

Modelling Cadastral Transactions in Greece Using UML

Apostolos ARVANITIS and Eleni HAMILOU, Greece

Key words: Cadastre, cadastral transaction, UML, property transfer, property rights

SUMMARY

This paper focuses on the creation of a Greek cadastral transaction model, using the graphical modelling language UML. The UML diagram for cadastral transactions is the activity diagram, which belongs to the functional model of UML. The activity diagram is used to describe activities or workflows in a system, such as the activities that take place in order for the cadastral transaction to be realized. In other words, through the activity diagram the way in which the cadastral objects interact is presented. The cadastral objects are the property rights, the actors of the transaction (active or passive), the land property and the legal documents.

The cadastral transaction that is being analyzed and presented in this paper is the transfer of the property. By using the appropriate UML symbolisms the output model will accomplish the presentation of the procedure of property transfer, from the time that one provokes the selected transaction until its completion. Additionally, within the model, the person or the actor of every single action is presented, as well as the actions that are of high interest for the Cadastre or the actions, which comprise the external procedure of a cadastral transaction.

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1. INTRODUCTION

The contemporary tendencies for globalization have inevitably influenced the field of Cadastre and especially the cadastral changes. The transactions that are carried out between different countries, gain continuously more territory, bringing simultaneously in the limelight the problems that spring from the particularities of Register Systems and the legal acts of each country. For these reasons, it is of high importance the need for modelling the cadastral transactions. The tool that is used in order to face the communication problems and the information exchange problems between the different cadastral systems is the Unified Modelling Language (UML). UML is principle graphical language in the designing of mainly object – oriented applications, offering at the same time the possibility of visualization and documentation of flow charts, of database processes within an organization, as well as the planning of systems requirements.

The UML graphical modelling language constitutes the best way of ontological modelling, because it provides a rich and a widespread known vocabulary of communication and standardized graphical representations, that offers to the users of distributed information the possibility to search the solutions between the ontology and the capability to express those restrictions that cannot be easily represented by using the descriptive logic.

The diagram that is being selected in order to model the cadastral changes and particularly the process of property transfer is the activity diagram of the functional model of UML language. The activity diagram uses the same symbology with the dynamic diagram of UML and it represents the activities that are realized and the operations that should have been executed within a system.

2. CADASTRAL TRANSACTIONS IN GREECE

Cadastral transaction is every change that occurs in the content of Cadastral Objects. Taking into consideration that Cadastral Objects are the cadastral diagram, the cadastral tables, the cadastral book and other files of titles, diagrams or documents, then, the term of cadastral transaction can be more generalized and it can be identified with every law, spatial or administrative act.

In Greece, the basic legislative regulations that determine the relation between the persons and the land are included in the Civil Code. This institutional frame is accepted and followed at the procedures of the compilation of the Hellenic Cadastre. Moreover, it should also be mentioned, that the Cadastre has not been compiled yet, therefore, the Old System of Transcriptions and Mortgages is still valid. This simultaneous existence of two Register Systems at the future constitutes an additional reason for modelling all the changes that take place.

The legal cadastral changes are identified with the real act, which is registered in the current Register System. The real act concerns the creation, the transfer or the abolition of real property. The legal processes are executed by the lawyers, the notaries and the courts and contribute in the configuration and stabilization of property rights on the land parcels. On the other hand, the administrative cadastral changes do not alter the land parcel and the property rights of the beneficiaries and are carried out by Public institutions and Organizations.

The spatial changes execute by the private surveyor engineers and the engineers who work in the public institutions. Both of them are responsible for the implementation of the land alteration. All the spatial processes that alter the land parcels and the rights of the beneficiaries, record in the cadastral database or in the books of Transcriptions and Mortgages System, depending on the current Registry System. A spatial change can induce:

- The alteration of spatial element, that means the alteration of the form, the place, the boundaries or the area of the property. A representative spatial change that effects an alteration on the spatial element is the widening of a road.
- The elimination of spatial element. This elimination has as result either the creation of new spatial elements, or not. In first case characteristic example of spatial change is the amalgamation while in second case an example is the demolition of a building.
- The creation of spatial element, as it happens in the case of building a house.

Most of the times a cadastral transaction is triggered by the owner of the real property, who can be a Natural or a Legal Person. Changes that are triggered by the State are those that concern the massive property or property right alteration. Moreover, administrative changes are also triggered by the State. For these changes a publication of an administrative decision is required in order to begin the relative processes.

When the current Register System is the Cadastre, every administrative, spatial or legal act is recorded, without taking into consideration the kind of the transaction. After the completion of a cadastral transaction, in order for the cadastral database to be informed the participants of the alteration should declare the changes to the appropriate Cadastral Office. In case of administrative change, the State is responsible for the declaration of the changes to the appropriate Cadastral Office.

2.1 Modelling cadastral transactions using UML

The participants of a cadastral transaction depend on the kind of transaction. In general, the participants can be the beneficiaries of the land, who can be either Natural or Legal Persons, the surveyor who usually implements the cadastral changes, various public organizations, services or institutions, the notary, who is essential for the legal consolidation of new rights, and of course the employees of the Cadastral Office or the Transcriptions and Mortgages System, who will record the change at the database. These employees are considered to be part of the Public administration. Each one of these persons has concrete responsibility, which is presented in the activity diagram by the symbol of activities. Additionally, these persons are represented within the activity diagram by using the tool of swimlane (figure 1). Consequently, the responsibilities that should be done in order for a cadastral transaction to be completed share the same number of swimlanes with the number of the characters that participate in the change.



Figure 1: Swimlanes of the activity diagram

The duties that should be realized within a system constitute the activities of the activity diagram, which are placed in the swimlane that corresponds to the character that implements each particular activity. During modelling the cadastral transactions, the problem of choosing one or more possible workflows come to surface. In this case the symbol of decision is used. The decision symbol is also accompanied by a characteristic question that specifies the development of the diagram. The transitions that come from a decision can be two or more and each of them takes place only under particular conditions, which are specified by the transition. The conditions that accompany the transitions must be mutual excluded so that only one will be finally chosen. Moreover, when the symbol of decision is used, there are more than one different versions of continuation of the diagram, so there must be another one symbol similar to that of decision, which is called merge and brings together all the transitions that stems from the previous decision symbol. The merge symbol is also important inside a diagram because it allows the user to follow the activities that are executed in every case of the initial choice of transition.

In figure 2 a generic model of property transfer is depicted. A model that is based on the above - mentioned analysis. At this point, it should also be notified that the activities with yellow color symbolize the exterior process of cadastral transaction, which doesn't interest directly the Cadastre, while the activities that interest directly the Cadastre are represented with green color.

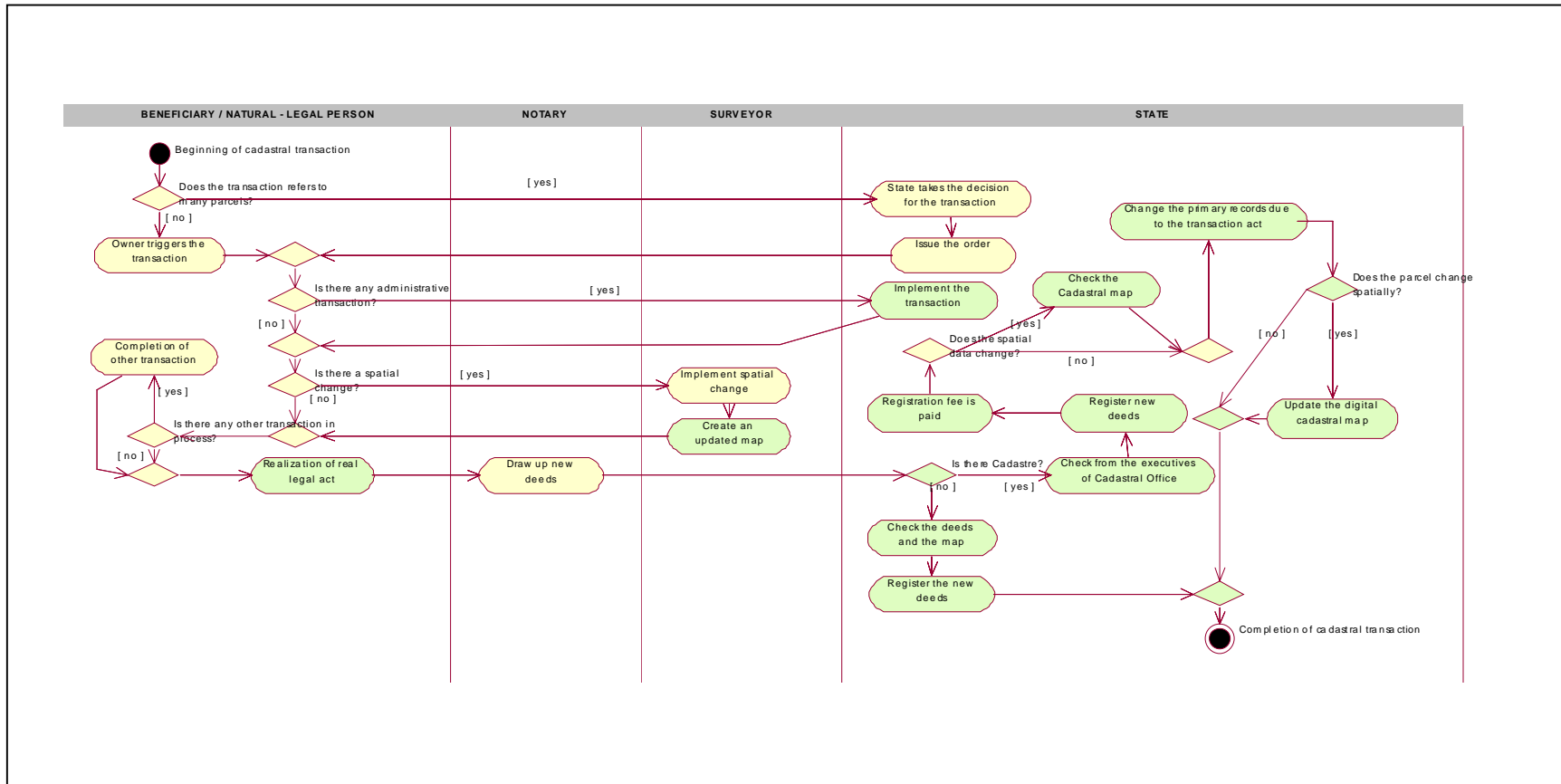


Figure 2: A generic model of cadastral transaction

3. PROPERTY TRANSFER

The property transfer constitutes a cadastral transaction that implies the real act. It usually happens between two persons due to an agreement. It is also possible, the individual seller to address to either a Real Estate agency or to an intercessor, or finally to newspaper notices in order to come in contact with the candidate buyer.

In Greece, in order for a transfer to take place there should be two lawyers, one representing the buyer and the other representing the seller. The obligation of the buyer lawyer is the control of the under sale property's title of real estate. This control includes checking owner's property rights, regarding the last twenty years. Moreover, the potential of existence of any encumbrance such as the mortgage, the seizure or the requisition from any other Natural or Legal Person or the State is investigated. In the case where the land parcel has been devolved to the possession of householder from heritage, the relative documents are checked. These above mentioned controls usually also made by the notary. After that, the notary calculates the fiscal value of the real estate and the deed, which is drawn up by the notary, is finally signed. Then, the buyer pays off the dues to government and deposits the statement of tax transfer to the Inland Revenue in order for the tax transfer to be paid. If the buyer is a first time owner, he pays diminished transaction costs.

After the sign of the deed, it is up to the notary or to the new owner to record the action to the appropriate land registry, if the current Register System is the Conveyance and Mortgages System. The conveyance of new title lasts about a week. If the Cadastre is compiled, the new owner addresses to the nearest Cadastral Office in order to register the property transaction.

The application form for the new property registration is recorded after the necessary check of property's title. The control takes place into the Cadastral Office and concerns the legality of the title and the relevant documents. Every new registration is accompanied its expenses in favor of the H.E.M.C.O and the State in general. If the former check presents any lack in the prerequisite documents, the new registration gets a temporal character until the owner brings all the appropriate documents. Otherwise, the new registration is being removed from the database.

The property transfer does not involve any spatial descriptive change or any change in the cadastral diagram. On the other hand, it affects the cadastral database and particularly the files that relates with the property rights. The records concerning the initial rights and the initial beneficiaries, are firstly registered in a separate database before their removal from the original database. At these records is also mentioned the date of changes implementation, in order to be maintained the time-priority of action.

3.1 Modelling the property transfer with UML

The main characters of this transaction are: the beneficiaries, the lawyer, the notary and various public organizations, services or institutions. Taking into consideration that within an activity diagram the tool of swimlane represents the responsibilities in a system, the swimlanes that will be created for the property transfer model are: the 'Natural / Legal Person', the 'State' and the 'Notary'. Hence, the diagram is separated into three vertical corridors, where each one represents the responsibilities of the respective character. In other words, the swimlane 'Natural / Legal Person' contains all the activities that are realized by the beneficiaries, who can be natural or legal persons, the swimlane 'State' contains the activities that are realized by public institutions, services and companies including the Cadastral Office, the Transcriptions and Mortgages System and the lawyers who participate in the cadastral transaction process while the swimlane 'Notary' includes all the activities that are worked out by the notary.

The model that is going to be created must start with a beginning state and must end with a termination state. Furthermore, the symbols of decision that are going to be used should be followed from transitions with reciprocally excluded conditions. The diagram that follows (figure 3) represents a typical example of a property transfer model in Greece.

It should also be mentioned that the activities with yellow color symbolize the exterior process of property transfer, which doesn't interest directly the Cadastre, while the activities that interest directly the institution of Cadastre are depicted with green color.

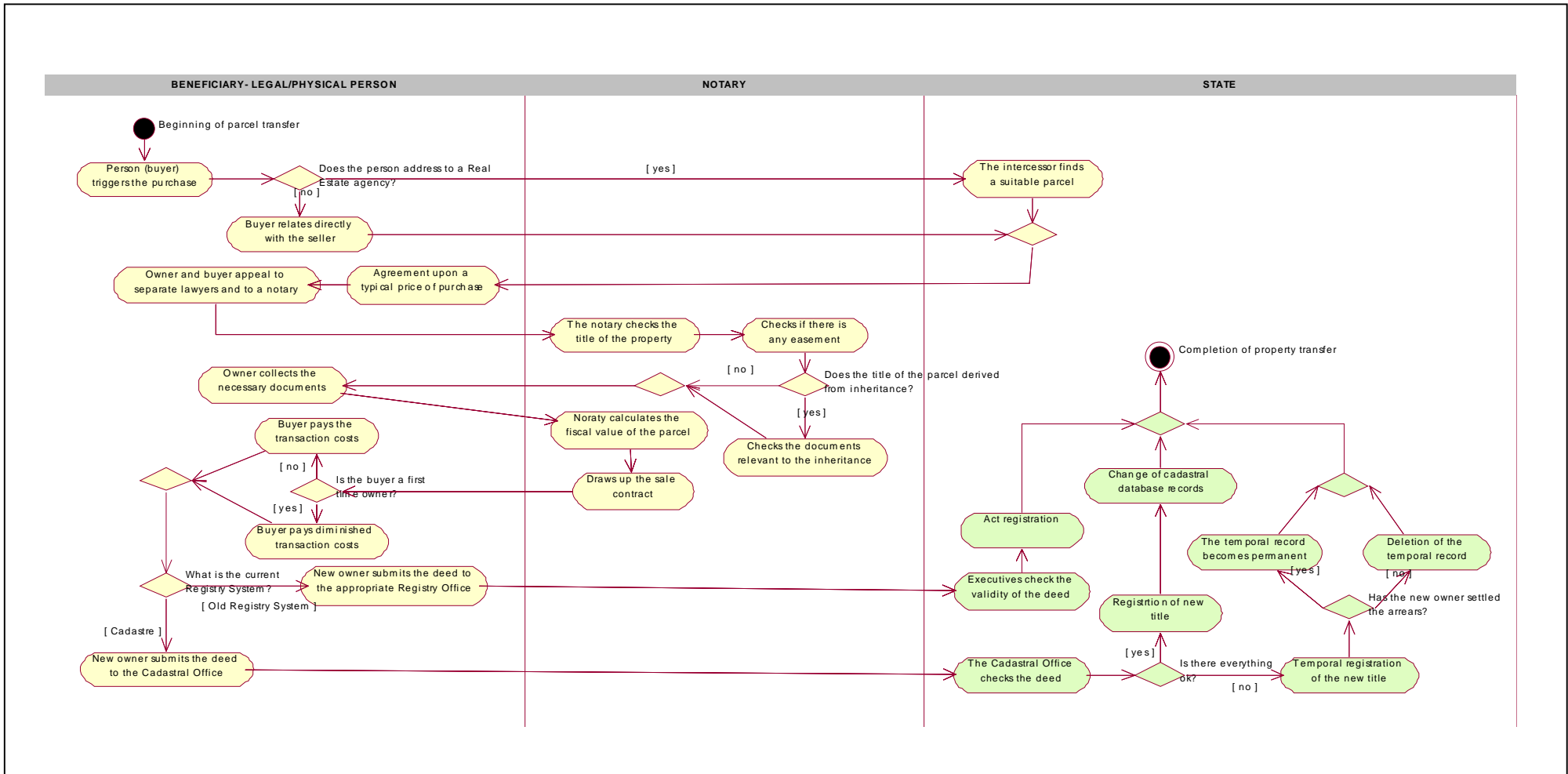


Figure 3: The model of property transfer

4. CONCLUSIONS

Undoubtedly, the modelling of cadastral transactions leads to a better organized cadastral system. First of all, the knowledge of such a model helps the employees of the Cadastral Office, because it simplifies the process of cadastral database update. On the other hand, this kind of model can organize and facilitate the activities that the beneficiaries have to deal with. Moreover, modelling of the cadastral processes can facilitate the work of the rest of the active characters of a cadastral system, which are the notaries, the engineers, the lawyers and the employees of Public institutions and organizations.

Regarding the effects of modelling on international level, the modelling of cadastral transactions with the use of a widespread known graphical language, like UML, entails the successful information exchange and communication between the various cadastral systems. Consequently, the transactions between two countries are simplified, in a way that the actors of the transaction are aware of their responsibilities and their obligations towards the current Registry System of each country.

The most important advantage of the cadastral transaction model is the achievement of comparative analysis between cadastral systems. The model that will be created for each country will constitute a standard of efficiency, faculty and rendering of services. Hence, cadastral benchmarking, and particularly cadastral transaction benchmarking will lead to the improvement of cadastral processes, regarding to the cost of realization and to the processions duration. Moreover, the cadastral transaction model improves the conditions for a safety property possession, as well as for property transfer and recognition of beneficiaries ownership rights. Therefore, the cadastral transaction model will not only give rise to the cadastral benchmarking, but it will also constitute the reason for improvement. Finally, the creation of representative cadastral transactions models for every country, will gradually contribute to the creation of a common worldwide Cadastre.

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BIOGRAPHICAL NOTES

Prof. Apostolos Arvanitis

20 years of teaching and training activities on Cadastre, Land Information Systems, Data Base Modelling, Real Estate Valuation and GIS at the University of Thessaloniki, Greece. Project Coordinator of about 20 Research Projects funded by Greek and EU sources. 2 Dissertations, 1 Scientific Book about Cadastre, Teaching Notes, Research Reports and about 60 scientific publications on the fields of Cadastre, Land Information Systems and Geographic Information Systems, in Scientific Journals and Conventions. Cost G9 Action MC Member. Director of the School of Rural and Surveying Engineering MSc Program.

Hamilou Eleni

Diploma of the Rural and Surveying School of Aristotle University of Thessaloniki MSc Diploma at the specialization of 'Cadastre and Management of Spatial Data' of the Postgraduated Program of Rural and Surveying School of Aristotle University of Thessaloniki. 2 scientific publications.

CONTACTS

Professor Apostolos Arvanitis
Department of Cadastre, Photogrammetry and Cartography
School of Rural and Surveying Engineering
Aristotle University of Thessaloniki
U.B. 439
54124 Thessaloniki Greece
Tel: + 30 2310 996094
e-mail: aparva@eng.auth.gr

Eleni Hamilou
Department of Cadastre, Photogrammetry and Cartography
School of Rural and Surveying Engineering
Aristotle University of Thessaloniki
U.B. 439
54124 Thessaloniki Greece
e-mail: eleni_xamilou@hotmail.com