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FACULTY OF ENGINEERING SCHOOL OF RURAL AND SURVEYING ENGINEERING
DEPARTMENT OF CADASTRE, PHOTOGRAMMETRY AND CARTOGRAPHY

MODELLING CADASTRAL TRANSACTIONS IN GREECE USING UML

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The property transactions that are carried out in different countries are becoming ever more popular, revealing at the same time the problems that spring from the particularities of Register Systems and the legal acts of each country.

Cadastral transactions are embedded in institutional structures that vary across countries.

Therefore, depending the country, there are several differences in the way that transactions are executed.

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For this reason we need a common tool to face the communication problems and the information exchange problems between the different cadastral systems. This tool could be a common modelling language and the most suitable among them is the Unified Modelling Language (UML).

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 is used to describe activities or workflows in a system, such as the activities that take place in order for a cadastral transaction to be done.

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Cadastral Transactions in Greece

What is Cadastral Transaction?



Cadastral Transaction is every real, spatial or administrative act on Cadastral Data.

Cadastral Data contain every cadastral diagram, cadastral table, cadastral book or other file of titles, diagrams or documents.

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The **real cadastral transaction or real act** concerns the creation, the transfer or the abolition of real property and it is executed by the lawyers, the notaries and the courts.

A **spatial act or spatial cadastral change** is executed by the surveyor and it can induce

- The alteration of spatial element, such as the widening of a road
- The elimination of spatial element, such as the amalgamation or
- The creation of spatial element, such as the building of a house

The **administrative act or administrative cadastral change** is carried out by Public institutions and Organizations.

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Usually, a transaction is triggered by the owner of the real property or the State when it is going to be an administrative cadastral transaction.

The participants of a cadastral transaction, depending the kind of transaction, can be the beneficiaries of property, the surveyor, the notary, the Cadastral Office and public organizations, services or institutions.

The tool for their responsibility allocation within the activity diagram of UML is the corridor tool.

BENEFICIARY / NATURAL - LEGAL PERSON	NOTARY	SURVEYOR	STATE
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Form 1: Duty delegation within the activity diagram

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While modelling cadastral transactions there could be a problem of choosing one or more possible workflows. 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. Two or more transitions follow the decision symbol and each of them takes place only under particular conditions. The conditions that accompany the transitions must be mutually excluded so that only one will be finally chosen.

Form 2: Decision symbol accompanied by mutually excluded transitions

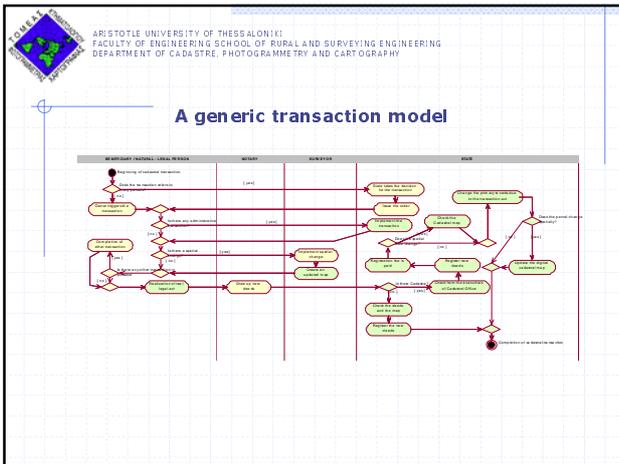
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Every cadastral transaction is completed with the transaction registration at the current Register System.

In Greece, the Cadastre hasn't been compiled yet, so the Old System of Transcriptions and Mortgages is still valid.

In modelling language, when a transaction is completed the symbol of termination state is used. Within an activity diagram there can be more than one termination states, but only one beginning state is permitted.

Form 3: Termination state

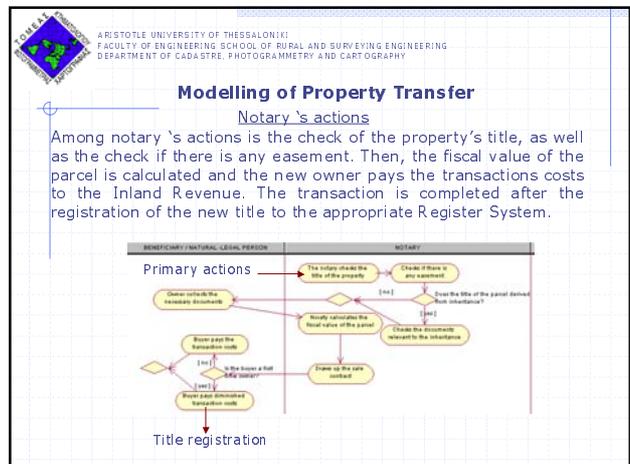
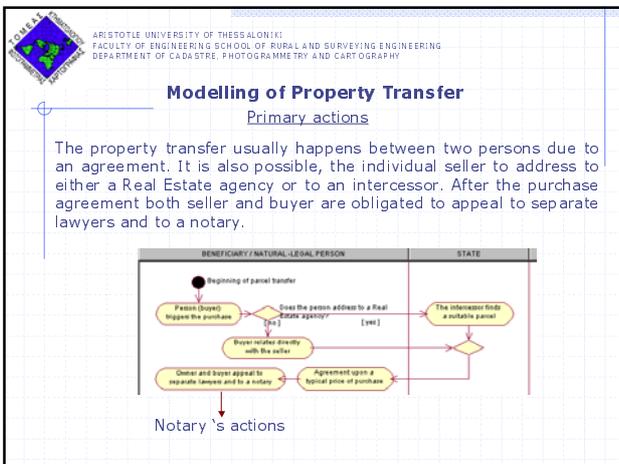


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Modelling of Property Transfer

Primary actions of modelling:

- Find out the characters of the transaction 'Natural / Legal Person', the 'State' and the 'Notary'
- Draw a beginning state.



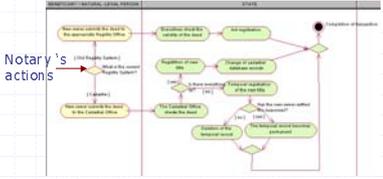
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Modelling of Property Transfer

Title registration

If the current Register System is the System of Transcriptions and Mortgages, the new owner submits the deed to the appropriate land registry and the executives register the act after its meticulous check.

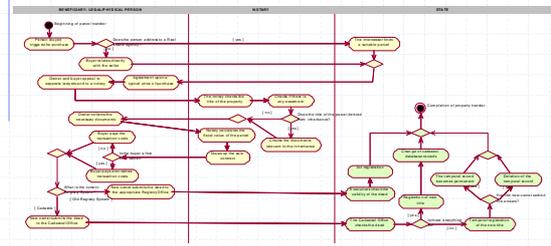
In case that the Cadastre has been compiled, the new owner addresses to the nearest Cadastral Office in order to register the property transaction. The new title is checked for its validity and the cadastral database is changed.



The diagram shows a flow starting from 'Notary's actions' leading to 'Request for registration' and 'Registration of the deed'. It includes decision points for 'Is the deed valid?' and 'Is the deed registered?'.

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Model of Property transfer



This diagram is a more complex UML Activity Diagram showing the interaction between 'Notary', 'Land Registry', and 'Cadastral Office'. It includes various activities like 'Check the deed', 'Register the deed', and 'Update the cadastral database'. A legend at the bottom indicates that yellow boxes represent 'Activities that don't interest directly the Cadastre' and green boxes represent 'Activities that interest the Cadastre'.

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CONCLUSIONS

- First of all, the modelling of cadastral transactions leads to a better organized cadastral system.
- It simplifies the process of cadastral database update.
- It organizes and facilitates the activities that the beneficiaries have to deal with.
- It facilitates 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.

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CONCLUSIONS

- 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.

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CONCLUSIONS

- Last but not least, with the cadastral transaction model a comparative analysis between cadastral systems is achieved. Hence, cadastral benchmarking will lead to the improvement of cadastral processes, regarding to the cost of realization and to the process duration.

This, will improve 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 the improvement of Cadastres worldwide.