

Modelling Cadastral Activities

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Overview

1. Presentation of real property related procedures (Denmark)
2. Steps to model UML-classes from procedure (activity) descriptions

1. Danish Property-related Procedures

1. An overview
2. Establishing a new easement
3. Subdivision

<u>1.1 Procedures related to Real Property - Danish terms</u>	
<p>Cadastral procedures</p> <ul style="list-style-type: none"> • Subdivision (creation of new unit from one or more) • Amalgamation (two or more units into one) • Lot-transfer (transfer of lot between two existing units) • Boundary adjudication • Primary adjudication (Creation of new unit by extending coverage of cadastral map) • - (Separation of share in jointly owned unit) • Cadastral recording of expropriation • Cadastral recording of statutory land consolidation • Boundary settlement (Quasi-judicial boundary determination) 	<p>Matrikulært arbejde</p> <ul style="list-style-type: none"> • Udstykning • Sammenlægning • Arealoverførsel • Ejendomsberigtigelse • Matrikulering • Fraskillelse af fælleslod • Berigtigelse af ekspropriationskendelse • Berigtigelse af jordfordelingskendelse • Skelforretning
<p>Quasi-cadastral procedures</p> <ul style="list-style-type: none"> • Preparation of condominium register (a micro-cadastre) • Preparation of map for deed of servitude 	<p>Identifikation og stedfæstelse af geografiske objekter</p> <ul style="list-style-type: none"> • Opdeling i ejerlejligheder • Udarbejdelse af rids til servitutdeklarationer
<p>Transfer of real property rights</p> <ul style="list-style-type: none"> • Sale of a unit of real property • Inheritance • Forclosure auction, Compulsory sale • Expropriation, forced sales • Mortgaging • Leasing • Granting of servitude/ Establishing an easement 	<p>Overdragelse af rettigheder i fast ejendom</p> <ul style="list-style-type: none"> • Salg af en fast ejendom • Arv • Tvangsauktion • Ekspropriation • Pantsætning • Udleje, forpagtning • Stiftelse af servitut
<p>Title and boundary disputes</p>	<p>Retssager om adkomst og grænser</p>
<p>Spatial planning restrictions</p> <ul style="list-style-type: none"> • Statutorily imposed restrictions • Restrictions due to specific planning measures 	<p>Ejendomsretlig regulering ved arealplanlægning</p> <ul style="list-style-type: none"> • Generel regulering • Konkret regulering ved lokalplan mv
<p>Taxation of real property</p>	<p>Ejendomsbeskatning</p>

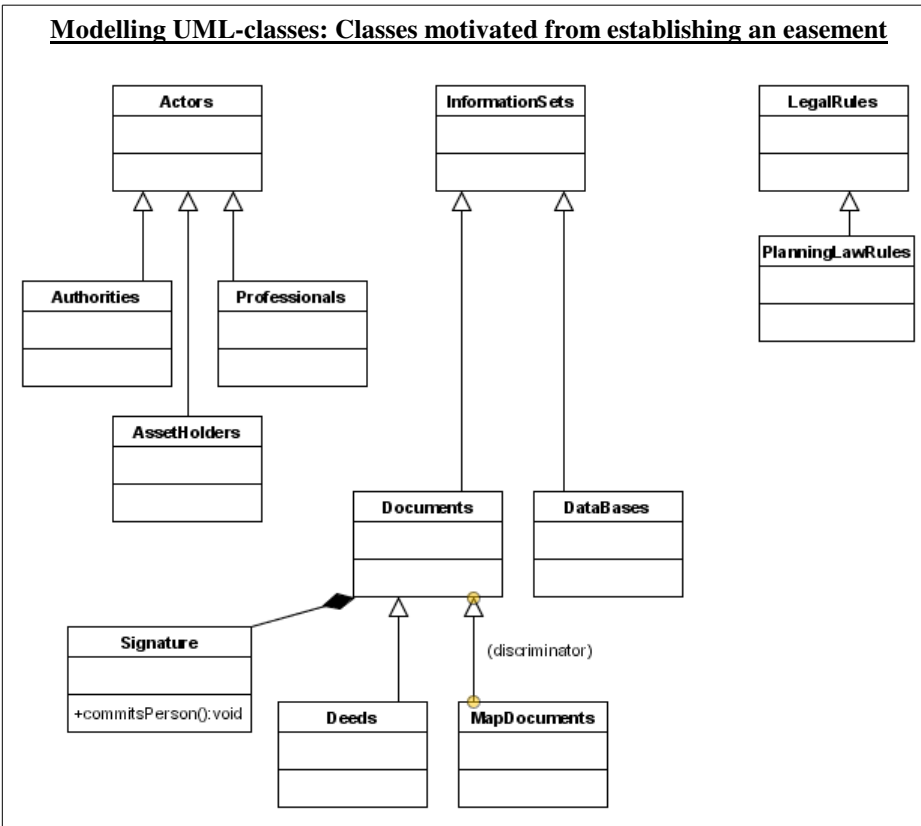
<u>1.2 Founding an easement - The Danish case</u>	
Activity	The owner grants an easement
Context	Applying for building permit; land development
Actors (legal competencies)	Primary: Owner, LandSurveyor, Lawyer, LandRegistry Secondary: Beneficiary, Municipality
Trigger	Owner's advisor or potential beneficiary points to the need of establishing an easement
Sub-activities	<ol style="list-style-type: none"> 1. Advisor or potential beneficiary establishes the need of an easement and gets the owner's consent to pursue 2. Advisor collects the needed documentation (information sets) and drafts the easement deed 3. Geodetic surveyor prepares the map to be annexed 4. The owner signs the easement deed 5. The deed is submitted to the municipality for notification according to planning law 6. The fee for the recording of the deed is paid 7. LandRegistry checks, records and notifies the deed, keeps copy and returns the notified original to advisor 8. The notified easement deed is given to the beneficiary 9. The honorary of the advisor(s) is payed by the requesting party
Variations	Depending on the context, the geodetic surveor prepares both easement deed and map
Parallel processes	-

<u>1.3 Subdivision - The Danish case</u>	
Activity	Subdivision recorded in cadastral system
Context	Owner sells a parcel of his unit of real estate, e.g. to allow for building construction on the parcel
Actors (legal competencies)	Active: Cadastral surveyor, owner, cadastral authority Passive: Holders of rights in the unit, municipality, other local authorities, land registry
Trigger	Owner requests the service of the cadastral surveyor
Sub-activities	<ol style="list-style-type: none"> 1. Request accepted 2. Data collected retrieved and assessed 3. Strategy for specific case chosen, based on information sets 2, 5, and 6 4. Boundaries set in the field, measured and documented 5. Property rights that interferes with the subdivision acknowledged/ settled/ restated 6. Case approved by municipality and other local authorities, with respect to spatial planning, etc. 7. Case approved by cadastral authority 8. Cadastral surveyor, land registry, and municipality informed of the approval Cadastral authority sends subdivision certificate to actors 9. Statement on allocation of easements among to new and old parcels completed and sent to land registry 10. Fee to cadastral surveyor paid 11. Documents (cadastral map of parcel) delivered to the owner
Variations	<ol style="list-style-type: none"> 3. Purchase deed may be registered as an encumbrance at the outset of the case 3. Mortgagors (5.) may present heavy claims as precondition for relaxation of parcel of their collateral 4. If grant of approval (6.) is dubious, field work may be postponed until approval is granted
Parallel processes	8. Municipality updates Property Register (ESR) and, if applicable, Building and Dwelling Register (BBR)
Model adopted from: Alistair Cockburn: 'Basic Use Case Template' http://members.aol.com/acockburn/papers/uctempla.htm (Oct. 26. 1998)	

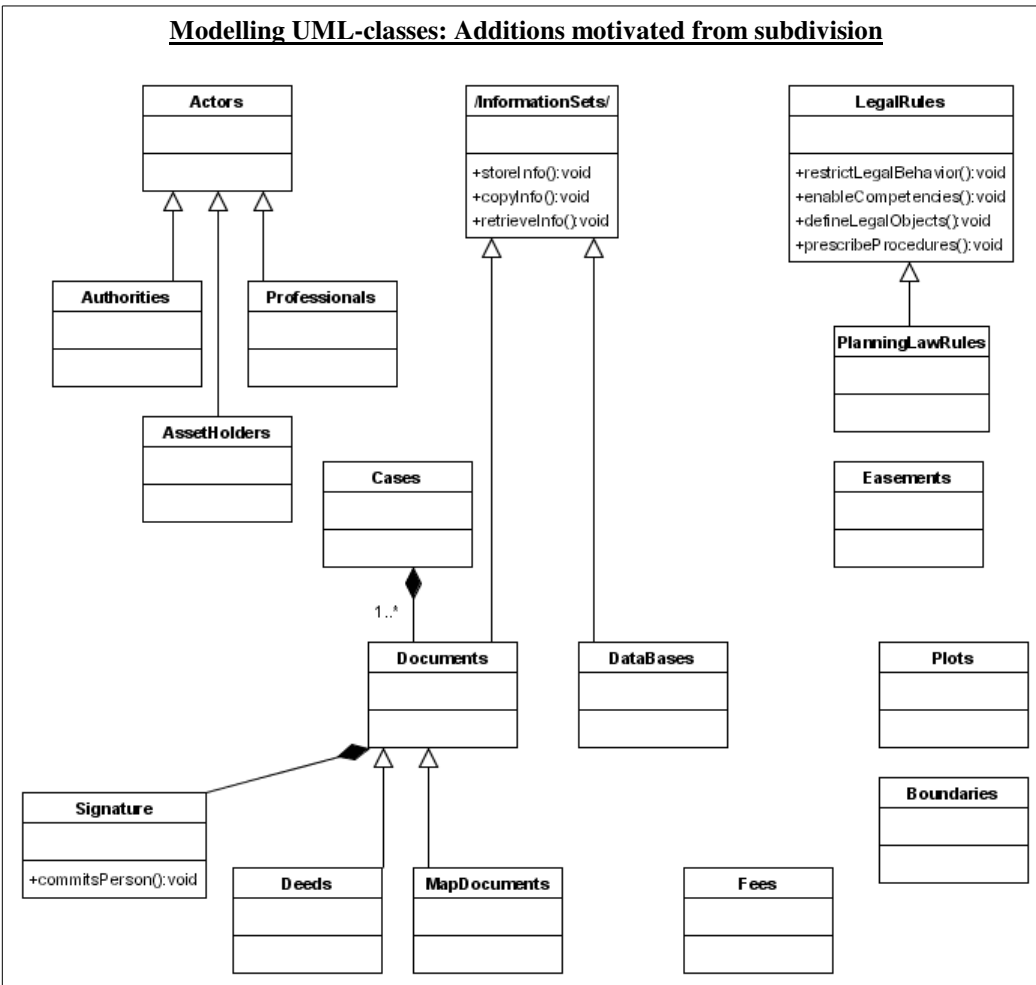
2. Modelling UML-classes from activity descriptions

1. Procedure for, e.g. right of way, cf. 1.2 above
2. Looking for nouns = Candidates for classes
3. Considering class relations -> Cadastral classes motivated by founding an easement
4. Process for subdivision, cf 1.3 above: Rephrasing descriptions
5. Adding more classes, relations and 'operations'

Modelling UML-classes: Classes motivated from establishing an easement



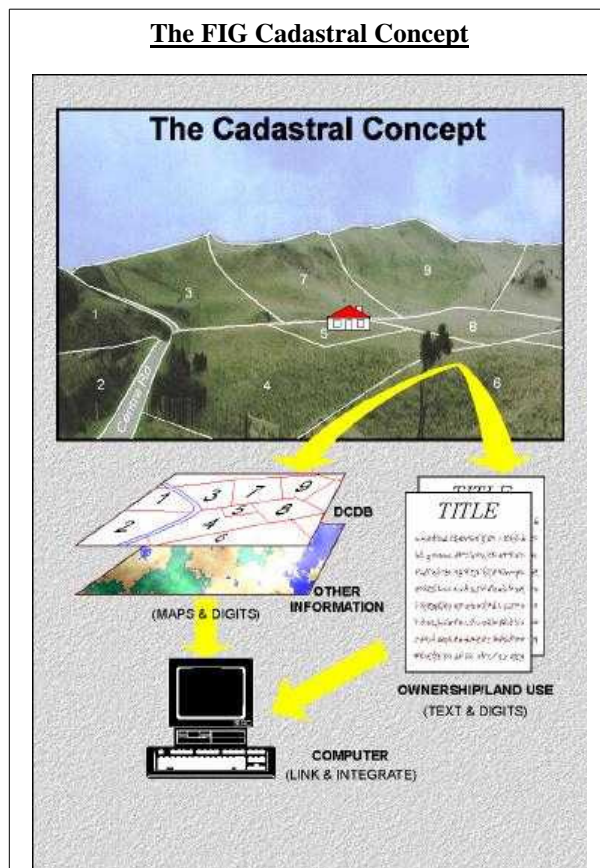
Modelling UML-classes: Additions motivated from subdivision

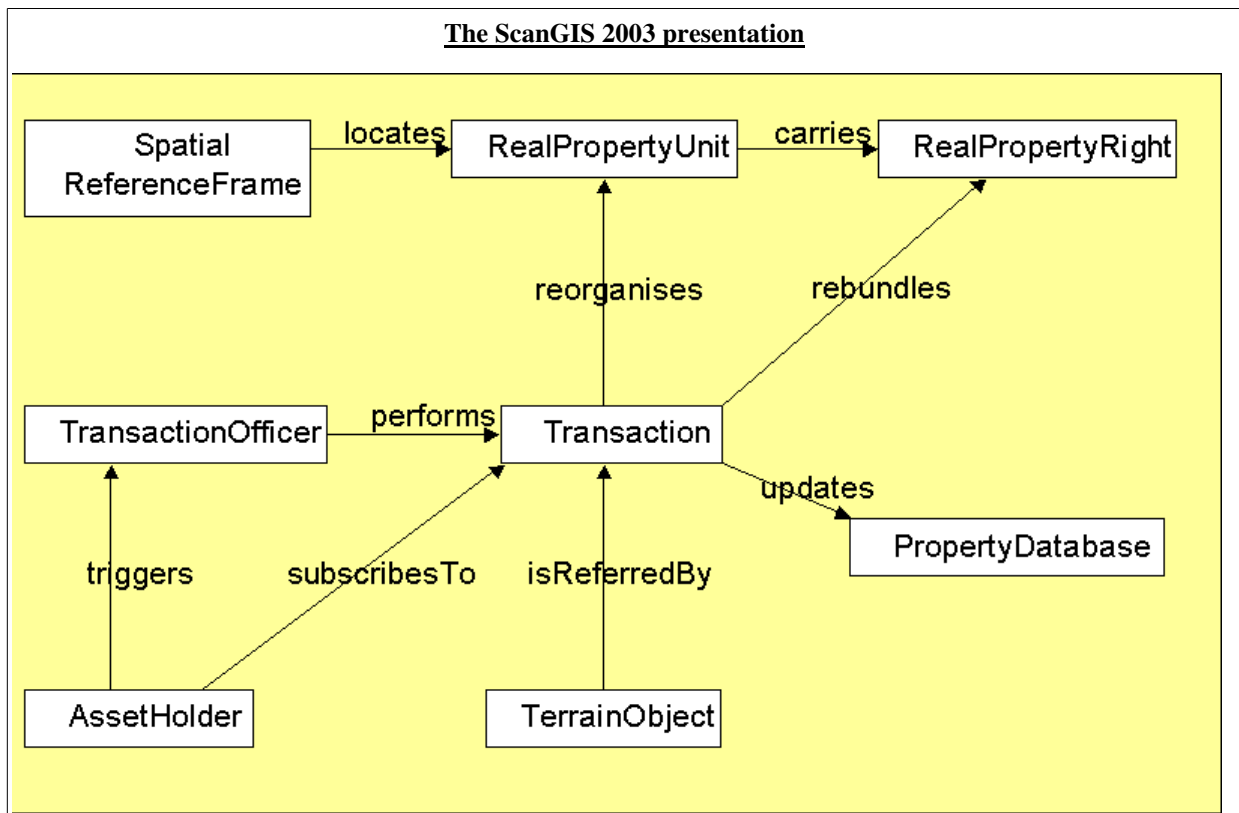
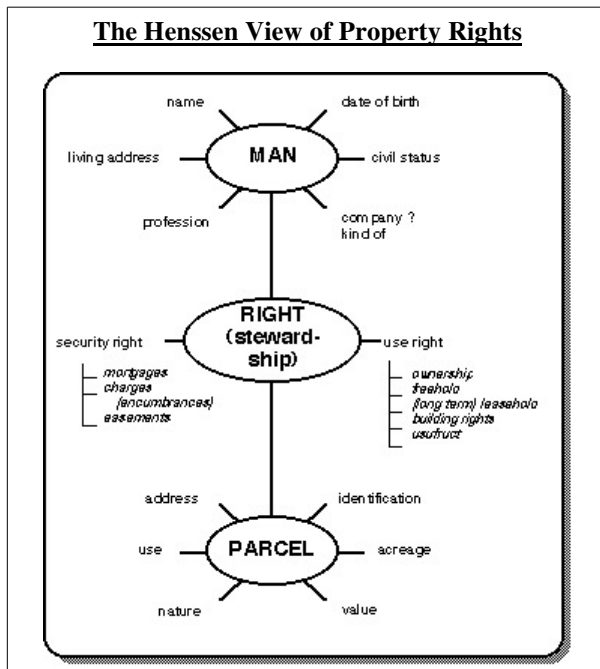


Overview: How do we model?

- We focus on **activities**, not data, not legal rules
- Rights exist because of **activities/ processes/ transactions**
not because of rules
- Documents make sense (= right) only in context.
John Searle: X (= Doc) count as Y (= right) in context Z.
- We should model according to existence, not a la Henssen, 1995, but perhaps like Stubkjær, 2003

The FIG Cadastral Concept





From (Cockburn) UseCases to Classes and back

0. A
1. Identify nouns in an activity diagram, and take them as candidates for classes
2. Consider relations among these classes:
Establish class diagrams
3. Rephrase the activity diagram to make it consistent with the class diagram (set)
4. Include more activity diagrams, and iterate from A
5. Include activity diagrams from another country, and iterate from A

Looking for functional commonalities

The functional objectives the subdivision process may be described as to:

- reorganise the rights in the plot and its surroundings according to the wish of the parties,
- without compromising the rights of passive (and active) holders of rights,
- in compliance with spatial, environmental and agricultural legislation, etc, and
- maintaining the clarity and efficiency of registration, by i.a. establishing systematically identified plots of land

Source: Stubkjær, FIG 2002, modified

Test the activities against these functional objectives:

- If objective accomplished: Rephrase that this is made clear (UML formalism?)
- If objective is not accomplished: State in writing

Approaching the summary

- The reality of property rights is accessible only through recording of documents that are embedded in activities
- A method is proposed for the establishment of reality related cadastral classes
- The set of cadastral classes, and the functional objectives, specifies in a formal way the cadastral domain (? nothing left?)

Summary

- Rewriting our use case/ activity diagrams according to the above formal specification is needed to accomplish our G9 main objective: “The main objective of the Action is to improve the transparency of real property markets and to provide a stronger basis for the reduction of costs of real property transactions by preparing a set of models of real property transactions, which is correct, formalised, and complete according to stated criteria, and then assessing the economic efficiency of these transactions” (COST 328/00, 2001)

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