Evolution towards the Digital Land Office

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Keywords: digital land administration, digital cadastre, web data service

SUMMARY

From national economic point of view, the uniform land registration system operating in Hungary is one of the most important databases of the country. This system has been keeping and maintaining all descriptive (legal) and geometric data, also information on ownership and other rights (e.g. mortgage), land use and land protection relating to all landed properties and other real estates in Hungary in an authorized way and continuously updated status. The cadastral maps integrated into the uniform land registration system show spatial relations and references of rights, facts and other information appearing on the property sheets, serving as a basis of engineering planning for the national economy. The national spatial data infrastructure can be built on this uniform, authorized and public land registration system, in small partial modules, following the EU INSPIRE Directive.

The latest development idea is to organize the data into one database (data warehouse) synchronized with the central land office database, and in another one, which serves for the data market and data mining. Consequently, data maintenance and data supply will be separated. This way, through organized centralisation of data, a „round-the-clock" land office information service can be realized, which will strengthen the data security in Hungary. This will be accessible for citizens through the Central Clients' Gate on the Governmental Portal. In the first phase of the long-term "Digital Land Office" development plan, the central system will only supply data, but it is also the basis of the future electronic case management procedure supported by countrywide uniform forms.

ZUSAMMENFASSUNG

Auf dem Weg zum digitalen Kadasteramt

Aus wirtschaftlicher Sicht ist das einheitliche System des Liegenschaftskatasters (der Landregistrierung) eine der wichtigsten Datenbank Ungarns, die alle geometrischen und beschreibenden (gesetzlichen) Informationen über die Eigentumsverhältnisse, sowie andere Verpflichtungen (z.B. Hypotheken) enthält. Darüber hinaus werden auch Informationen über Landnutzung, Landschutz, und Liegenschaften in ganz Ungarn amtlich dokumentiert, verwaltet und ständig fortgeführt. Die in das einheitliche System der Landregistrierung integrierten Katasterkarten zeigen Lagebeziehungen und verweisen auf rechtliche und andere Informationen. Diese Karten mit den dargestellten Eigentumsverhältnisse dienen als Grundlage für wirtschaftliche Planungen in ganz Ungarn. Eine ungarische Geodateninfrastruktur kann auf diesem amtlichen und öffentlichen einheitlichen System der

Landregistrierung aufbauen, das teilweise bereits den Festlegungen der EU-Initiative INSPIRE entspricht.

Eine neuste Entwicklung ist, die Daten in einer speziellen Datenbank (Data Warehouse) zu verwalten, die einerseits kontinuierlich mit dem einheitlichen System der Landregistrierung synchronisiert wird und andererseits dem Datenangebot und zur Suche von Daten dient, wobei Datenhaltung und Datenversorgung strikt getrennt werden. Diese organisatorische Zentralisierung kann als ein 24/7 Katasterinformationsdienst angesehen werden und ist ein Beitrag, die Datensicherheit in Ungarn zu stärken. Der Zugang für die Bürger erfolgt über ein Zentrales Regierungsportal. In der ersten Phase dieses langangelegten Projektes des Digitalen Katasteramts werden nur Grunddaten zur Verfügung gestellt, die aber die Basis für zukünftige, landesweit einheitliche Verwaltungsverfahren bilden.

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1. INTRODUCTION

To establish a well-functioning legal background and institutional system of land administration (including land registration) that satisfy the user demands is a major interest of any country – developed or being in transition – as the guarantee of safe and secure land and property ownership rights is one of the most important preconditions of a sound market economy.

Among Central-European countries, Hungary is the one where the land registration system has continuously been working, due to the uniform land registration system created in the 1970s. By the period of transition to market economy (1990s), all landed properties and other real estates have been registered, and the large-scale cadastral map covering the whole area of Hungary was available. These circumstances helped a lot when the privatisation of land and other real estates started that has quickly and successfully been performed, compared to the neighbouring countries in transition.

Having an official land registration system in place, an excellent tool is provided for the government to supervise, control and influence land and property market, land consolidation, land use and protection. The cadastral maps integrated into one uniform land registration system show spatial relations and references of rights, facts and other information appearing on the property sheets, serving as a basis of engineering planning for the national economy. The national spatial data infrastructure can be built on this uniform, authorized and public land registration system, in small partial modules, following the EU INSPIRE Directive.

The land registration sector is a key element of a free market economy whereby the safe and secure transfer of title can freely be conveyed. In Hungary, like in many other European countries, the government acts as the guarantor of title through the act of registration of property, which records all required legal, administrative, financial and physical description within the system of the register (property sheets) and upon the cadastral map.

The mission for the entire land administration: „To become an efficiently operating and successful institution, which guarantees geo-referenced real property related rights for facilitating secure property transactions, and providing an infrastructure and services for economic, environmental and social purposes."

With the aim of reaching these goals, the land administration elaborated a long-term development programme called "Digital Land Office". The chance to complete this programme was created when the financial resources provided for the coming years by Hungary and the EU were opened.

2. CURRENT STATUS OF THE UNIFORM LAND REGISTRATION

2.1 Management Features of the Hungarian Land Administration System

The Hungarian Uniform Land Registration System, the integration of legal registry and cadastre, as a multipurpose system fulfils all the requirements supporting the Hungarian economy. Since 1972, the Ministry of Agriculture and Regional Development, Department of Land Administration and Geoinformation (MARD DLAG) has been responsible – through its two-level network of land offices – for the uniform land registration and the updating of large scale cadastral maps. The property sheets and cadastral maps actually are maintained in 118 District Land Offices (DLO); the principal activities of the 19 County Land Offices (CLO) and the separate Budapest Capital Land Office (Bp CLO) are supervisory. This institutional system is responsible for geodesy, land registration, surveying, mapping and remote sensing, and executing the land tenure policy of the government (e.g. land protection, land privatisation, land consolidation and land use monitoring).

Cadastre serves as skeleton for the NSDI, and majority of the core SDI data (according to the EU INSPIRE Directive) and related services have to be provided by the institutional network of the land administration. Its direct professional supervisory authority is MARD DLAG.
The Institute of Geodesy, Cartography and Remote Sensing (FÖMI) is the central surveying and mapping organisation of all official activities in Hungary in the field of land management, surveying and mapping. Other pillar of the Land Administration is the network of the county and district level Land Offices.

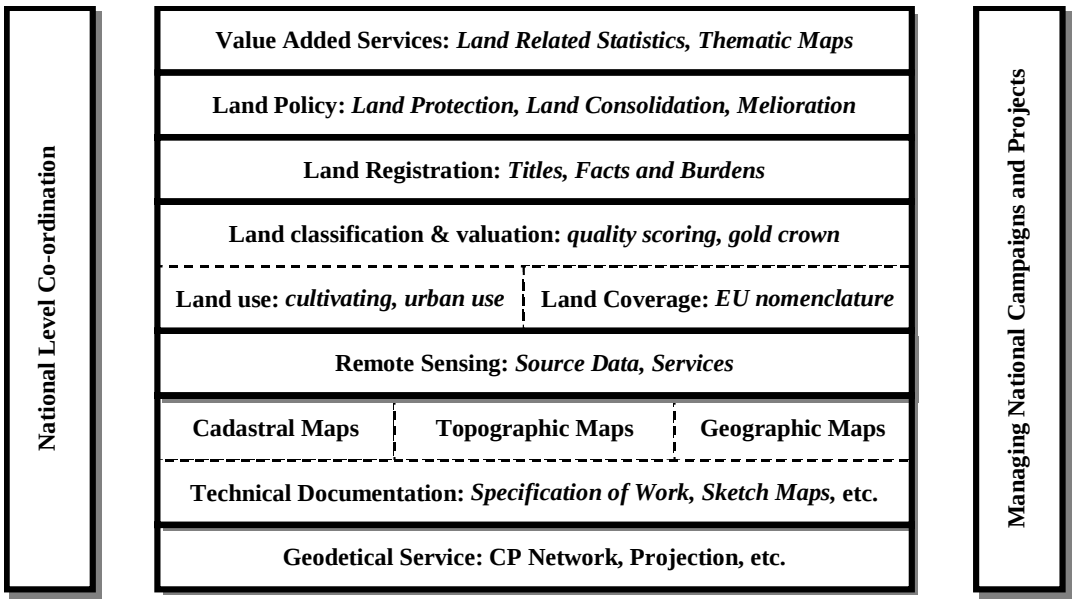

Figure 2-1: Overview of the land office services

2.2 Results of the Modernisation Programme

The comprehensive modernisation of the land registration sector is a long process. Following an agreement signed in December 1990 between EU and the Hungarian government, the EU PHARE supported programme called "The computerisation of land offices" has started to establish the infrastructure background for this complex process. Besides the technological development, the legal, operational, marketing and other related problems are also investigated within the modernisation programme.

During the past one and a half decade, important formal changes took place in the land registration system. Co-financed by the EU Phare Aid Programme, the countrywide computerisation of land offices has been realised. Since then, property sheets have been maintained and applications managed on computer all over the country. The intranet-like network of the land offices (TAKARNET) was also built up. This network is connecting all official players of the land management sector, providing online access to the continuously updated land registration data. Recently, the land offices are also being connected to the Main Electronic Governmental Network.

Figure 2-2: The network architecture

In the meantime, within the National Cadastre Program, in several phases, digital maps covering the whole area of Hungary have been completed (by end 2005 total rural area, by end 2007, total urban area also available in vectorised form, plus the special peri-urban areas called "hobby gardens"). From the start of the compensation period, updating with changes on

the maps was carried out partly manually, partly on computer; in the past couple of years it goes completely computerised.

In the past 15 years, the land management sector has been developing the land registration office network in line with the TAKAROS concept. Its improvement and enlargement on higher level can be realised in the framework of e-government and e-administration.

Since April 2003, online access to TAKARNET network has been provided also for external users (registered and authorized) through Internet. Depending on their registered rights, they can have access to all registration data of Hungary's lands and other properties. Due to the improvement of the online case management through TAKARNET, the Hungarian land registration data supply/service managed to reach third level of e-governmental service in a qualification system defined by the EU. It means a service providing interaction from both sides.

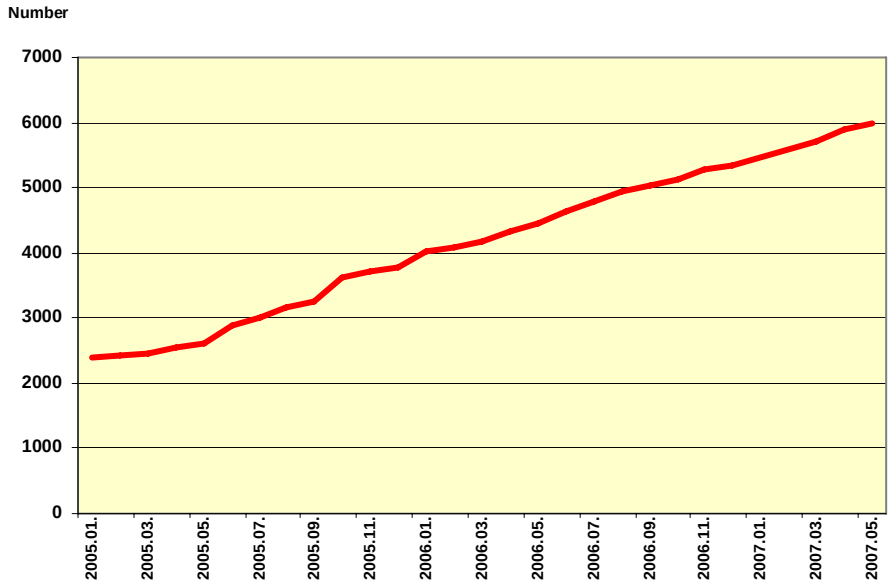

Figure 2-3: Number of TAKARNET users (certificates)

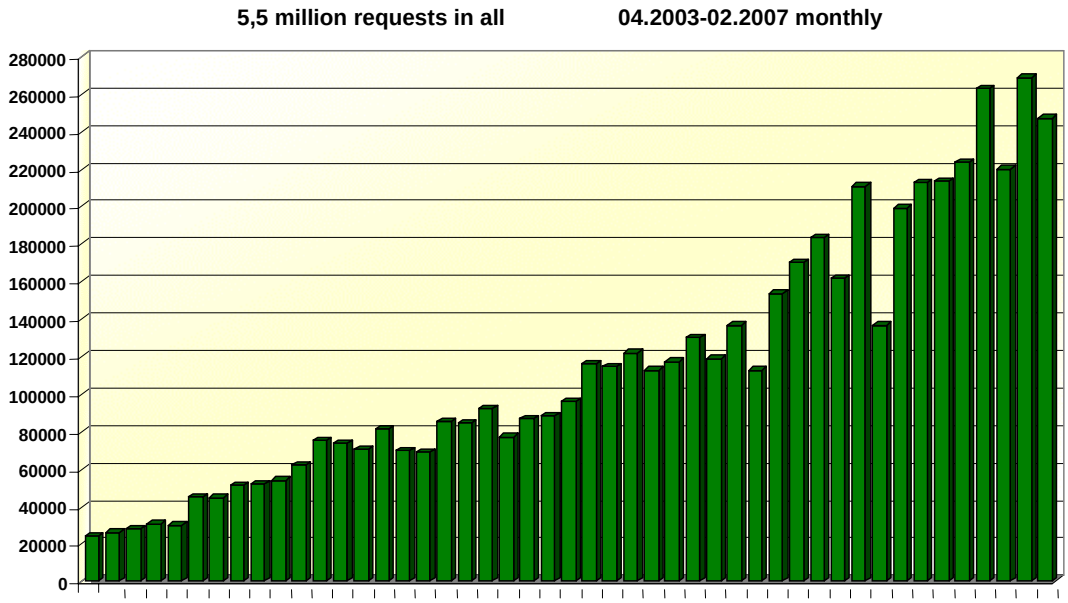

Figure 2-4: Number of TAKARNET property sheet copies requested

A linear trend can be observed in the growth of users' number since the start of TAKARNET service. Worth mentioning that nowadays private individuals cannot join the network; this opportunity is offered mostly for users requiring bulk data (notaries, banks, attorneys at law, lawyers, local governments etc.). For certain official users (courts, bailiffs etc.) it is obligatory to use this network only. By now, there are more than 7000 registered users of the TAKARNET system.

The dynamics of these factual data and the ever growing strong need for this kind of service give basis for the expectations that by further widening of the services, the improvement would be not only a necessary and useful investment for the benefit of the whole society, but a financially viable venture too.

Because of the latest development in the land management sector, copies of digital maps are also at users' disposal through TAKARNET. First, the cadastral maps officially accepted by the Capital Land Office of its area of competency, and later, since 2006, the digital maps of rural areas, and recently also urban areas became accessible.

From the above summary, it can be seen that the Hungarian uniform land registration system as vital part of the national basic data structure reached such a level of service that has a promising future.

However, without improving electronic network services and renewing the technological background, it cannot provide a solid authorized basis anymore that would directly or indirectly guarantee the fulfilment of the aims of the Hungarian development policy.

3. THE LONG-TERM DIGITAL LAND OFFICE PROGRAMME

3.1 The Main Elements of the Programme

The development plan has a dual strategic aim:

- On the one hand: increasing the efficiency of land registration, providing a more client-oriented case management, improving the quality of services through further development of the electronic land registration;
- On the other hand: elaboration of controlled basis for the National Spatial Data Infrastructure (NSDI) and methods of its use also for other purposes through the establishment of the digital land office.

When realizing the NSDI, the directives of the EU Commission for Cadastre should be considered, with special attention to this statement: ”In the individual member countries, the authorities that are responsible for cadastre should emphasise the ever growing use of cadastral information, and avoid to create new databases with local aims, independently from cadastral organizations. They should co-operate in a way, which allows the use of local information in line with the application of the EU policy.”

To fulfil our mentioned strategic aims – increasing the efficiency of land registration and elaboration of controlled basis for NSDI – further goals are necessary to reach:

- Raising the level of land administration services, extension of electronically available services and providing wide accessibility to them,
- Rationalizing the resources needed for operation.

Depending on the available financial and other resources and considering the expectations of the society, the duration of the long-term development plan ”Digital Land Office” was planned to be 5-8 years. The plan consists of the following elements:

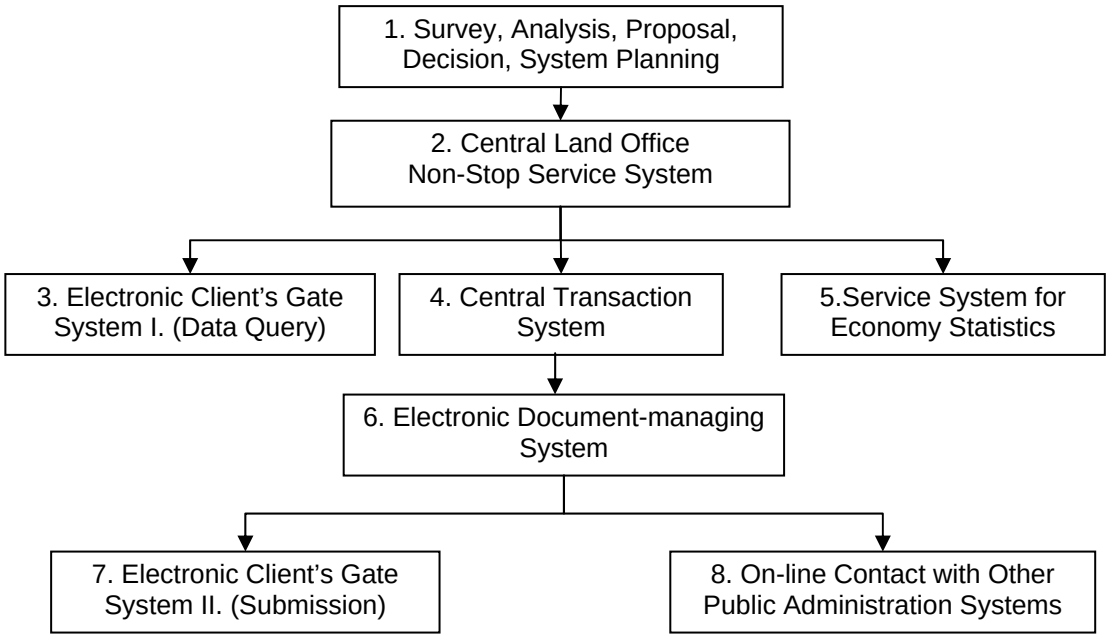

Figure 3-1: Main elements of the long-term development plan "Digital Land Office"

1. Surveying opportunities and tools, considering the aims. Elaboration of uniform system plans for all projects.
2. Leaving the existing server structure (119 serve centres) unchanged, building out the Service System of the Central Land Office as the only land registration data supplier for clients that applies only the existing methods (land office client service and TAKARNET).
3. Creating the interface in the Service System of the Central Land Office for data query about property sheets and cadastral maps by identified clients entering through the Client's Gate of the Governmental Portal.
4. Completing the services with data-mining tools.
5. Replacing the 119 server centres with the Central Transaction System that can be operated safer and more cost-effective.
6. Through electronic managing the arriving and outgoing documents/applications, the case management becomes quicker and location-independent.
7. Submission of applications becomes also location-independent.
8. The electronic interchange of documents between offices, the exchange of digital data and also data control provides a more economic and more efficient public administration.

As a result of the step-by-step development, we will reach the modernisation of the whole procedure of land office case management until a completely electronic case management and servicing. The land offices can offer and extended electronic service, the level of servicing and data quality will improve, there will be opportunity to data checks based on the data of other public administration databases; all these will strengthen the legal security provided by land registration. Direct result of the present project will be that wide circles of users can have access to land registration data on the internet, through the Client's Gate of the Governmental

Portal. Further on, there will be opportunity to supply data collected for different purposes from any part of the country, and there will be no need to use paper in more and more phases of the case management procedure. This development would allow applying multilingual user interfaces and data content that helps free information flow within the EU.

From technological point of view it means that finishing this long term and multi-phase development, one and only high-secure central database system will take over the duties of the local databases supporting land registration and land surveying activities and operated nowadays in about 140 institutions (district and county level land offices in the country and in Budapest). The land office systems operating at present in client-server architecture will be replaced by a three-layer architecture: data storage happens in the central database, then application logics runs in the application servers in the centre, ”thick” workstations of the land offices will be replaced by ”thin clients”. The land office clients join the centre through data transfer network.

3.2 Central Land Office Non-Stop Service System

The operability and development perspectives of the present information systems prove that the developments completed by now were elaborated in accordance with the principles of e-government. However, together with the significant improvement, also insufficiencies appear that can heavily damage the quality of service. At present, it is a severe problem of the land office data supply through internet that the data– due to reasons of operation, safety and fire protection – are only available during the main eight-hour work time.

The land registration databases are currently decentralized, i.e. the land registration databases are kept – in accordance with the principle of territorial competency – in the district land offices keeping the records up-to-date, and those databases are separated physically from one another too.

On the intranet-like TAKARNET connecting 119 district land offices of the land management and geoinformation sector – because of operational and security reasons – the external registered clients can have access to land registration data during eight work hours only. In the first phase of the development it is planned to organize the data into a database (data warehouse) synchronized with the central land office database, and another one, which serves the data market and data mining. Consequently, data maintenance and data supply will be separated. One group of servers, the land office transaction servers will perform the functions of the usual closed system of application registration and processing, while the other one, the server for enquiries open to the world will provide services and data supply. This way, through organized centralisation of data, a „round-the-clock” land office information service can be realized, which will strengthen the data security in Hungary. This will be accessible for clients through the Central Clients’ Gate. In the first phase of this long-term development plan, the central system will only supply data. The updating – according to rules of law – will happen in line with the principle of territorial competence, in other words, in the databases of the district land offices, as usual.

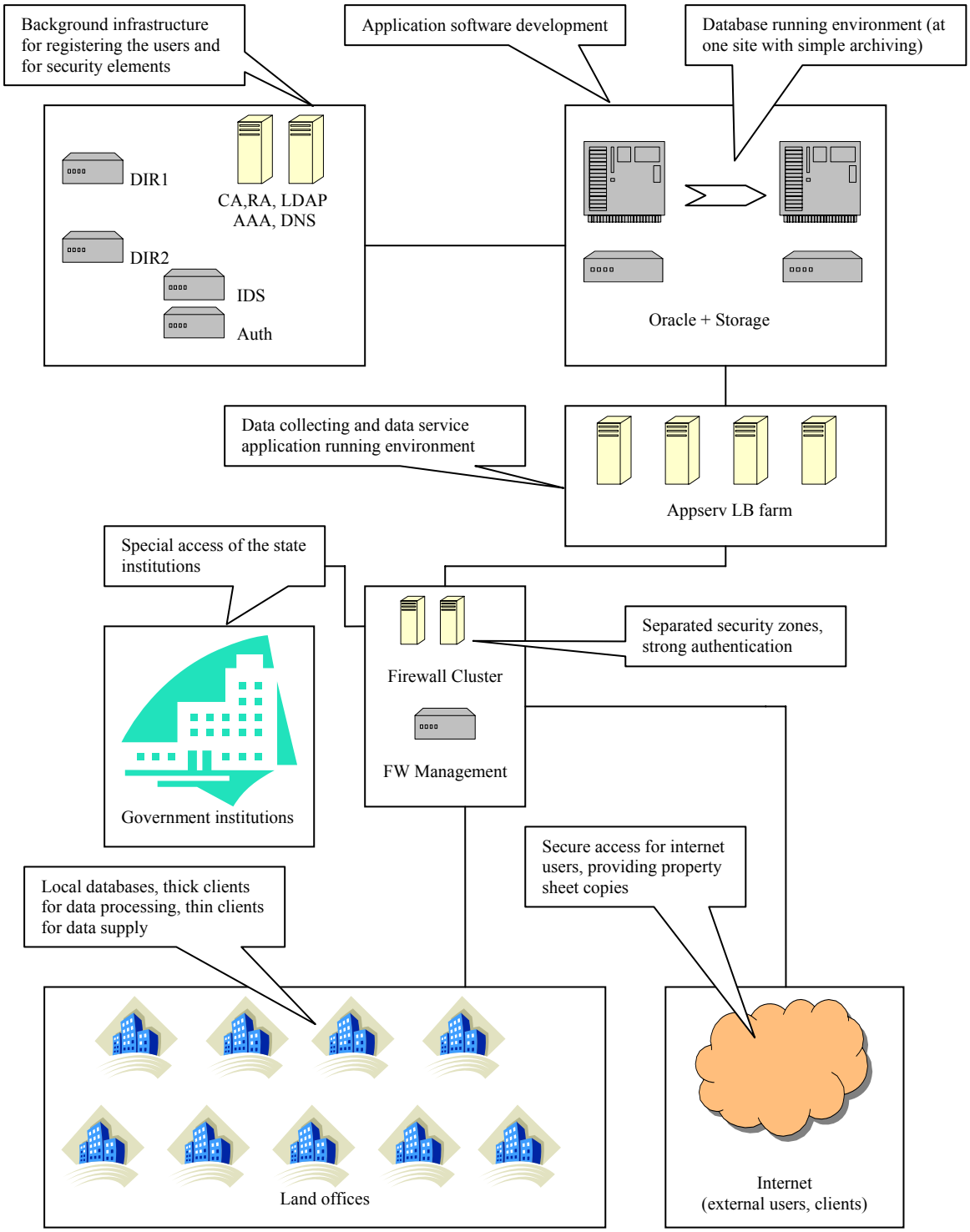

Figure 3-2: Decentralized data processing, centralized data management and supply

Through this development, in the resulting new infrastructure, accidental data extensions can quickly be solved, e. g. by marking the value of the land and property, the duties concerning obligatory data supply for public administration purposes (property tax) can also be simply performed. A system like that would be able to offer marketable value-added services and products too.

When modifying the services and enlarging the applications in content, space and time, the land management sector could more efficiently cope with the demand and supply relations in the market.

- **Improving the value-added services**
  The territorial dismemberment and the incalculable operation time: these are the two major technical obstacles of creating value-added services. In the case of jobs that involve the territorial competence of several land offices – e.g. construction of motorway, flood protection investments – the necessary analyses and data acquisition are only possible through repeated data processing of poor efficiency, the completion deadline of which cannot be foreseen. On the side of local administration offices, other organisations and companies, an ever-growing need appears for data acquisition according to several criteria and in line with the relevant rules of law.
- **Extending the services**
  Income can grow by introducing new services. Apart from the querying of the up-to-date property sheet, in the framework of future developments, a countrywide map-form land searching service will be elaborated. Following the first simple, linear solution, the next version can be completed by aerial and satellite images further on. Applying the map-form land searching function, one can find the location of a certain landed or other property, or in the case of need, it provides access to land registration data too.
- **Enlarging the circle of authenticated users**
  At present, digital land office services can be used by registered and contracted users; the number of potential users is significantly limited, and citizens are excluded from the service anyhow. In the current structure of the land office IT system, the number of clients cannot grow, but after the completion of the first phase of the central system, it can be scalable almost at will. Having a central query system, also a multilingual query system can be realised. A further advantage is that later on, the system in the new form can easily be connected to the e-government network.
- **Influencing the needs**
  The players of the economy are using (or not using) the services of a registration system according to their own interests. Those groups, who need the land offices registration data and services for their jobs, but their working hours do not coincide with that of the land offices – e. g. attorneys at law or the wide circle of foreign investors – can use the system in a limited way only, in spite of their wish. It is also inconvenient when the user is missing the necessary official information he/she wanted to have in due time. All these problems would fall out, if a central database of continuous operation started to work.

The realisation of this first phase of development is the first step towards a modern countrywide hardware system of high technical level for the land registration network. Out of

the three elements of land office work procedures – application registration, case management and data supply/service – data supply/service can be performed on the central computer. In this way, land office data queries arrive at the central query server only. A system modified like this will increase the data security, the efficiency of the services and cut the length of reply time. In this advanced system, the land offices will be able to supply all necessary information for planning, compile periodical systematic statistics, perform ad hoc special queries for analysis etc. in a more efficient way, involving less resources and will be more reliable.

The central core database is also the basis of the future electronic case management procedure supported by countrywide uniform forms. The external logical relation built up in a centrally organized, central query system – when applying suitable data federation technologies – provides more efficient service with other, government-level databases (e.g. central address register) than in the case of individual relations of a decentralised system. Following the principle of interoperability and SOA methodology, a modern public administration data supply can be realized from databases keeping various national geodata. Therefore, the case management of public administration can be quicker and more efficient; with a further step closer to the „servicing State". That's why the institutional network of land offices has been participating in several pilot projects. Only recently, a new co-operation started for the realisation of the „one stop shop" method in the case management at the local governments.

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