

Report of Joint Conference EuroGeographics-CLRKEN, PCC, EULIS

THE ROLE OF THE CADASTRE AND LAND REGISTRATION IN THE INTERACTION WITH ITS PARTNERS

Bratislava, 17-18 November 2016

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Edited by

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Introduction

EuroGeographics-CLRKEN together with its partners PCC and EULIS organized a joint workshop in Bratislava, Slovakia on 17/18 November 2016. The focus of the workshop was on the aspects of cadastre and land registration (CLR) and the interaction with its partners, such as e.g. geodata infrastructure, social issues, and future developments. The most basic role of CLR data is to document and register legal issues, such as landownership rights and restrictions. CLR data are also a crucial basis for many other land administration and management issues, and also the national geodata infrastructure. The workshop also looked at issues that may become relevant over the next few years by further developing the CLR systems and increasing the value of the data.

The workshop was structured in several sessions. The first three sessions managed by the CLRKEN focussed on the aspects of registration, geodata infrastructure and societal issues. The last session was organized and managed by the PCC:

Session 1 – Role of CLR for Registration: The most basic role of CLR is to document and register legal issues, such as landownership rights and restrictions. The first session looked at these in terms of good governance and how CLR can or should interact with partners.

Session 2 – Role of CLR in Relation to Geodata Infrastructure: CLR data are a crucial basis for many other land administration and management issues, such as land-use planning, etc., but also the national geodata infrastructure. This session looked into such aspects that became feasible only within the digital information age.

Session 3 – Role of CLR in Societal Issues: Geodata are being collected and made available to administrations, citizens and other private sector clients. But once the data are complete and available, what next. This session highlighted aspects that may become relevant over the next few years in further developing CLR systems and the value of their data.

Session of PCC – Role of Cadastre and Land Registration in the Interaction with Partners: Issues related to the Digital Single Market, integrated information systems and interaction between partners and cadastre and land registry institutions.

Session 1 – Role of CLR for Registration Purposes

Integrated Cadastre-Land Registration System and Interaction with Partners – Case Study from Moldova

Angela Matcov (Director of the state-owned enterprise “Cadastru”, Moldova)

Cadastral system in Moldova

Since 1998, the Republic of Moldova is implementing a national wide real property cadastral system, a unified system for real estate inventory, real property rights registration and market-based real property valuation for taxation purposes. The country has built a well-established institutional and legal framework for real estate registration, the State Enterprise “Cadastru” (CADASTRU), within the governmental body – Agency for Land Relations and Cadaster (ALRC), being the only entity that has the mandate to register real estates and real property rights. Moldova has been successful in the registration of real properties, having registered 85% of real estate objects (total estimated number of real estate objects is 6.0 million). Nowadays, the unified cadastral system comprises over 5,0 million registered real estate units, 4.7 million land plots are mapped in the cadastral plans, over 800,000 real estate units are valued based on CAMA methodology. The State Enterprise “Cadastru” is an independent, self-financed registration body, with 39 branch offices, located in every district of the country, financing its activity from income generated by fees. Annually, over 380,000 registration applications are processed, 790,000 documents are issued from the real estate register and over 2.2 million searches in the Central Cadastral Data base are made.

The cadastral system in Moldova is multifunctional, supporting the real estate market activities, the fiscal system, the banking system, the judicial system, as well as the local and central authority's activities.

Technological Transformation and Land registration system

In 2010, the Moldavian Government launched the Governance e-Transformation process. This strategic program sets the objectives of this process and provides a unified vision to modernize and improve the efficiency of public services through IT governance. The general objective of the Government is, by 2020 to become more transparent and responsive and perform better due to intelligent investments in IT and their massive use in the public sector. Supporting the governmental e-Transformation initiative, the State Enterprise “Cadastru” reviewed its strategic development plan and developed a new IT strategy, setting as an objective the digitization of its main resources and services.

The digital services and technological platforms developed under the Moldavian e-Government initiative, were integrated in the existing systems and created premises to reengineer the obsolete informational systems. Thus, through the Governmental Interoperability Platform “MConnect”, the basic state registers as Address Register and Real Estate Register can exchange data with other authorities (register of population, fiscal registers). The governmental service for electronic payment “MPay” is integrated with CADASTRU basic digital application which allow to lodge online the application for any document from the Real Estate Register, the payment being possible through the MPay. The national authentication service “MPass” , offering a variety of authentication mechanisms as, mobile signature, digital certificate, or user name and password, is used to access CADASTRU web resources and informational systems which allow for external partners operations (as the one developed to court bailiffs, referred further). Also, the informational systems supporting the cadastral system and the real estate register are and will be located on the governmental technological platform, known as MCloud, based on cloud computing technologies.



Figure 2: Conceptual representation of the real property registration systems and governmental digital services.

Under the e-Government initiative CADASTRU put in place an informational system which is used by bailiffs to issue in a digital form their legal decisions and to lodge them electronically in the Real Estate Register, on a selected real estate object. Thus, the time gap between issuing a legal decision which concern a real property object and the execution of such decisions has decreased, the labour cost decreased and the fraud risk has been reduced.

Another example of successful cooperation could be the project on the cadastral archive digitization. The cadastral files and documents are the most important informational resources. Having as inher-

itance the outcomes of a rapid and sometimes less proper privatization process, as well as a not completed cadastral and real property rights registration system, the cadastral files still serve as evidence for checking the accuracy of the first registration. At the same time, as the cadastral archives are stored in the regional offices, the business processes of the real property registrars could not be changed if the information is not stored and processed centrally. During 2014-2016, in partnership with e-Government Office CADASTRU succeeded to digitize over 1/5 of the cadastral files. The processes will continue.

In 2016, CADASTRU has launched another professional service, which is used by surveyors to submit the surveying reports, in the digital format, to the CADASTRU for verification and approval. Thus, the private professionals could save time and money, making the interaction easier.

Benefits of technologically enabled partnerships

The use of technological innovation has reshaped the traditional way of interacting with our traditional partners: notaries, bailiffs, banks, surveyors, local and central governmental authorities, citizens and businesses. The cadastral map and the real estate register can be consulted online, enhancing the transparency of the data about any registered real estate. The real estate registry is not a black box anymore and is easily accessible for anyone involved in activities concerned with ownership and use transfers of the real estate properties.

As mutual benefits of having integrated business processes or systems are:

- Reduced data fitting work while exchanging data with other state registers (as register of population, fiscal register)
- Reduced capital costs of public agencies as using the governmental digital services and platforms, there is no need to develop own supporting services or data centres
- Reduced time of service delivery and inefficient usage of manpower
- Enhance fraud prevention and corruption alleviation.

Organizational and Institutional Aspects –Strengths and Weaknesses of Different Models

Rik Wouters (Kadaster Netherlands) and Walter T. de Vries (Technical University of Munich)

The discussion of unifying (merging) cadastral organisations and land registries is not new. It has been a topic of discussion and research by the working Party on Land Administration since more than a decade. In 2005 a report from the UNECA/WPLA task force on mergers of cadastres and land registers noted: *'Although separate organisations may administer the land books, the cadastre, and the registers of mortgages and encumbrances, an integrated system is desirable either in one organisation or through electronic linkages'*. In 2013 a new research group started to evaluate the contempo-

rary discourse on mergers and the actual status of integration. This research group formulated three objectives:

- Conduct an evaluation of case studies, comparing countries where agencies had merged and or had not merged.
- Evaluate to which extent land administration benchmark studies correlate to the Worldbank doing business reports on the issue of organisational merges.
- Conduct a qualitative study on how staff members of the respective agencies perceive mergers, integration and extended collaboration.

This research derived 4 publications so far: (Wouters et al. 2016; de Vries et al. 2015; Laarakker et al. 2015; de Vries et al. 2016). The early findings of these collective studies revealed a number of insights on the current status of mergers. The first and most prominent finding is that despite a rational argument in various publications that a single organisation dealing with inter-related services can deal more effectively and efficiently with both internal and external demands (Wang et al. 2012), there is currently no hard empirical evidence available to promote the integrated model of cadastre and land registration organisations, or to suggest that merged organizations are more effective or efficient. When comparing the Worldbank's Doing Business ranks with basic data on where mergers occur and where not, there is no consistent or significant pattern of correlation. This suggests that the success factors of cadastres and land registries are not necessarily related to the merging of organisations, but to other factors which may be involved when collaborating extensively.

Secondly, often mergers discussion can be traced back to either a very hard and discrete change in statutory law, or to a more gradual and continuous demand for more interoperability and more simplification of tasks. Several respondents of survey referred to a new law or to public sector reform on the one hand, and public sector demands for simplifying government on the other hand.

Thirdly, encouraging and intensifying collaboration with information resources is in fact leading to an organizational transformation in which new unwritten procedures and attitudes are manifested leading to new communities of practice. An evaluation of personal experiences revealed that many staff members from one organisation often know the staff members of the other organisation. These personal links, either established through regular personal contacts or through professional network support, facilitate the actual integration of process and work flows, regardless of whether the agencies are merged under a single formal organisational structure.

Lastly, it appeared that the concept of merger itself is ambiguous. Some staff members felt that the organisations were merged once they relied on a single database for their daily work. Others argued that a true merger is rooted in a fundamental change of statutes and organisational leadership. These diverse arguments necessitate a new conceptualization of mergers and of integration. Hence, the research question shifted from 'what are mergers processes' to 'what forms of integration can be referred to as mergers' and 'how do these forms contribute to a fundamental change in organisational quality'.

Wouters et al. (2016) look at these questions and use the analytical framework of the EFQM model (European Foundation for quality management) of 2012 as a basis for a questionnaire responded to by representatives of WPLA, ELRA (European Land Registrars Association), and PCC (Permanent Committee on Cadastres in the EU). The collective responses showed that organizations are perceived to reach the highest degree of integration in collective leadership and joint strategies, and the lowest degree of integration in handling customers and collectively dealing with improvements and innovations. In other words: Mergers and integration primarily focus on the operations instead of a shared customer focus and the perceived degree of integration is substantially higher for the enabler components than for the results components. These results imply that integration is primarily developed and appreciated from an internal perspective and not from a systems perspective, and that results are not improved vis-à-vis the external environment, such as society at large or customers in the more narrow sense.

In the upcoming period two follow up actions are foreseen:

An elaborate review and interpretation of the survey results using the analytical framework based on the EFQM model. Whilst the results point to a clear difference between the merger and integration of internal enablers versus the merger and integration of creating external results and societal changes, it remains unclear so far what this really implies in practical terms for cadastres and land registries. It is therefore necessary to see if any best practices or relevant examples can be further derived from the survey results.

A new report and/or article on the practical and theoretical recommendations for cadastres and land registries, based on all the surveys and narrative analyses carried out so far and combining all findings of the articles on this specific topic. The core questions hereby are to which extent the best practices can be customized or re-contextualised in different countries, and to which extent a narrow categorization of merger concepts would better describe current practices, better derive recommendations for innovation and better predict internal and external behaviour of the respective organizations.

References

de Vries, W. T., P. M. Laarakker, and H. J. Wouters. 2015. Living apart together: A comparative evaluation of mergers of cadastral agencies and public land registers in Europe. *Transforming government: people, process and policy* 9 (4):545-562.

de Vries, W. T., T. N. Muparari, and J. A. Zevenbergen. 2016. Merger in land data handling, blending of cultures. *Journal of Spatial Science*:1-18.

Laarakker, P., W. T. de Vries, and R. Wouters. 2015. Land registration and cadastre: one or two agencies? Paper read at Linking land tenure and use for shared prosperity, proceedings of the annual World Bank conference on land and poverty, 23-27 March 2015, Washington DC, United States. .

Wang, W. Y. C., D. J. Pauleen, and H. K. Chan. 2012. Facilitating the Merger of Multinational Companies: A Case Study of the Global Virtual Enterprise. *Journal of Global Information Management (JGIM)* 21 (1):42-58.

Wouters, R., W. T. de Vries, and P. Laarakker. 2016. Land registration and cadastre, one or two agencies. . In 17th Worldbank conference on Land and Poverty. Washington, D.C., USA.

Land Registry in the Slovak Republic – Strengths and Weaknesses

Lucia Filagová (Geodesy, Cartography and Cadastre Authority of the Slovak Republic)

One of the fundamental human rights enshrined in the Basic Charter of Rights and Freedom and also in the Constitution of the Slovak republic is the right to own things. Land register as the registration of real estate and rights to them registered serves to demonstrate ownership rights. Rules for its operation are contained in the cadastral act, implementing decree and other acts. This activity is carried out by administrative authority in the field of cadastre. Cadastre is complicated, expensive and extensive work. Cadastral documentation contains a lot of data. These data were creating for a long time. Not all stages of development have been favourable for the accuracy and credibility of its contents. Cadastre always builds on previous results and is influenced by political and economic stability of the state. Very important is continuity of its development. Land registry also has to deal with the negative consequences of its historical development. Because of this development, there exist some mistakes in the cadastral documentation and it can be considered as a deficiency. Cadastre, however, has many qualities, that are very important for the citizens. Cadastre seeks to respond to the current modernization and digitalization of the society.

Cadastre and Land registry in Slovak republic is one information system managed by state authority. It consists of written information and map information, statement, description and geometric expression of real estate. Below I will use only the word cadastre for both systems.

A unified system

Real Estate Cadastre is a unified information system containing data about real estate and rights regarding the real estate. It allows comfortable provision of comprehensive information about certain properties including legal relations to it. The operation of a unified information system is cheaper than running two separate specific information systems. Cadastral documentation is public. It is an information system that provides information to all persons without proving legal interest. Public of cadastral documentation is based on the formal publicity. It serves to protect property rights. Everyone has the right to make notes, extracts or sketches from it.

History

Slovak republic was a part of Hungary and rules for creation, management and handling with the land book was set by Judexkural Conference in 1861. It was maintained Austro-Hungarian Empire Act. 222/1855 of 15/12/1855 about establishment and management of land registers.

Public books were official records kept by state authorities. Every citizen could look into it and make extracts from them. Records regarding real estates were carried out under the public supervision of state authorities. Public books have now only recording and control importance. Public books were for example land book, railway book, water book and mining book.

Before the year of 1951 ownership of real estate was acquired by registration in land book. Legal title for the registration was contract and the writing was carried out by land court. Effects of the transfer of ownership had constitutive character. Property/ownership rights were created and terminated only after registration into the land book.

Since the efficiency of the Civil Code No. 141/1950 Coll., i.e. since 01.01.1951 the writing into the land book wasn't a condition of transfer of ownership. Registration in land book was merely declaratory in nature. The ownership was transferred by conclusion of the contract. It is called consensual principle. In contracts that were concluded before 01.01.1951 and were not entered in the land book the transfer of ownership took place 01.01.1951. This caused widespread and long-standing discrepancy between actual legal status and status registered in the land book. It wasn't possible to rely on and trust information registered in land book.

Land books were kept by the court until 1964. The implementation to the land book was stopped on 01.04.1964, when the Act No. 22/1964 Coll. on registration of real estate entered into force. Foundation of deeds passed within the competence of the land registry - Centre of Geodesy in individual districts. Land books got into the state notary's deposit.

The main principles of land book in the past

The main principle of land book was principle of intabulation. Ownership of real estate was acquired by registration in land book. Transfer of ownership, in Slovak republic called „vklad“ and record of ownership, called „záznam“ were enrolments with constitutive effects.

Next principles were principle of transparency, principle of freedom, principle of legality, principle of trust in land book, principle of priority, principle of public policy, principle of compliance of land register with the land cadastre.

Land books were kept by the court. Court examined whether the documents submitted for registration were in accordance with the law.

The main principles of cadastre now

The principle of registration – intabulation – property rights and other rights in rem arise, change or terminate by registration into the cadastre.

The principle of public - formal publicity - everyone is entitled to inspect the cadastral documentation and make statements, depreciation or sketches from it.

The principle of credibility - material truth - cadastral data are credible and binding, unless the contrary is proved. What is written is true. It protects every confidence in the accuracy/correctness of cadastral data.

The principle of freedom - the proceedings of proposal for application shall be initiated only upon application/proposal of the party.

The principle of legality - cadastre is required to examine the conditions for the possibility and validity of land registration.

The principle of priority - the rights regarding the same property shall be entered in the order in which the contracts, public documents or other documents for registration are delivered to cadastre.

The principle of specialty– it serves to ensure certainty, clarity and transparency of all recorded data.

Purpose of use of the cadastre:

- the purpose of the law, i.e. to protect the rights of real estate and protect the ownership,
- tax purposes to determine amount of the fee,
- the valuation of real estate, particularly land,
- the protection of agricultural land and forest land,
- the creation and protection of the environment,
- the protection of mineral resources,
- the protection of national cultural heritage and other cultural monuments,
- protected areas and natural formations and other building systems property.

In principle, the land registry data base is represented by the geodetic and cadastral data. These data are publicly available (except for exceptions defined by law) and serve for other purposes or as a basis for other territorially-oriented information systems.

Cadastral authorities in Slovakia

During the year 2013 it was realized very serious changes in organizational structure took place. The responsibility for the running of state authorities in the field of cadastre has changed. To 30.09.2013 were cadastre activities at the central level and at the local level in one public institution and in pyramidal hierarchical organizational structure.

Before 01.10.2013

Geodesy, cartography and cadastre Authority of the Slovak republic was a central state administration and conducted other cadastral offices.

Local cadastral offices were:

8 Cadastral offices which seated in regional capitals. They carry out state administration in the field of cadastre in the territory of region and carried out state administration at the second level. The first level held cadastre. Employees of cadastral offices and cadastre were employees of cadastral offices.

72 Cadastral administrations carried out state administration in the field of cadastre within the territorial jurisdiction of the district in the first instance.

Local government authorities were personally and financially connected to the Geodesy, cartography and cadastre Authority of the Slovak republic.

Since 01.01.2013 Cadastral offices were cancelled by the Act No. 345/2012 Coll.

After 01.10.2013

On 01.10.2013 entered into force Act. No. 180/2013 Coll. on local state administration. Scope of cadastre passed to district authorities, cadastral departments. These authorities aren't directly under the control of Geodesy, cartography and cadastre Authority of the Slovak republic.

1.) Geodesy, cartography and cadastre Authority of the Slovak republic is the central state administration in the field of cadastre. Methodically manages and directs the performance of state administration in the field of cadastre. It also performs cadastral inspection and state supervision of management, updating and renewal of the cadastre. Preparing a draft law on cadastre and also ensures international cooperation in the field of cadastre.

2.) District offices in regional capitals carry out the second stage of state administration in matters in which first instance is carried out by the district offices in the field of cadastre. There are 8 District offices, because Slovak republic has 8 regions.

3.) District offices, land registry department carry out the first stage of state administration. It decides in the administrative proceedings, registration of rights to real estate, manages and updates the cadastre, issued by public documents, checks geodetic and cartographic activities, manages land book and railway book and also provides information from the land. There are 72 district offices, land registry department and 3 offices of district authorities, cadastral departments in the Slovak republic.

Local cadastral offices are personally and financially connected to the Ministry of Interior of the Slovak republic. Ministry of Interior also provides material support for these authorities in the field of cadastre.

Decision on proposals of registration

The decision on a proposal of registration is issued by employee of the Ministry of Interior of the Slovak republic. This employee has university education in the field of law or geodesy and also special professional qualification. Special professional qualification includes theoretical and practical knowledge, experience and knowledge of the legislation in the field of cadastre. The special professional qualification is decided by five-member committee of the Geodesy, cartography and cadastre Authority of the Slovak republic. Decision concerning this special professional qualification is issued by the Geodesy, cartography and cadastre Authority of the Slovak republic.

In the past, the writings to the land register were decided by the judge, then state notary. It is questionable whether it would be more effective if the proposals will be decided by the judge.

We consider that the proposal should be decided by higher court officials and judges would decide only complicated cases. Now decision on proposal is decided by the employee in civil service, which is certainly cheaper than if the proposal will be decided by the judge.

Enclosure of the proposal can be for example a survey sketch, which is technical basis of the legal action. The advantage is that the employee deciding the proposal may consult technical matters with another employees working for the Technical Department. On the other side the judge is a professional with a legal background and his colleagues have only a legal, rather than technical education. This aspect also can be seen in the court proceedings whose object is for example damages, declaratory relief, an action for review the legality of the decision, relating to real estate. It often happens that the judges do not understand the technical aspects of the dispute.

The period for decision

Administrative authority has to decide within 30 days period since the proposal is delivered. If the contract is made by notary or contract is authorized by attorney at law, the period for issue the decision is 20 days. The administrative authority may on application issue the decision within 15 days since the proposal is delivered. Party has to pay an extra administrative fee of 266 EUR. The period for decision may be considered as a benefit and this period is shorter than court decisions.

Fees

The advantage of the current system of cadastre is also relatively low administrative fee to file the application/for proposal. In accordance with the Act No. 145/1995 Coll. on administrative fee the basic administrative fee is 66 EUR. Administrative authority has to decide within 30 days since the proposal is delivered. When the extra fee of 266 EUR is paid, the

administrative authority has to decide within 15 days since the proposal is delivered. When the electronic filling make by notary is delivered, administrative fee is 33 EUR, or 133 EUR for the accelerated procedure. Administrative fees are lower than court fees. Through cadastre portal "www.katasterportal.sk" can be given notice of the intended proposal. In this case, the fee is reduced by 15 EUR. If the proposal is in e-filing and its enclosure is this notice made through cadastre portal, an administrative fee is 18 EUR.

Electronic filing

On 01.09.2009 the Cadastral Act was amended. Before this date the proposal could be only in paper form. Since this date the proposal can be also in electronic form. All enclosures must be e-filing electronically. Only one proposal and one copy of enclosures is filled. When the proposal is in paper form, it has to be two pieces of contract. The administrative fee is 33 EUR.

Protection of property

Protection of property rights is guaranteed in the Constitution of the Slovak republic. It has the highest legal force of law and is fundamental law of the state. Illegal decision issued by the administrative authority can be achieve through an action in accordance with the Act No. 162/2015 Coll. on Administrative Procedure.

On 01.07.2016 the Act No. 160/2015 Coll on Civil litigation codex entered into force by which was also indirectly amended the Cadastral Act. Before this date party could appeal against decision by which was rejected a proposal. Appeals were decided by Regional Court. Since 01.07.2016 the appeals are decided by the Geodesy, cartography and cadastre Authority of the Slovak republic. This decision can be review by a court. The legality of the decision of the administrative authority in the field of cadastre is still ensured.

In order to speed up proceedings and greater legal certainty, the parties can not appeal against decision by which was authorized the transfer of property. Also extraordinary remedies in accordance with the Act on Administrative proceedings, for example retrial and review the decision beyond an appeal cannot be used. The prosecutor may file against the decision protest of the Prosecutor in accordance with the Act No. 153/2001 Coll. on prosecution.

The disadvantages

The disadvantage of the current real estate cadastre is a great fragmentation of land ownership, incompleteness and imperfection of cadastral registrations, unsubstantiated ownership relationships, too many plot owners of one property, negligible area and etc... It is the result of historical development in the Slovak republic. The extreme fragmentation of land ownership in terms of its technical side, i.e. the size of the original lands registered in land book,

large-scale joint ownership of different persons on the same grounds. In individual cases, the object of ownership is tiny area and therefore the negligible value of the property. Fragmentation of land ownership makes it difficult for land registration, decision-making and administrative bodies are a source of neighbouring and other ownership disputes.

Development in Slovak republic

The development of cadastre in Slovak republic significantly affected the technical trends such as automation systems, scanning, digitizing, problem solving and the application of global satellite navigation systems in geodetic measurements. Great benefit for citizens is the fact that the information from cadastre since 01.02.2004 is accessible on the Internet. This information is provided free of charge in accordance with the Land Registry Act. Information about the property, owners, construction or relationship is currently provided by free public portals. Citizens can find this information at www.katasterportal.sk, www.cica.vugk.sk, or indirectly via ESKN (electronic land registry services). Within the ESKN portal a special service called "Mapka" is accessible that provides information about each property, including their location on the cadastral map. Information obtained from the cadastral portal is informative and for example a deed printed from this website is not an official document. The public document is only a certified statement or a photocopy of the document, which is issued by the district authorities, cadastral department. This document has to be marked by the official stamp and administrative fee has to be paid in accordance with the Act No. 145/1995 Coll.

Conclusion

Geodesy, cartography and cadastre Authority of the Slovak republic provides summary data about the property or owners throughout the territory of the Slovak Republic upon request. Individual district authorities, cadastral departments provide information about the owner or the property only in their jurisdiction, i.e. only in the administrative area, which fall under their jurisdiction.

It can be said that the benefits of the current cadastre is the application of the principle of credibility – material truth. It's full of confidence of the data entered and plotted in cadastre. Legal and geometric condition recorded in the cadastral documentation should be considered as complete, credible and accurate. There is assurance that everyone who uses these data won't have their rights violated. The opposite can be demonstrated by deed or other public document, which confirms ownership of the property. Data which credibility is in question cannot be used. In case that in the ownership document is a note that the authenticity of the data is contested, owners can agree and draw up a settlement agreement or they can go to court with their claims.

Session 2 – Role of CLR in Relation to Geodata Infrastructure

UN-GGIM: Europe Core Data and its Impact on Cadastral Themes

Dominique Laurent (IGN, France)

The INSPIRE Directive has set up the legal and technical framework for harmonising the existing data related to the themes of annexes I, II and III. INSPIRE specifications provide common data models that ensure the first step towards interoperability; however, as INSPIRE technical guidelines are quite flexible (for instance, most of the features and attributes of these data models are “voidable”), it is likely that different INSPIRE datasets will not be homogeneous in their content and level of detail.

This background led the UN-GGIM: Europe Regional Committee to setup in 2014 the Work Group A (WG A) on Core Data. Core data can be seen as the authoritative, harmonized and homogeneous framework data which both national and international users need to either fulfil their requirements or to geo-reference and locate their own thematic data.

Core data specifications will complement the INSPIRE initiative by defining the priorities on the core content that will be recommended to be made available, either by harmonising existing data when practicable or by producing new data when necessary.

The first phase of WG A has been to define core data themes among the 34 INSPIRE themes. To carry out this selection of core data themes, WG A applied a methodology consisting mainly in a bottom-up approach based on identifying user needs, with focus on the Sustainable Development Goals (SDGs) agreed by Member States in the framework of the United Nations 2030 Agenda for Sustainable Development. Therefore, defining the core data scope has consisted in selecting the INSPIRE themes that are the most widely required by the SDGs.



Figure 2: The 14 Sustainable Development Goals.

As a result, 14 INSPIRE themes have been considered as core:

- INSPIRE Annex I: Geographical Names; Administrative Units; Addresses; Cadastral Parcels; Transport Networks; Hydrography.
- INSPIRE Annex II: Elevation; Land Cover; Orthoimagery.
- INSPIRE Annex III: Statistical units; Buildings; Area management/restriction/regulation and reporting units; Land use; Utilities and Governmental services.

The second phase of WG A is now, for each selected theme, to decide on the technical specifications that should ensure homogeneous data on whole geographic Europe, from geometric point of view (e.g. homogeneous levels of detail) and from semantic point of view (e.g. mandatory content for the selected feature types and attributes). These future specifications should be profiles of the INSPIRE ones, they are expected to be both less demanding regarding the number of filled feature types and attributes but more demanding regarding the quality aspects.

Typically, WG A is now preparing data specifications for cadastral themes, namely Cadastral Parcels, Addresses and Buildings. The general objective of the presentation is to explain the draft decisions and the remaining open issues related to these three themes and ideally to get feed-back from the audience, in order to check if the WG A recommendations are considered as relevant by the cadastral community.

In general, WG A data specifications will be based on the INSPIRE ones, mainly by selecting core content from the latter and by adding quality requirements to ensure homogeneous data over Europe.

The INSPIRE data model for Addresses is quite complex but this complexity is necessary to accommodate the various address systems in Europe. WG A might add value to INSPIRE by narrowing its scope (by clarifying what are the core addressable objects) and by encouraging accurate localization of addresses (e.g. at building or at property entrance levels).

In opposite, the INSPIRE data model for Cadastral Parcels is quite simple but it may also accommodate the various cadastral maps of Europe. WG A might add value to INSPIRE by extending its scope (by encouraging whole geographic coverage of cadastral data) and by encouraging good quality data: completeness, topological consistency, reasonable accuracy and better temporal consistency between the cadastral map and the land registry.

The INSPIRE theme Buildings is quite rich, with lots of attributes and with both 2D and 3D possible geometric representations. WG A will have to define priorities and to select core content from it. So far, the trend is to restrict the scope to 2D data; core attributes should include at least height and/or number of floors, year of construction and current use; however lots of other INSPIRE attributes are also quite useful regarding the SDG. The information about Buildings may be disseminated in several databases from various data producers and efficient ways to link these various sources of information have to be investigated.

Role of National CLR Systems in the ELF-Cadastre Project

Amalia Velasco (Directorate General for Cadastre, Spain)

There are growing demands and expectations for highly detailed, authoritative, harmonised, cross-border geospatial information for evidence-based decisions; both from Institutions and Citizens and companies.

Cadastres are asked to offer information to the European society to promote added value

initiatives that encourage the development ; facilitate the access to information of real estate to make possible the exchange of real estate between people of different countries and promote cadastral information as support to the European politics that act on the territory, environmental, fiscal, safety and emergencies, etc.

For example the United Nations Committee of Experts on Global Geospatial Information

Management (UNGIM) wants to promote the connection between statistical and geographical information because it is essential to conduct high-quality (demographic, economic, environmental, health, etc.) surveys; to do monitoring and spatial analysis; as well as to represent and disseminate statistical data. They include Cadastral data between core data for this combination

Also in Copernicus program, EEA would like being able to use the official information of the member countries, but it meets problems: the information is not standardized; there are different models of access to the information and also different regulatory requirements.

Copernicus is not only thinking in large data, in the Copernicus in-situ program and in the Copernicus emergencies service, "buildings" are included and in the Copernicus Reference Data Access portal (CORDA) that is created as single access node providing links to up-to-date relevant authoritative geospatial reference data, cadastral parcels, buildings and addresses are also included.

For these reasons and many more, cadastral institutions should harmonize data and services; describe them in a common semantics; establish agreements between the institutions and harmonize the access to them.

Would ELF be the solution?

ELF, the European Location Framework is a cloud-based and cascade supporting architecture platform that provides INSPIRE compliant geoinformation.

The goal of this project has been to deliver up-to-date, authoritative, interoperable, cross-border, reference geo-information for use by the European public and private sectors.

The objectives of ELF are:

- to build a high performance platform and associated cloud services that support multiple national feeds and a wide spectrum of value-added services
- to demonstrate the usability of the ELF platform and cloud services for key European policy areas and other users including SMEs
- to develop sample applications
- to integrate of 3rd party thematic datasets and National Spatial Data Infrastructures for service implementations based on specific user needs

ELF brings INSPIRE to the practice for 12 themes included CP, AD and BU.



Figure 3: The Cadastral Index Map as one of the products of ELF.

ELF Cadastral Index Map (CIM) is a view service that provides a simplified and harmonised view of footprints of cadastral parcels geometry combined with other basic information as administrative units, addresses and buildings for pan-European use.

It is a Service of Cascade that permits the access from a single point to a continuous map of cadastral data for the whole of Europe.

ELF Cadastral Index Map is not one single map layer. It is composed by theme specific map layers. As data comes from different INSPIRE themes and could be provided by different NMCA's; occasionally some of them may be missing. Each theme has its layers and the styles are defined for each layer. This will also make the ELF cadastral Index Map visualization more flexible, as the layers can be individually switched on and off.

CIM is totally conform with INSPIRE y the Cadastral Agencies only have to provide INSPIRE CP, BU, AD, AU WMS.

The main ELF Cadastral Index Map features that are represented in the layers are: Cadastral Parcel, Address, Building, Building part (if any) and AdministrativeUnit and the Optional features: Cadastral Zoning, Cadastral Boundaries and Basic Property Units.

The European national Cadastre are very different between them. It is impossible to seek the harmonization of all aspects of European Cadastres. Therefore with INSPIRE only the minimum common data has been harmonized.

In the ELF context, (as in INSPIRE) cadastral parcels will be mainly used only as locators for geoinformation. National cadastral registers generally contain much more data and users will be able through ELF Cadastral Index Map to identify the objects and obtain the national reference; and through it to obtain other valuable information through the national services.

Therefore the national ELF services shall support the GetFeatureInfo functionality for Cadastral Parcel and Addresses. With it, CIM permits to identify the features and to obtain both:

- the national cadastral reference of the cadastral parcel, that gives users the opportunity to get more information through the cadastral national services,
- and the complete address of the cadastral parcel or building.

Two GFI-capable layers are expected: Cadastral Parcels and Addresses.

Attribute	Value
inspire_nominale	EN SLOVACIA
inspire_localid	19073019601014
inspire_objekt	2501 012
inspire_klasifikacia	2015-04-20T05:00:00
national_cadastral_reference	19073019601014
LINK to national cadastral reference	LINK TO NATIONAL CADASTRAL REFERENCE

GetFeatureInfo (GFI) for cadastral parcel must return at least the national cadastral reference and if possible a hyperlink (URL) to access the national system.

INSPIRE cadastral parcel has few attributes. Therefore could be possible to provide the table with the attributes and the national value of them, or leave it blank if the data-provider does not have it.

AD ADDRESS	Value
PS GRSTELLANA, 27C 2640 VACURO	

Also identify each address that is displayed in the ELF Cadastral Index Map with the GetFeatureInfo for address.

Figure 4: Cadastral parcels and addresses.

A template for the recommended GFI style in XML and HTML formats is provided at

<http://locationframework.eu/portrayal/>

The representation of the ELF CIM is based on INSPIRE data specifications of each of the layers, with minimum necessary changes.

To display CIM ELF style there are 2 possibilities: or the national services provide directly the ELF style, or using the ELF SLD and then ELF platform is responsible to display correctly.

CIM is the more detailed map of ELF, and it is accessed from other topographic maps with harmonized information for other topics of INSPIRE (Basemap)

As this Basemap (topographic and administrative), there are other ELF products and Services; the Geolocator (georeferencing service that serves multilingual European geographical names data Themes: AD, AU); the cascaded services that permit download INSPIRE WFS from the national services in real time by a single point of access, etc..

Also in ELF, ArcGis Online and other affiliated platforms permit delivery ELF products to users have been developed; and there are many other tools, testing services and applications developed in the project.

The ELF Cadastral Index Map and the WFS of CP, BU, AD, AU will meet the requirements of the main use cases that need CP, BU and AD as geolocators of human activities; for example: Real Estate Information; Insurance risk assessment application; Companies that utilize the ELF map together with various reference data themes and hazard data layers; E-justice Portal where ELF Cadastral Index Map can provide the geographic information that is needed to access to the legal information; and the European Land Information Service (EULIS); between others.

The access to ELF products will be unique and a system of ELF license has been developed under the principles of

Simplicity, Licensing must be easy to understand and apply to the user's needs, and Harmonized terms and conditions: Incorporating the data providers' national requirements.

We can conclude that to satisfy the demand for Cadastral data by the EC and the European citizens and businesses; in spite of the problems of heterogeneity of cadastral data in Europe, we have a solution: ELF

Property Valuation in Denmark – New Valuation Model Based on Geographical Variables

Pia Dahl Højgaard (Geodata Agency, Denmark)

Property valuation in Denmark at present

In Denmark property owners pay two types of tax on real property; Property Value Tax and Property Tax (Land Tax). The tax rates are based on the public property values which are determined by the Ministry of Taxation. Until 2002 the public property values were determined by municipal Valuation Boards.

The Property Value Tax is assessed as the value of the immovable property (based on registered traded values in the neighbourhood and the type of property) and is paid to the state.

The Property Tax is assessed as the value of the land (based on size and possible land use) and is paid to the municipality.

Since 2002 the Property Value Tax has been subject to a parliamentary decision not to increase the tax levels. There are also limits to how much the Property Tax can increase per year.

Private owned properties are assessed every second year and the intermediate years business owned properties are assessed.

Criticism of the property valuation and proposal for new assessment methods

In 2013 the National Audits Office criticized the Ministry of Taxation for a 'poor quality' of the property valuations.

Based on this criticism the Parliament in December 2013 decided to suspend the public property valuations and to initiate elaborations to find a new model for public property valuation. Since then the public property values have been fixed at the 2011 values for private owned property and at 2012 values for business owned properties.

An Expert Committee was established to develop a new property valuation system. The committee delivered a White Paper in September 2014 including a prototype showing that it is possible to establish a more transparent property valuation system based on data, geographical variables and modern statistical methods. Based on the principles laid out in the White Paper a special unit at the Ministry of Taxation (Implementation Center for Property Valuation, ICE) has been working together with the real estate sector, credit institutions, banks and universities as well as relevant government agencies to develop a data driven valuation model with more precise, more uniform and transparent property assessment methods.

The minister for Taxation has put forwards a proposal to introduce the new methods for the 2019 valuation of private property. The parliament is in the negotiation process on this proposal. Thus the methods are not yet fixed and at present the presentation cannot be shared beyond the conference.

Session 3 – Role of CLR in Societal Issues

New Environmental Planning Act in the Netherlands: role and added value of a cadastre

Martin Salzmann (Cadastre, Land Registry and Mapping Authority of the Netherlands, Kadaster)

Introduction

The Environmental Planning Act is a bill which aims to renew the regulation of human activities with an effect on the physical environment.

Why an Environmental Planning Act?

The purpose of the Environmental Planning Act is twofold. With a view to sustainable development it sets out a coherent approach to achieve and maintain a safe and healthy physical environment and a good environmental quality, and it enables the efficient management, use and development of the physical environment for social purposes.

One of the principles in drafting the Act was to align it with EU legislation. A comprehensive strategy describes the policy objectives and quality standards for the physical environment. These can be achieved through plans/programmes and permits or general binding rules, which will be monitored and enforced.

This overall constitutes a major legislative operation. At the same time an implementation is required that enables users easily to submit applications, takes care of having the proper information available for all parties involved and operates in a highly automated, rule-based and yet transparent way. The following objectives are to be achieved:

- User centred process: more focus on initiatives citizens, businesses;
- Effective, transparent and efficient public sector all levels of government (national, provincial, municipalities, water boards);
- Sustainable physical environment.

This in its turn requires a highly digital working environment, which makes the act a digital act. The fundamental principles underlying the act are:

- Shared information position for all stakeholders involved;
- Streamlined processes based on a one stop shop principle for applicants;
- Interoperable data (at the technical and semantic level) and processes;

- Link to eGovernment and the key registers;
- Data that are fit for purpose, available/accessible and can be upheld in court;
- The execution should be tuned to both handling large and small projects.

These characteristics make a cadastre seem a natural partner in playing a major role in implementing the (digital) application of the Environmental Planning act. At the same time modesty is required as issuing of integrated environmental permits requires a huge amount of data and rules and regulations to be applied (especially for larger projects). Figure 1 gives an overview of the data-domains that are at stake in creating sound decisions on the environment.

Our experience was that involvement of the Kadaster was not straightforward, even with the following competences we have:

- Experience with (legal and spatial) registers and registrations;
- Holder of a number of spatial key registrations and the cadastral registration;
- Experience in providing authoritative legal and spatial information to the whole society.

We found that the planning and cadastral domains not automatically interact. Furthermore the number of parties and interests in providing integrated environmental permits, making project decisions and executing environmental impact assessments (EIAs) is large. Making the digital processes a success requires a network approach from all parties involved. That is a process which takes time.

Despite these effects we are now actively involved in making the digitisation of the environmental planning act a success. All parties involved will reach their objectives step by step. It is foreseen that a first release with basic functionality will be operational in 2019. After that 5 more years are needed to unlock the full potential of all information (data and rules) to make the act in practice fully digital.



Figure 5: An overview of the data- themes that are considered in relation with the environmental planning act. The themes and datasets hosted by the Kadaster are marked by the logo of the Kadaster.

For further reading/viewing:

<https://www.omgevingswetportaal.nl/publicaties/documenten/brochures/2013/08/europa/simpler-and-better> and <https://www.youtube.com/watch?v=Bim2gbN09vA>

Wrapping up of the Marine Cadastre Project: Looking into the Future

Evangelia Balla (Ktimatologio. Greece) and Rik Wouters (The Netherlands)

Throughout human history considerable efforts and resources have been directed at effectively managing land whereas the marine environment has been given a lower priority. However over 70 percent of the planet's surface is covered by water, the majority of which is in the world's seas and oceans which are vital for supporting human well-being by contributing to poverty eradication, food security, creation of sustainable livelihoods and jobs, and protection from natural disasters. Moreover the ocean is valued at more than US\$24 trillion while the annual "gross marine product" totals at least US\$2.5 trillion, which when ranked among national GDPs makes the ocean the world's seventh largest economy (WWF, 2015).

On the other hand, oceans and seas are also a valuable asset for the European Union (EU). The EU's maritime economy alone employs more than 3.6 million people, creates a gross added value of just under €500 billion per year, with a high potential for further growth. Europe is and will be increasingly dependent on oceans for the provision of fish protein, minerals and renewable energy whereas 90% of the EU's external trade and 40% of internal trade is carried on sea routes.

The five leading European organizations dealing with Cadastre, Land Registry, Mapping and Surveying issues (CLGE, ELRA, EULIS, EuroGeographics, PCC) acknowledge the great potential of the Blue Economy in Europe as well as the impact of efficient planning and a better allocation of human activities in the sea and their interrelation to a sound registry system as a basis for legal certainty. These organizations decided in June 2014 in Athens, Greece to join forces to collectively better understand the Marine Cadastre concept and its role. In this regard, a project team consisting of experts either affiliated with the 5 Common Vision Partners or with universities and institutes in EU Member States, was founded to carry out a preliminary study, with an orientating character, aiming at reviewing the status of the Marine Cadastre across the European Union. The objective of this preliminary study is to raise awareness about the topic of the Marine Cadastre and to trigger the discussion about its potential benefits for Europe's Blue Economy. The project was based on primary and secondary research criteria and encompassed three major tasks. The first task included the design and dissemination of a questionnaire through communication channels of the 5 Common Vision partners to national experts. The second task included the documentation of the current legislative and policy framework of the European Union as well as of related EU's initiatives and tools to support maritime policies. The third task encompassed the analysis and synthesis of relevant research, data and information on the topic of the Marine Cadastre worldwide.

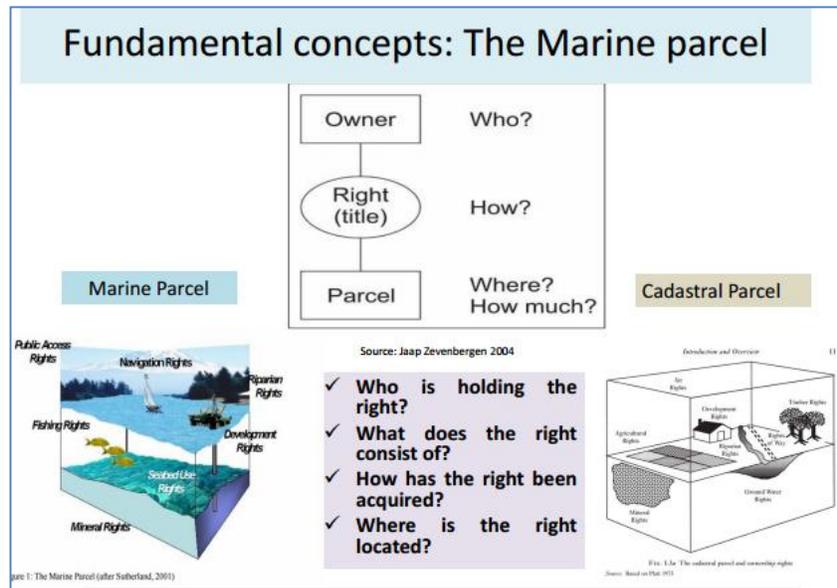


Figure 6: Fundamental concept of the marine parcel.

One of the findings of the research was that there was very little formal marine cadastre efforts across Europe and that peoples' understanding was hindered and confused due to a multitude of projects that when compared for consistency did not use common terms, language or scope of work etc. This is somewhat of a contradiction as the top down legal and regulatory framework of UNCLOS and the requirements to manage the various sea areas as they are defined would suggest a consistent approach to the terms and scope of work involved. However across Europe the implementation has been at a local or sub-regional level with few involving cross-border efforts and therefore little or no requirement to adopt internationally consistent terms. The existing projects are largely about Marine Data Infrastructures and Spatial Planning rather than dealing with spatial data and the rights, access and tenure in the land registry and cadastre sense.

Further, the work indicated that, whilst there are good economic motives and growth scenarios for a number of the key marine industry sectors of the Blue Economy, there is largely a lack of cohesive data, at sufficient detail, to facilitate the development and sustained planning and support for the relatively new and potentially very beneficial sectors identified. A challenge is to identify marine areas that can sustain the possible Blue Growth developments (e.g. where is bio-medical farming or extraction of minerals sustainable). Once the areas are identified they will inevitably gain importance, value and ultimately risk if not appropriately managed in a consistent and clear manner for cross border communities to support and sustain for the widest community to benefit.

Ultimately this study has not identified strong and compelling links that require a Marine Cadastre to support the Blue Economy in order to achieve success. Besides, it was out of the scope of this study to provide definite recommendations and conclusions on the design and development of a Marine

Cadastre or provide evidence on direct links between Marine Cadastre and the Blue Economy and solid documentation on its' economic effects. This kind of research requires inevitably a different methodological approach as well as organization and implementation of such a project. However the evidence points to if a Marine Cadastre is implemented then a more consistent and efficient planning and management could occur with a much more likely sustained series of benefits to society. Overall the preliminary study on Marine Cadastre focused on the identification of the field area in Europe, reaching high level conclusions from the analysis of the current state and proposing initiatives that could provide further insights at a European and national level.

The current presentation is aiming to exhibit the final outcome of the joint effort of the 5 Common Vision Partners on the Marine Cadastre in Europe, to demonstrate potential indicative areas for further action and to outline the next steps related to the dissemination of the results of the completed project and to a possible follow up initiative.

Using Blockchain Technology for Land Registration

Shota Chachkhunashvili (National Agency of Public Registry NAPR, Georgia)

Land Registration State Project

National Agency of Public Registry (NAPR) under the Ministry of Justice of Georgia, is a land administration authority being responsible for registration of immovable property rights and cadastral database in Georgia.

On August 1, 2016, NAPR launched a state project of land registration. Its implementation will significantly speed up full coverage of the country with high quality registration and cadastral data, which is a prerequisite for sustainable land administration system and land market development.

The state project - reform removes barriers to land registration and allows citizens to register land easily and free-of-charge. It offers simplified procedures concerning legalization of land ownership rights, addresses the problem of "overlapping of land boundaries", and introduces alternative dispute resolution mechanism – mediation. The enquiry and collection of the needed documents from other administrative authorities are done by NAPR. All services within the reform are free for citizens, including cadastral survey. Consequently, it drastically increases accessibility of registration service to entire population of Georgia.

The state project of land registration is underpinned by appropriate legislative framework and technical support.

The new legal framework has introduced efficient and effective legal mechanisms for solution of the registration related problems and has fully encompassed necessary legal and procedural aspects for simplification of land ownership registration.

In order to simplify operating procedure next systems were integrated with immovable property registry (see Figure 7):

- Electronic Management System (EMS)
- Visit Planner (with Notary)
- Bauer of Technical Inventory (BTI)
- National Agency of State Property (NASP)
- Call Back – System for Hotline of Public Service Hall

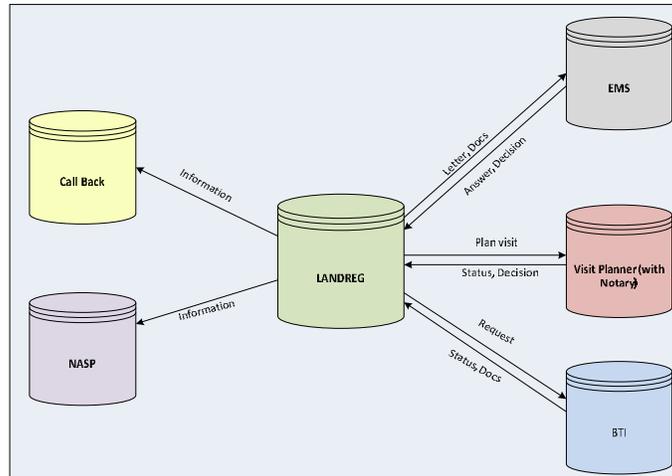


Figure 7: Integration of several systems into immovable property registry.

A registrar works only in one program and uses other systems like web service, which are necessary in property registration process.

Exhaustive information on land registration reform is provided on the official website of NAPR. Publicity of all data ensures operational transparency and engagement of private owners.

The 4-month statistical data shows sharp increase of registration number and interest of citizens is growing daily. Up to date over 90 thousand applications have been filed for land registration. It is expected to receive approximately 360,000 applications per year.

Using Blockchain Technology for Land Registration

National Agency of Public Registry is a property registering authority in Georgia with one of the most advanced and experienced IT Department providing its service not only NAPR but to other government agencies as well. It is critical for NAPR to ensure protection of the data. To guarantee data security and protection, new technologies and possibilities are researched and integrated in existing solutions. One of such solution is Bitcoin blockchain.

The extracts published on the official NAPR website are legal documents and it is especially important for NAPR to secure the system from malicious use and social engineering attack. Considering the responsibility of NAPR for protection of the documents, an organizational signature service was created and introduced at NAPR. Upon generation a new extract from any service, a PDF file is sent to signature service. The service keeps keys in a special Hardware Security Module device certified by FIPS 140 Level 2 and Common Criteria. HSM guarantees that no one will be able to dump NAPR public keys to generate fake receipts.

The signed PDF can be validated offline. But public key signatures require trusted third party that will act as Certificate Authority. So all files are protected as long as CA is protected and trusted. To make the NAPR registration system even more trustful and useful, the digitally signed files are timestamped using Bitcoin blockchain. A hash of a file is sent as bitcoin transaction that will be permanently registered in blockchain.

Bitcoin's blockchain is the best security store ever created by mankind. Besides it is distributed and transparent, anybody can validate transactions and the risk of data altering is insignificant. As new blocks are added to blockchain, its security strengthens. There is no practical way to alter even one transaction that was made an hour ago without huge financial investment.

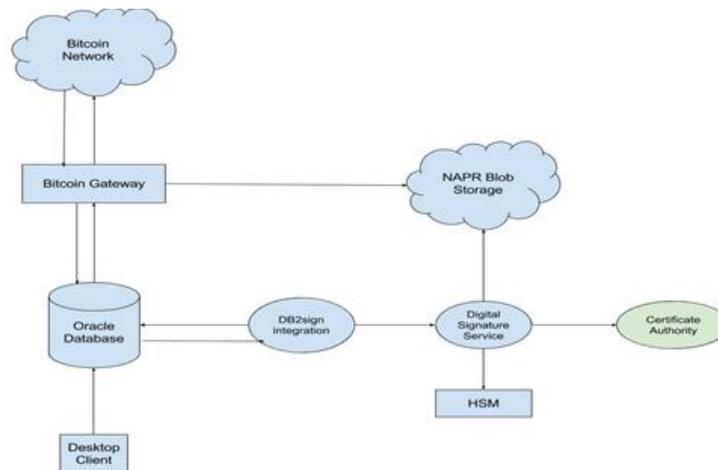


Figure 8: Bitcoin Network.

Architecture of Blockchain

The whole process involves the following steps:

1. PDF extract is generated at registrar's desktop client application and is sent to database;
2. Db2sign service takes new receipts from database, makes some adjustments to a file to get it ready for signing. At last sends file to digital signature service.
3. Digital signature service makes several steps to make a valid signature:

- a. Generates hash of PDF file;
 - b. Sends it to HSM, because there is no way to read private key from HSM;
 - c. HSM makes a digital signature and returns signature data;
 - d. Signature is put in PDF file and sent to Certificate Authority for OCSP check (The Online Certificate Status Protocol) to check certificate validation status;
 - e. CA also makes a timestamp on a file (required by Georgian law).
4. Signed PDF file is sent to blob storage, where it is saved permanently. On blob storage files are immutable, they can't be deleted or edited.
 5. Bitcoin gateway makes transaction to Bitcoin blockchain, the process consists of following steps:
 - a. Gateway reads the newly signed files from blob storage and generates its hash;
 - b. A new bitcoin transaction object is created that contains files hash;
 - c. The transaction is sent to Bitcoin network;
 - d. After transaction is validated by blockchain its status and meta information is sent to application Oracle database, from database all document flow is observed. The status information from all steps is available from single point.

Eventually, the extract file is protected with organisational seal (that has a legal power) and its existence can be proofed by anybody using Bitcoin blockchain. Thus there is no technical or any other way to alter the final result of registration.

Results of questionnaire: Data Provision from Cadastre and Land Registry Databases

Matúš Fojtl (Geodesy, Cartography and Cadastre Authority of the Slovak Republic)

Main impulse for creating this questionnaire was continuing demand for cadastral and land registry data in our society. Nowadays, the citizens expect the data to be accessible through electronic services in a transparent manner, but they also expect that public services will guarantee the full protection of personal data. Therefore, we wanted to find out how other cadastral and land registry institutions have been approaching the issue of data provision. We wanted to know what kind of data you provide, what the limitations are and compare it with our own approach to the issue. We got answers from 25 countries.

1a. In connection with the G8 Open Data Charter do you provide cadastral and land registry data to anyone?



1b. If yes, is it possible for the one who obtains the data to modify and subsequently redistribute or resell these data without any limitations to third parties? 76% disagree with this notion. Evidently we don't like our data to be modified and then redistributed without any limitations.

1c. If yes, does the seller/distributor need to obtain consent of the persons concerned (property owners or other entitled persons)? From those who allow the modification and redistribution only 12% require the consent of persons concerned.

2a. Do you think that the provision of information on individual person's properties *located within the whole territory of your country* should be regulated by EU legislation? 80% of the authorities answered no. From the answers it's quite obvious that we don't want the EU to regulate our internal legislation on this matter.

2b. In your country is the information on individual person's properties *located within the whole territory of the country* provided only to the owner and to state administrative and judiciary authorities for carrying out their legal tasks? By this question we meant that if only the owner and state institutions can have access to such information. 62% of the institutions provide this information also to other persons.

2c. If not, is it provided freely to anyone? From those who provide this information also to other people, only 33% provide it freely to anyone. The rest have set some restrictions on these data.

3a. According to your national legislation, can private IT companies buy in *bulk personal data* on individuals (property owners and other entitled persons) from the cadastre and/or land registry authorities? The emphasis was placed on bulk and personal data. Only in 23% of countries it is possible for private IT companies to buy such data.

3b. If yes, are there any limitations in place when buying personal data? 86% answered yes. The main restrictions are based on personal data protection acts. In each country there are different acts that regulate provision of personal data. For example in Slovakia we provide personal data such as name, date of birth or address. But what is out completely of question is provision of personal ID number.

3c. If yes to question 3a) do they need to obtain consent of the persons concerned (property owners or other entitled persons) if they want to sell the data to third parties? Here was a total conformity – no one needs to obtain consent of the persons concerned.

4a. If a property owner has a mortgage, do you provide this information? 79% of organisations provide this information.

4b. If yes, does the information say who provided the relevant mortgage? 90% of those who provide the information on mortgage also give the info on who provided the mortgage.

5a. In your country, is *all* cadastral and land registry data publicly available without any limitation? The emphasis was placed on the word all. 27% of the organisations provide all data without any limitations.

5b. If not, provision of what data is limited, and how? The majority indicated that provision of personal data is the most sensitive issue. There are different regulations on personal data protection in every country. These regulations decide what data may or may not be provided. In some countries personal data can be provided only to registered owners and state administration. Or the applicants must prove legitimate interest and identify themselves before getting the data. Also, in many countries the applicants must pay a fee for obtaining the data. Some countries don't provide contracts where for example the property price or personal ID number is mentioned. In some countries the mortgage information is not supplied, it only can be verified. Some institutions don't provide bulk data or approve further modification of data.

To summarize it:

It is clear from the survey that the cadastral and land registry data is not provided without some limitation to everybody. In most cases, it is necessary to protect a specific group of data, such as personal data. Countries have also agreed that the area of data provision on person's properties should not be centrally regulated by the EU. It is also obvious that the national legislation in most countries enables the provision of cadastral and land registry data, but with some limitations. Especially, we are quite sensitive on the possibility of additional modifications or further unrestricted sale of these data to third parties.

Session of PCC – Role of CLR in the Interaction with Partners

ALKIS – the new standard for real estate cadastre in Germany

Björn Degel (Working Committee of the Surveying Authorities of the Laender of the Federal Republic of Germany (AdV), Working group real estate cadastre (AK LK))

Opposite to land registry, in Germany cadastre lies within the competences of the German Laender. In order to keep uniformity throughout Germany, the AdV recommends standards on cadastre, state survey and topographic mapping. Considering outdated technical concepts, different modeling concepts, data definition, data formats and implementations the AdV developed the *AAA-Model* based on OGC, ISO and UML-standards. *AAA* stands for *AFIS* (Authoritative Control Point Information System), *ALKIS* (Authoritative Real Estate Cadastre Information System) and *ATKIS* (Authoritative Topographic-Cartographic Information System). *AAA* is documented in the *GeoInfoDoc*. The standard data exchange format is XML-NAS.



Figure 9: AAA in 2015, 3 pillars, each including reference data and technical data, AdV Bericht AG Harm AA, 2015.

At the end of 2015, AAA had been established in all Laender. ALKIS core data are cadastral parcels, buildings, public-law-restrictions, appraisal of soil, and actual use as a mix of land coverage and land use. Owner information as ALKIS core data is a copy of land registry. To retain a constant data ex-

change between cadastre and land registry, the ALKIS data has to be re-migrated to old exchange formats. Up to now, the land registry database is not more than an auxiliary file. Legally binding however, is the written entry in the land registry. In 2020 we are expecting the Datenbankgrundbuch (DaBaG) to launch. It consists of legally binding database-entries. Then, a XML-NAS-based, state of the art data exchange will be established between ALKIS and DaBaG.

Land development agencies regularly redistribute parcels and land holding. To improve their work, they invented the land development technical information system (LEFIS). LEFIS is based on AAA. Data exchange between LEFIS, DaBaG and ALKIS will be done by XML-NAS.

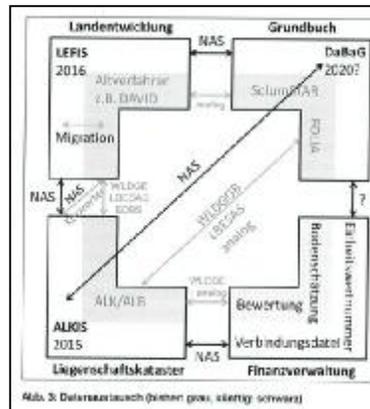


Figure 10: Data exchange (now: gray, future: black), Steudle, Schlegel, fub-Flächenmanagement und Bodenordnung 5/2015.

ALKIS cadastral parcels, buildings, addresses and owners will be used in the population census in 2021. The tax administration is working on an ALKIS-based mass valuation concept for property tax. This mass valuation system requires 3D-buildings as LoD2, which will be ALKIS core data in the updated GeoInfoDoc.

In order to monitor the 30 ha-target, growth of settlement and traffic area is observed using ALKIS actual use as an index on land consumption. To improve this monitoring and to keep the expectations from INSPIRE, ALKIS actual use is about to be split into land coverage and land use. The AdV-concept is supposed to be presented in 2017.

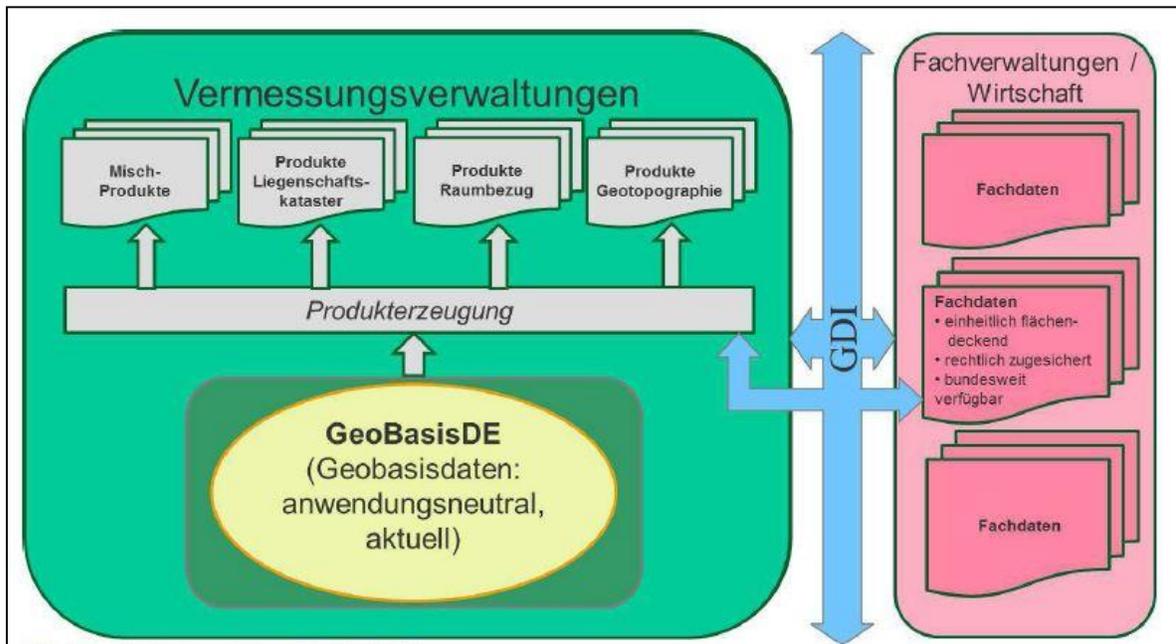


Figure 11: Vision GeoBasisDE, AdV Bericht AG Harm AA, 2015.

The AdV's vision for 2030 is coming from AAA to A. Geospatial reference data will be kept regardless of the use, up to date and redundancy-free. Technical data will be connected via SDI.

Digital first! A smarter planning and building process – the real property register as part of the equation

Magdalena Andersson and Marika Ström (Lantmäteriet, Sweden)

Digital first – assignments

A number of agencies in Sweden recently got the assignment to be “development agencies”. Their missions are to make it simpler, more transparent and more efficient for individuals and businesses taking part in processes where several authorities and municipalities are involved. The missions are to be reported to the Government in 2018.

The identified areas are:

- Smarter planning and building process to increase building activities
- Smarter environmental information to achieve environmental goals
- Smarter food chain to increase growth
- Simplify for private businesses in the contact with agencies

Lantmäteriet has been assigned the area “Smarter planning and building process”. The assignment is to be carried out in close co-operation together with the following three authorities and organizations:

- The National Board of Housing, Building and Planning
- Swedish Association of Local Authorities and Regions
- County Administrations

The objective is to promote a simpler, more transparent and efficient planning and building process for the benefit of citizens, businesses and other actors in their official contacts to increase the building of dwellings. Lantmäteriet shall endeavour to put the citizen and the business at the centre of work and promote open and data-driven innovation. Another aim is also to facilitate contacts between authorities involved.

Expected deliveries

Some of the expected deliveries from the project are to:

- Identify national and international examples in the area of development
- Actively work for single interfaces, specifications and standards for digital co-operation between authorities, municipalities and other interested parties who holds or needs information
- Identify and actively work for co-operation with identified interested parties
- Highlight legal, financial and organizational prerequisites and report about where is a necessity for changes
- By facilitating digital exchange of information create prerequisites in order to promote the development of digital solutions

Planning and building process

As one of the starting points of the assignment a simplified common view of the present planning and building process has been drawn; see Figure 12 below.

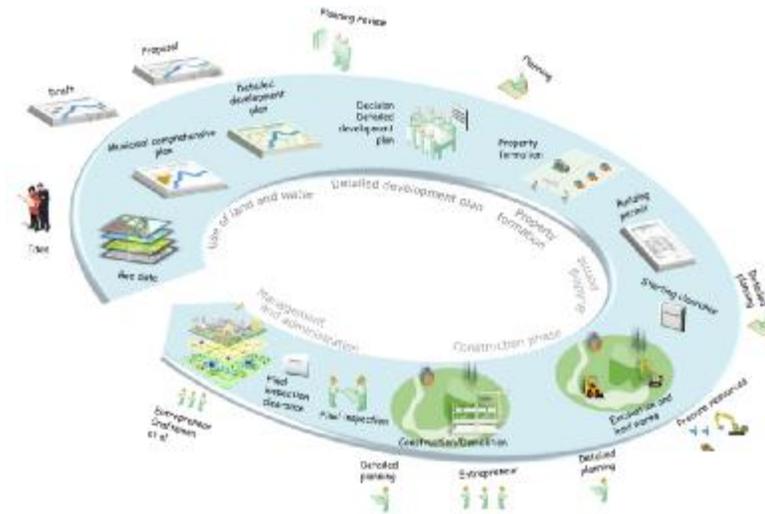


Figure 12: Common view of planning and building process.

The real property register as part of the equation

During the whole cycle of the planning and building process the real property register has an important role to fill and could e.g. be shown in the “centre” of the process view. Information from the real property information is needed throughout the activities, and is also being updated.

In order to facilitate a smarter planning and building process there are a number of areas in relation to the real property register that can be highlighted; e.g. legal development, information quality, cooperation with authorities and dialogue. Activities are on-going in all of these fields and can thus facilitate “Digital first!”.

A new Strategy for Geodata has also been adapted in Sweden. The strategy can be accessed in English via the following link:

https://www.geodata.se/globalassets/dokument/strategi/national_geodata_strategy_2016-2020.pdf

The “back office” of the Spanish cadastre that makes possible the interaction with Partners

Amalia Velasco Martín-Varés (Directorate General for Cadastre, Spain)

The Spanish Cadastre is principally a fiscal cadastre. Its databases of cadastral values of rural and urban real estate are the basis for the calculation of real estate tax and other local, regional and national taxes.

The real estate tax is the main income for municipalities.

The success or failure of the valuation of the real estate and therefore of real estate taxation depends of DATA. Therefore the cadastral database has all the information that it is required for the valuation of each taxable objects that can be the entire property (whether a land parcel, building, or both together) or only the property occupied by a single taxpayer (a flat).

The Spanish General Directorate for Cadastre is responsible of creation, maintenance and diffusion of the cadastral data either directly or in collaboration with local authorities and other public entities.

All owners, notaries and registrars and the public administrations that work in the territory are obliged by law to submit information on the changes in the real estate in the Cadastre.

The strategy consists of gathering other Public Administrations, as well as other organizations, sharing useful information for all of them. They are all considered as providers and beneficiaries: they help us to maintain our data base updated, they acquire all necessary data for their goals. They submit information on the changes in the real estate in the Cadastre with the technical conditions defined by the cadastre that verifies that the graphical information is correct.

Data is electronically provided by collaborators: they can even process the information working directly in our system or sending data through the E-Office.

We had to change our model of business: From a direct processing to management and control. And from a corporate system to a system available to all collaborators.

Therefore we had to define: the new services, the collaboration scenarios and the identity management of internal users and collaborators.

Currently with only 2,300 employers (internal users) we have 68,768 external users and 3,069 users with direct access to applications of cadastre. Therefore the importance of setting: How the collaborators are going to access to data and services; Who (how to control the "good" use); When they are going to access and Which tools are they going to use.

The modifications that are realized on the property elements are carried out across "Administrative records", with a number, cadastral reference, and administrative record type. Each type of administrative record has different processing. The "administrative records" have different "stages of procedure" that can be done by persons with a certain role and each stage has a footprint of the person that have done it.

The information system contains then: huge amount of data and also detailed information about the processing of administrative records, and the incorporated and generated documentation.

In this way for the maintenance of the information we have:

- Compulsory declarations from titleholders (more than 2,000,000 a year). That can be directly update in our offices or by internet or update by the collaborating administrations

- Communications of
 - Notaries and land registers;
 - Tax department (Persons data);
 - Municipalities (Giving authorization for new constructions, extensions, reforms, re-organizations of properties etc.);
 - Other Administrations (expropriations, land consolidation, other actuaciones...). (Communications release citizens from the obligation to declare, breaking down bureaucratic steps)
- Inspection Works and other proceedings done by DGC
- General works, with the assistance of private firms, under technical specifications

To be able to process the information updated by the collaborators we have defined a copy of cadastral data named External Cadastre; we have also define proceedings, declarations models for each physical, juridical or economic variation and powerful tools as:

- SIGECA (Cadastral management): Integrated Management of ALL the procedures for updating the Cadastre.
- SIGCA (cadastral Graphic System): Maintenance of the graphical information (cartography, FXCC, images). With many tools as on-line edition, georeference, interoperability with other information, etc.
- SAUCE (Cadastral maintenance):Assistant to maintain the cadastral information, Validation and valuation
- SEDE (electronic office). www.sedecatastro.gob.es. with more than 53 M of visits in 2015, more than 6.5 M of certificates and more than 1 million maps a day .

Exchange information with collaborators. With regular standardized XML Files; Direct Connection to our cadastral applications served from the desktop Cadastral applications (SIGCA, SIGECA, SAUCE); or Web services.

In the presentation we compared how we work internally (A), with external users (B) or with exchange files (C).

From 2015 we have also a new coordination process with notaries and Land Registries that have improve the tools in our back-office: The cadastral certification, obtained by the title holders and collaborators, include attached a GML INSPIRE cadastral parcel. The certificate is used by citizens to describe the parcel in notaries and land registry.

The cadastral certification is an electronic document (PDF format). It is electronically signed using a Secure Verification Code (CSV). With this code on the document it is possible to access the digital file in the Electronic Office of Cadastre. In this way Citizens can be sure that the image on the document reflects the true coordinates. And Applications of notaries and registrars use a web service to access the content of the GML attached file using the code CSV.

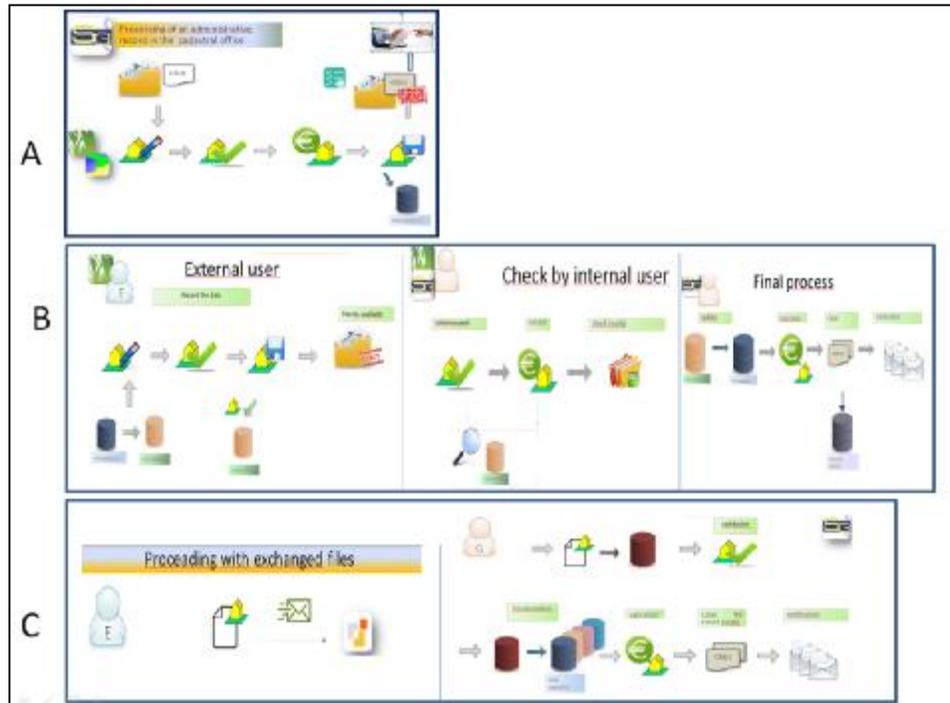


Figure 13: Exchange of information with collaborators.

If there is an alteration or disagreement, citizens can provide an alternative geo-referenced representation. This geo-referenced representation is used to update the cadastre if it passes the appropriate graphical and technical validations. The technicians, the notaries, the registrars need to ensure that the new parcels fit in the continuous cadastral index map. It's necessary to validate it.

The tools for validation deliver a report signed with a secure verification code, that says if is accepted and contain a GML attached to the PDF. The report avoids the physical exchange of files, shows the new representation and enables the automated capture of its contents preventing transcription errors. All the exchange of information with Notaries and Land Registrars is made then through web services

To conclude, I have tried to show you some of the processes, protocols and tools that allow the Spanish Cadastre to work collaboratively and to maintain the database that is needed to assess the values that are the base of various taxes on property and mainly the recurrent real estate tax that is the main income of municipalities in Spain.

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