or
- Information gathering by Banks or Real Estate Companies; or
- Use within the Budapest Land Office.

4.2.4 Implementation of Cadastral Mapping System

Tha Cadastral Mapping System was developed within the framework of Swiss financial assistance. The project started in summer of 1996 and had three phases: the analysis of the requirements, the implementation and operation of a pilot system for two districts. These three phases were accompanied by supporting activities like training, technical assistance and know-how transfer program. The Mapping System consists of a server with SOLARIS UNIX operation system, and the Leica INFOCAM GIS/LIS software. The data of maps are on ORACLE database. The surveyors work on four SUN workstations which have plotter and printers.

5. The harmonisation

The Land Registration and the Cadastral Mapping System have a separate databases. One has alfanumeric data, the other has spatial data. The harmonisation - the connection and coordinated managing of the two databases - will be realised in PHARE project too. Implementation is in these months. This application will bring together the Land Registration and Cadastral Mapping System and integrate them to produce a conceptual, single system.

The advantages of integrating the system are the following:
- The Land Registration will be able to be accessed from the Cadastral Management System and vice versa.
- The consistency and integrity between the two systems will be automatically maintained.
- The flowline management of application processing will integrate all legal, administration and cadastral activities.

This approach will result in savings in staff time and greater flexibility. This integration will also enable some of the downstream sub-system to be introduced more efficiently, in particular the provision of online services to external organisations.