

Modelling of Land Privatisation Process in Belarus

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Key words: Land privatisation process, the Republic of Belarus, modelling, Unified Modelling Language (UML), class and activity diagrams, the core cadastral domain model.

SUMMARY

Land privatisation is at the moment regarded as the main tool for land distribution in Belarus. Obviously, the process has to function smoothly and effortlessly from the user's point of view. The paper addresses the land privatisation process in Belarus with aim to identify its drawbacks and pitfalls. It therefore assumes that land privatisation is overcomplicated as well as time-consuming and not adapted to the user's needs process. Hence, there is an urgent need for simplification and, thereby, making the property market active and efficiently functioning.

The paper moreover analyses modelling of privatisation process and mostly the developed models with application to further formalisation of the core cadastral domain model. In particular, two types of modelling, namely static and dynamic, or process modelling, are employed in the paper and two respective models in UML notion are used as basis for this analysis. It also raises a question about initial harmonisation of the main cadastral processes by applying the land privatisation process in Belarus as a testing example.

The paper employs 'Literate Modelling' approach when the diagrams alternate with explanatory text.

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1. INTRODUCTION

Cadastral and land registration are internationally recognised as spatial and legal/administrative components of an integrated system whose aim, among others, is to ensure sustainable development. Such integrated system is identified by different names such as, for example, land administration system (Williamson and Ting 2001), system of land registration (Zevenbergen 2002), cadastral system (Bogaerts and Zevenbergen 2001, Silva and Stubkjaer 2002), and cadastre (Navratil and Frank 2004). This paper in turn applies the term 'cadastral domain' to cover the whole area of cadastre and land registration. Development in the cadastral domain is directly influenced by global drivers such as sustainable development, globalisation, economic reform, and technological reform (Ting and Williamson 1999). Globalisation as the result of free market economy requires establishment of international standards within both national jurisdictions and different problem domains including cadastral. At present the main attention of surveying professional organisations and academia is also paid to the process of standardisation (FIG, COST, etc.) and its results of it (Greenway 2002, Lemmen et. al. 2003, Stubkjaer 2003). Unified Modelling Language (UML) is used as a primary tool for this process.

The overall objective of this paper is to address the land privatisation process in Belarus with the aim to identify its drawbacks and pitfalls, i.e. to uncover controversies and to study the deficiencies. The developed static and dynamic models in UML notion are used as basis for the analysis. The complementary objective of the paper is to find out how modelling privatisation process and mostly its developed models could help in further formalisation of the core cadastral domain model.

The paper applies modelling of one specific cadastral process (i.e. privatisation of land) within the legal jurisdiction of one specific country. The models developed here are not final and contain several simplifications and generalisations in comparison with the reality. Model is considered here as 'a simple description of the object' (Cambridge Dictionary 2003) and it is 'nothing more than the way of describing some activity, phenomenon, or problem area' (Rudwick, 1979).

The two developed models (viz. static and dynamic models)¹ shall highlight specific features of privatisation process. Particularly, a static model describes the process through classes, objects, and their relations and how they work (Eriksson et al. 2004), while a dynamic model illustrates the formalised and structured activities performed by different actors as well as the sequence of activities in the course of the process. The process modelling within the cadastral domain is also behind the modelling of core cadastral data. The initial attempts to model property transaction processes (mainly property subdivision and transfer) are being undertaken by the COST Action G9 'Modelling Real Property Transactions' (Stubkjaer

¹ Static and dynamic modelling are described in detail in the section 4

2002). See also presentations within the COST Action G9 framework in Szekesfehervar (Hungary) and Riga (Latvia) for the recent development².

The first assumption of the paper is that the land privatisation process in Belarus is overcomplicated as well as time-consuming and unadapted to the user's needs. It has remained as a relic of the Soviet time. Hence, there is an urgent need for simplification and, thereby, making the property market active and efficiently functioning. There are several activities that may be abolished without any negative consequences in terms of quality, time, cost, etc.

The other assumption is that investigation of a specific case is of great help not only for further development of the presented core cadastral model (Lemmen et al. 2003) but also for movement to initial harmonisation of the main cadastral processes within the EU. Logically, harmonisation of cadastres shall be in line with harmonisation of land registry and property regimes (van der Molen 2002), even if the Treaty Establishing the European Community (1957) leaves the system of property ownership to national governments. Obviously, this will be brought to the agenda of the European community in the future. In support of this statement, the Bologna Process³ can be given as a good example of harmonisation of the educational process on the European arena that is also regulated by national legislations.

Next assumption is that static and dynamic models of cadastral processes are mutually supplemented and both useful for scientific purposes. It is rather incorrectly from scientific point of view to analyse the process without taking into consideration the results both of static and dynamic modelling. Furthermore, standardisation of the cadastral domain is reasonable through standardisation both information sets maintained by different databases and the activities of cadastral processes themselves.

The paper employs 'Literate Modelling' approach when the diagrams alternate with explanatory text.

2. CADASTRAL PROCESSES

Property rights are established, abolished or rearranged by different cadastral processes. Therefore, analysis of these processes will be incomplete without considering the concept of property rights. It is not the goal of the paper to address this concept (for that see, e.g., Demsetz 1967; Alchain and Demsetz 1973; Libecap 1989, etc.). It should only be mentioned here the three modes through which persons can be related to land, namely open access (i.e. none is connected to land), limited access, (i.e. some single rights/obligations are imposed on land), and, finally, complete transfer (ownership right connects a person with land) (Mattsson 2004). The paper omits analysis of the first two connections and concentrates only on discussion of the third one.

Mattsson (1997) distinguishes three forms of property-related change applicable to land held in ownership (Figure 1), namely:

- Transfer of property rights (the most common case is property transfer)
- Property formation measures (e.g., subdivision, amalgamation, etc.)
- Alteration of land use (through planning and environmental regulations).

² <http://costg9.plan.auc.dk/>

³ <http://europa.eu.int/comm/education/policies/educ/bologna/bologna.pdf>

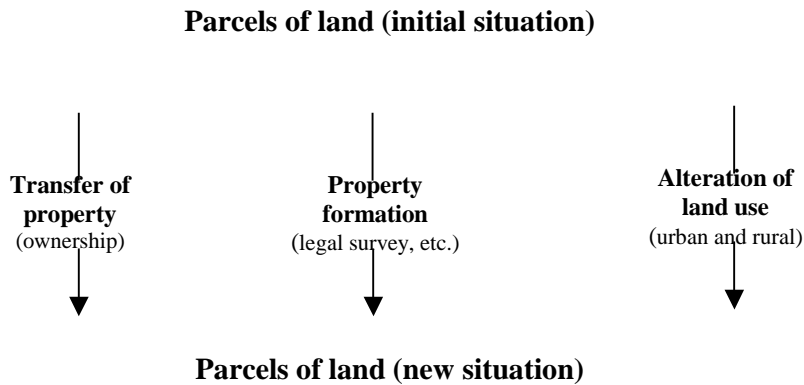


Figure 1 Necessary procedures in land law for change (Mattsson 1997)

This paper regards property formation measures as cadastral processes. Such processes as subdivision, allocation/consolidation, and adjudication are widely considered as the general and important ones within cadastral domain. For example, the comparative work on subdivision in several countries is presented by Zevenbergen (2002). In this paper, land privatisation as a particular case of subdivision is modelled and discussed.

2.1 Land privatisation

Land privatisation is a specific case of subdivision when land in state ownership is transferred into exclusive possession of a private owner or company. The process itself can be separated into a series of activities that are undertaken in order to achieve a result. In our particular case, in Belarus, the result is state owned land transferred to private ownership. So, both transfer and property formation measures are involved. Privatisation, according to the Law of the Republic of Belarus on privatisation of state property (1993) is the process of acquisition of the ownership right on state property by natural or legal persons. The state property can be acquired free of charge or by purchase.

Land privatisation in this paper means transfer of land plot for specifically designated land use. In Belarus private ownership on land is limited by four types of land use (Land Code 1999). It should also be mentioned here that agricultural land is in exceptional state ownership and, thus, privately owned land is mainly used for single family and summer houses (i.e. construction is normally included in the process of acquiring land in private ownership).

Two types of modelling, namely static and dynamic, or process modelling are employed in this paper. To express land privatisation in ontological way, two types of UML diagrams, namely: class and activity diagrams have been developed (Figure 3 and 4).

3. THEORETICAL FRAMEWORK

The developed activity diagram (Figure 4) presents the land privatisation process divided into several general successive activities that in turn consist of actions⁴. Every activity ends with results (e.g., application, map, etc.) that are expressed in documents. Even any intangible result of an activity like, for example, decision about granting land plot is to be documented

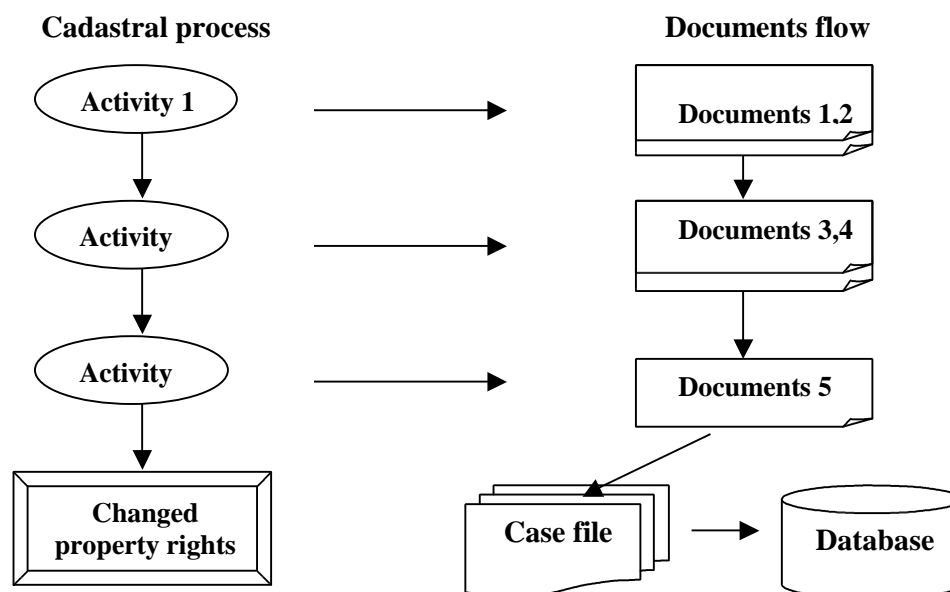


Figure 2 Interrelation between activities within a cadastral process and corresponding documents

(especially in CIS countries due to the historical development). Thus, every activity ends up with one or several documents that exist in the reality and represent the data (compare Navratil and Frank 2004), which has to be stored in the register (i.e. database). Figure 2 graphically illustrates this situation. In application to Belarus it means that in the end of any cadastral process a case file consisting of several documents (e.g., decisions of municipality), cadastral map/plan, etc is to be composed. Then the collected information is converted in digital format and stored in database. Summing up, the results of the process are, among others, the changed property rights on land, information represented in the databases and case files stored in archive.

4. MODELLING

By modelling the cadastral domain is expressed in a formal way. Cadastral modelling is on the agenda at least since the FIG Congress in Washington in 2002 and the subsequent Workshop on Cadastral Data Modelling in Enschede in 2003. Since then the progress is mainly made in modelling of the cadastral domain in the form of UML class diagram.

⁴ Actions as elementary particles of an activity are not discussed in this paper

Generally speaking, modelling is the process of making a model and, therefore, models are the desirable results. Two types of models can, among others, be distinguished, namely: static and dynamic models. Static models describe static characteristics of the system (in our case of the process), while dynamic models describe respectively dynamic ones. Zevenbergen (2004) states that both are useful for describing land registration⁵. Thus, a static model accentuates on the structure of a system and, thereby, information kept, while a dynamic model describes processes that bring changes.

A simplified static model of cadastral system (with some modifications) can be found in Hanssen (1995), Mattsson (2004), Zevenbergen (2004) where a property right connects owner (i.e. subject) with land (object).

In this paper static modelling of land privatisation is regarded as development of a model that describes and structures information (by means of classes and associations) produced during the process. Dynamic modelling of land privatisation implies in turn development of a model that takes the time component into consideration. Therefore, the main focus of this model is not on structure but on the consecution of the process activities and respective changes. The detailed discussion of these two models by the example of land privatisation process follows below.

4.1 Static modelling of land privatisation

This section is aimed at describing static modelling of privatisation process. Following the modern trend of development in the cadastral domain and gradual move of land information service to full cost-recovery (Kaufmann and Steudler 1998), land privatisation can be considered as a business and simultaneously as an open system, as it interacts with the social environment by means of laws, regulations, stakeholders involved, etc. For example, in Belarus an applicant enters a system by applying to municipality and exits it by getting the State Act on land registered by the state cadastral authority⁶ and endorsed by the respective municipality. From another point of view, land privatisation can be described as a ‘black box’ with input and output (Zevenbergen 2004), or with the objective to transform an input into output (Rudwick 1979). Thus, the input, in our case, is the existing tenure situation on land in state ownership and the output is land held in private ownership and prospective positive changes in terms of, e.g., development of property market, efficient land use, etc.

Figure 3 presents the Belarusian privatisation process in UML notion, i.e. UML class diagram that employs classes, objects, and their relationships to describe particular components of the process and how they interact with each other. In particular, the privatisation process begins with submission of application to municipality, namely applicants shall come in person to municipality and fill in the application. It is impossible to begin the whole process just by applying to a surveyor through phone as, e.g., in Denmark. Moreover, application shall be supported by additional documents and calculations (e.g., proof of required land area, etc.). Therefore, it is clearly seen that the privatisation process in Belarus is very formalised, bureaucratically structured and under the strong state control.

⁵ Land registration is equivalent here to cadastral system

⁶ It is single governmental authority performing both cadastral and registration functions

The detailed step-by-step description of the whole process is not a subject matter of this paper. However, it is worthy to emphasise the specific circumstances of the process as well as its advantages and drawbacks as well as particular features of static modelling.

Many associations are omitted from the developed class diagram in order to keep the model as simple as possible and not to overload with details. There are several *drawbacks* in analysing the situation in Belarus with this model and they are stated below.

First of all, it seems to be impossible to present the whole process in detail on class diagram. The process is very extensive and some steps in the process are repeating several times (e.g., application to different organisations). Moreover, if all stakeholders have been included into a diagram, it would be overloaded without reflecting an essential core of the process. To reach this goal, development of several class diagrams mirroring a particular state of the process at specific moment of time is probably needed.

Furthermore, it is obvious that class diagrams are not useful for revealing the time component of the process. This type of diagram is probably useless for identifying the moment when the process starts and when it is complete or when different classes are changed.

Due to clarity of visual presentation, specialisation class 'InterestedParties' is used instead of dividing it into several classes like, e.g., 'Neighbours': 'Natural/NonNaturalPersons', different municipal departments, other authorities (e.g., environmental protection, etc.).

Advantages: class diagrams clearly identify specialisation classes, especially stakeholders and different documents to be prepared and stored in case files. Class diagrams mainly answer in the clear way on two questions, namely: who? (stakeholders) are involved and what? (documents) are prepared. For improvement of the process in Belarus it might be reasonable to propose decrease in a number of documents needed to be prepared and approved. The detailed research in this direction is further needed.

Is it necessary to show on diagram all documents prepared during the whole process? It might be necessary as 'documents provide [this] presentation because they exist in reality and are objects describing cadastral data' (Navratil and Frank 2004).

Concluding, class diagrams seem not to be suitable for describing different property rights and regulations treated in the process. Moreover, they do not emphasise or have difficulties with identifying the moment of change of property rights that is considered as one of the most important result of the whole process. The changes take place at the moment when land is transferred to an applicant who is recognised by the third parties as the rightful owner and, for example, when state ownership is transformed into private one. As it was mentioned above, property rights are an intangible concept, but they are materialised through documents.

The land privatisation process is discussed more in detail in the section 4.2.

4.1.1 Comparison to the core cadastral domain model

The class diagram of land privatisation process can in outline be compared with the core cadastral domain model (Lemmen et al. 2003).

The developed class diagram statically presents dynamic process, while the core cadastral domain model standardises information kept in database (i.e. register). Therefore, different nature of two phenomena can clearly be noticed. Moreover, these two diagrams intersect only

in one point - register (in the case of Belarus it is the Unified register) as land privatisation process produces information (i.e. data) that should afterwards be stored in register.

The core cadastral model identifies and standardises the information (i.e. data) maintained, while the privatisation process model mainly describes documents and stakeholders involved. For correlation between documents and data see Navratil and Frank 2004.

Some more details shall be mentioned, e.g., class 'Fee' depicted on the diagram is not reflected in the core model. Simultaneously class 'RightsOrRegulations' of the core model ought to be divided into two classes, namely 'Rights' and 'Restrictions' (Paasch 2004).

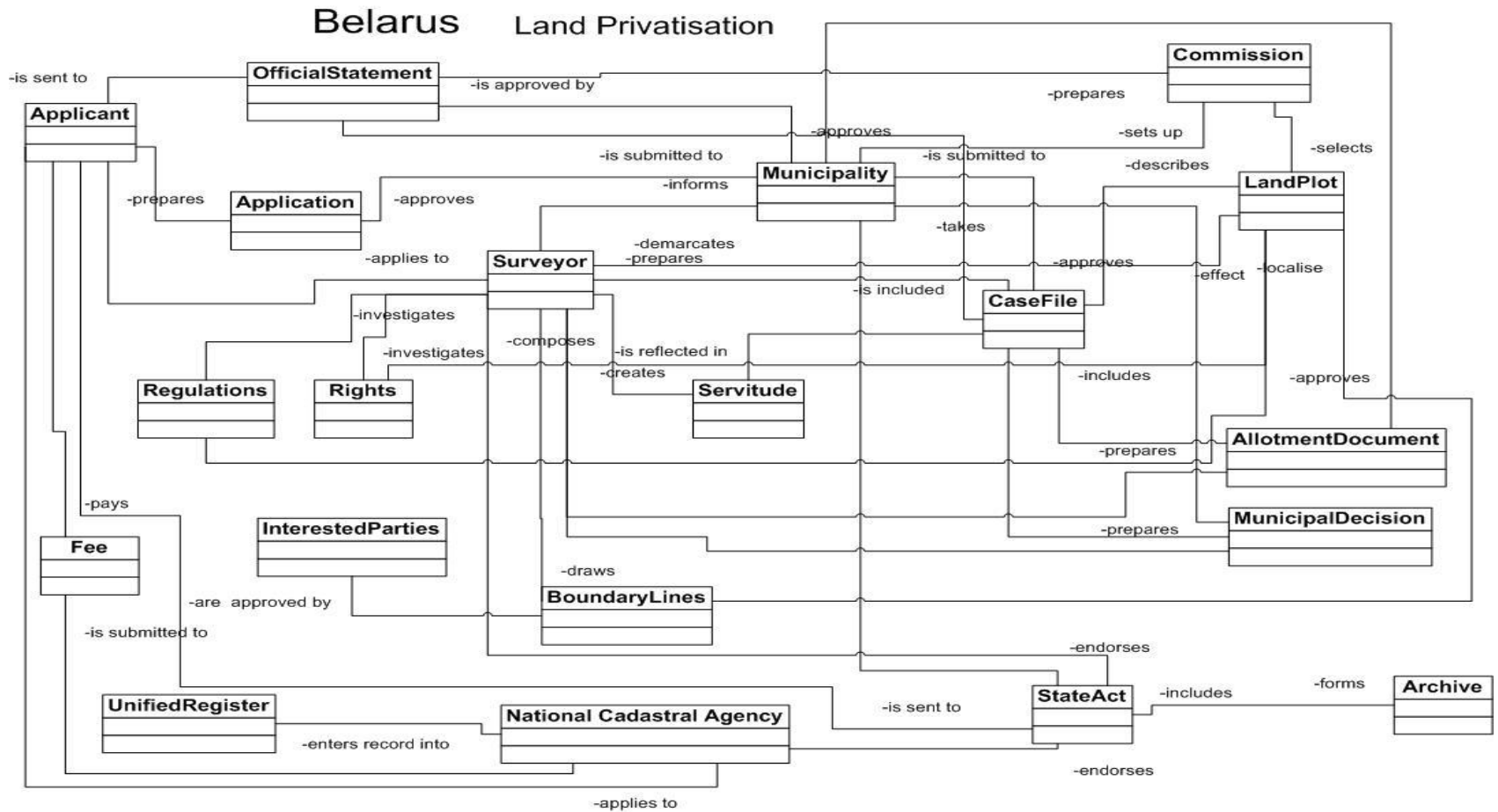


Figure 3 Class diagram of land privatisation process in Belarus

4.2 Dynamic modelling of land privatisation

Formalisation of the privatisation process is done with help of activity diagram in UML notation presented in Figure 4.

As we have discussed, land privatisation is a specific case of subdivision that is regarded as one of the three main functions of the cadastral system (Zevenbergen, 2004). It must be mentioned that the existing activities of land privatisation have been generalised in Figure 4 for better visualisation and understanding of the process.

Activity diagrams are of great help for analysing a sequential flow of activities performed by different stakeholders. So, in our particular case, four main stakeholders are involved in land privatisation such as applicant (i.e. potential owner), surveyor (including surveying organisations and private surveyors), municipality as a governmental body on local level, and cadastral and registration authority that is the single authority in Belarus.

Looking at the diagram, it is easy to understand that municipality plays an important role in the course of the whole process as the same documents return to municipality several times for approvals or decisions. It proves the statement formulated previously that the privatisation process in Belarus is bureaucratically structured and under the strong state control.

To facilitate analysis of land privatisation, the process has been divided into three phases, namely: the land policy control, preparation, and registration phases, where each of them is aimed at accomplishing a specific goal. For example, the goal of the registration phase is to guarantee security of tenure. The main activities for each phase are also identified. This is the very beginning of another type of standardisation within the cadastral domain, namely: standardisation of processes. Generally speaking, the process is divided into several general phases that may exist in different countries. The problem is to clearly identify phases and then to name the activities, which are to be correctly understood outside the national jurisdictions. It in turn helps to compare them with similar ones in different countries. For the complete overview in this direction, see Ferlan, Mattsson and Sumrada (forthcoming).

A two-year gap between the land policy control and the preparation phases may be applicable in Belarus. It means that during this period the applicant has to prepare an architectural plan of the building. If the time limit is exceeded, the applicant shall restart the whole procedure from the very beginning.

According to the described process, the applicant has to apply to different organisations several times. First, to initiate the process, secondly, for development of a case file including the following data: area of granted land plot, soil data, value of land (for compensation purpose, if applicable), type of land use including arrangement of property rights. The third application is to municipality for taking decision about granting a land plot, while the fourth is to the cadastral authority for cadastral and ownership registration. It is remarkable, that in the course of the process several approvals and decisions are taken by both municipality and the cadastral authority but only two possibilities to appeal are stated by the legislation in action (i.e., the Land Code 1999 and the Law on state registration of real property 2002), namely: in the very beginning of the process when municipality approves initial application and the second time – during registration. Appeal procedures against other approvals and decisions of municipality are not mentioned by the main legislative Act concerning land privatisation (i.e. the Decree of the President 2002). Therefore, it sounds logically to question the necessity of these two approvals for which appeal procedures are not prescribed by law.

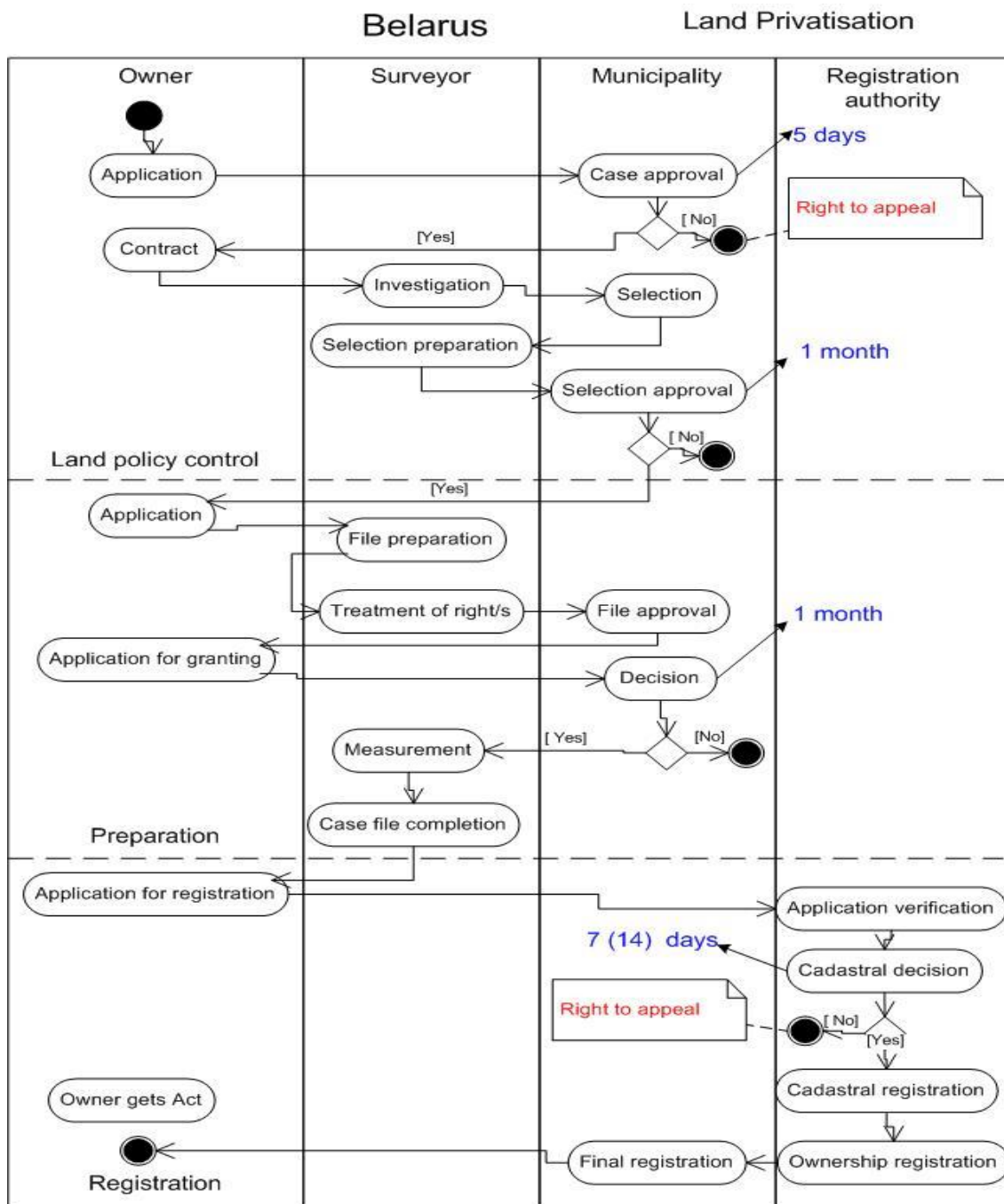


Figure 4 Activity diagram of land privatisation process in Belarus

The technical (i.e. surveying) measurement is undertaken during the last step of the process, just prior registration, when all approvals and decisions are taken and collected by the applicant. Surveyors just perform simple geodetical measurements and demarcate the boundaries in the field. This would be interesting to compare with some Western European countries where technical measurement is normally performed prior of the final decision

about subdivision (e.g. Denmark, Sweden, Finland). It reflects the differences among countries and administrative framework of the society.

Furthermore, the diagram also depicts the prescribed time limits for taking decisions or approvals by municipality (the Decree of the President 2002) or by the cadastral authority (the Law on state registration of real property 2002). It is seen that they vary from 5 days up to 1 month.

As I see it, process modelling helps, to some extent, to further standardise the core cadastral domain model as it identifies activities, which usually end with the results (i.e. information) that shall be stored in database. Improvement (i.e. betterment) of the process (i.e. decreasing the number of activities and their rearrangement) can be useful for decreasing the amount of data in the database. In other words, the less activities are performed, the less of documents are produced, and therefore, the less data is to be processed, stored, and maintained. But of course, all changes shall be reasonable and well-founded. Thus, static and process modelling supplement each other and can be considered as interrelated. And, therefore, process modelling shall also be taken into consideration during the discussion of the core cadastral domain model.

5. CONCLUSIONS

Formalisation of the particular cadastral process with help of Unified Modelling Language provides the strong basis for analysis. A lot of questions based on this analysis can be formulated. But is it possible to answer them with help of UML diagrams? For example, can approvals be abolished without any negative consequences for the process? Or what is legal power of approvals if appeal procedures are not prescribed?

The accomplished analysis lets us conclude that land privatisation in Belarus is an overcomplicated process including many iterative activities. These activities can probably be skipped without decreasing quality of the whole process, as it is difficult to see any functions of them. It is, therefore, soundly to propose abolishment of some activities for the process simplification. It is desirable to re-organise the process as simple as possible, with reasonable number of activities, to make it less time-consuming and less costly. This is vital for further development of property market, increasing the efficiency of land use, as it is widely recognised that land in private ownership is used more efficient than land in state ownership. But the possibility of oversimplification of the process must be kept in mind as not to endanger the legitimacy of public society (Mattsson 2003).

Modelling of land privatisation helps to reveal weaknesses and shortcomings of the process and, thereby, to convince decision-makers in necessity of its revision and redesigning. Moreover, the government in the country ought to be willing to implement comprehensive changes of relevant policies. The developed models are illustrative examples for convincing government to introduce changes and overcome well-known 'resistance to change'. It does not mean that government will accept the recommended changes but it starts at least thinking about it.

UML modelling can be regarded as a tool providing solution for improvement of organisation of land information service and, thereby, reducing costs and increasing profitability. UML is a useful tool not only for technical specialists but also for surveyors and legal experts to analyse cadastral processes for their further improvement and revision.

To choose 'the right' diagram for analysis, researcher should clearly realise the final goal of research. Class diagrams better identify classes and their relationships, while activity diagrams are useful for visual presentation of succession of the activities and their logical framework. The interrelations between two types of developed diagrams are not sharply identified in the paper. It must also be noted that none of two diagrams emphasises the moment of change of property rights, i.e. the moment of transformation from one legal situation to another. Certainly, to discover it, other methods shall be applied or the used method shall be revised. The developed models of land privatisation are, however, both useful for scientific purposes.

The models enrich and deepen the ongoing discussion about further formalisation of the core cadastral domain model and simultaneously raise a question about initial harmonisation of the main cadastral processes by applying the land privatisation process in Belarus as a testing example.

The paper also states the possible future research issues whether it is possible to standardise the main cadastral processes or to distinguish any general components within a process that are present in many countries? Is it realistic to develop the core model of main cadastral processes?

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BIOGRAPHICAL NOTES

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