
Cadastré as a Socio-Technical System - View of a domain expert

Including a summary of Ottens & Stubkjær: Conceptual boundaries of real property - A socio-technical analysis of the cadastral system

Abstract

In this note, I try to consolidate inputs from diverse approaches within the COST G9 efforts, namely Ottens' Socio-Technical Systems approach, Hess' Ontology Engineering approach, Vaskovich' UseCase/Activity models, and my own attempt at 'Grasping the overall objectives' of cadastral systems, based on Zevenbergens literature review of such objectives (section 1: Summaries).

The key proposal is to explicate the content of the transaction process in general terms, that is: Not related to the domain of real estate. The main classes/categories are then: AssetHolders *transact* Assets. Furthermore, it is proposed, not to focus the objective issue predominantly on the cadastral system (the focus we tend to use in teaching, etc), but include and prioritize the *transactions*, because this is where the end-user comes in. The cadastral system is an infrastructure, a support system, and so its support should become explicit (section 2: The 'missing link').

1. Summaries

A definition: Cadastral System: Briefly: the cadastre and the land registry of a state taken together. In more specific terms: The organisational units concerned - within a jurisdiction - with identifying units of real property and recording geographical, legal and perhaps (Uf!) economic attributes of these units.

A) Ottens' socio-technical system (that is: The static part)

Actors

Owner (user)
Companies (Professionals: surveyors, lawyers; Financial institutes: Banks, ..; Computing: Software and Services;)
Authorities (Government, judiciary (and police); government officers;)
Schools (Universities etc)
Groups (squatters, social movements)

Social elements

Restructured, to have most palpable at bottom, and most transcendent at top. (The notion of *institution*

ought to come in here)

Formal	Informal
Norms/values (trust)	
Legislation (establishing rights)	Customary 'law'
Standards (of technical nature)	Tacit knowledge
Statutes (of organisations, etc)	
Study programs	Socialization
Sign systems	Symbols
Procedures	Rituals

Technical elements

Satellites
Computers and networks
Coordinate measuring devices
Databases, archives; documents and maps
Markers (boundary, control points, sign posts)

B) Hess-Vaskovich's ontology

The ontology focuses on what H-V call *Activity*, a sub-unit. Rados in the Ashgate book terms the atomic unit: *Action*, which is a subunit of *Activity*.

2.2.3 Basic Concepts and Properties for the Top-Level Ontology

Concepts	Activity, Function, Result
Properties	hasFunction (domain: activity, range: function), resultsIn (domain: activity, range: result)

While keeping the detail of the investigation, it is necessary to link the Function to a hierarchy of such functions, to arrive at the general objectives, which were described by Zevenbergen, Thesis, jfr Stubkjær, Bamberg



Figure 3 - Results from the Examination of a Property

A nice exemplification of a hierarchy of increased specification of asset (Property/Building) attributes.

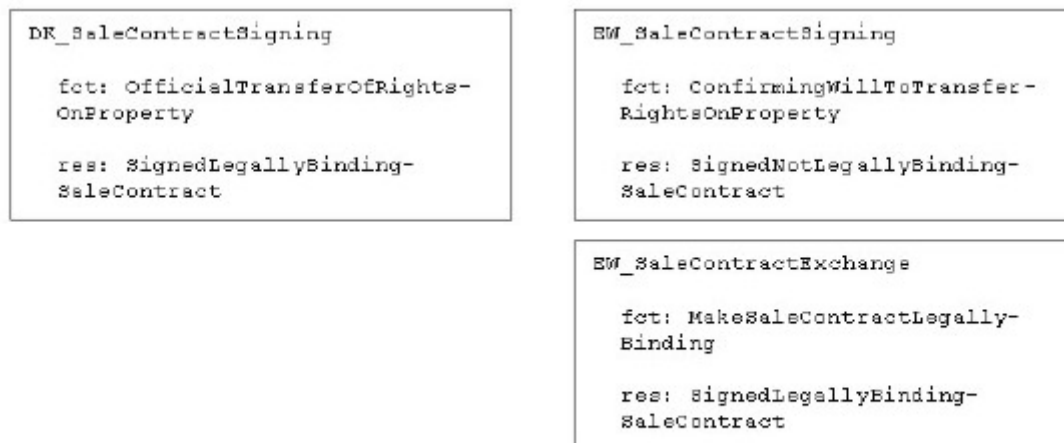
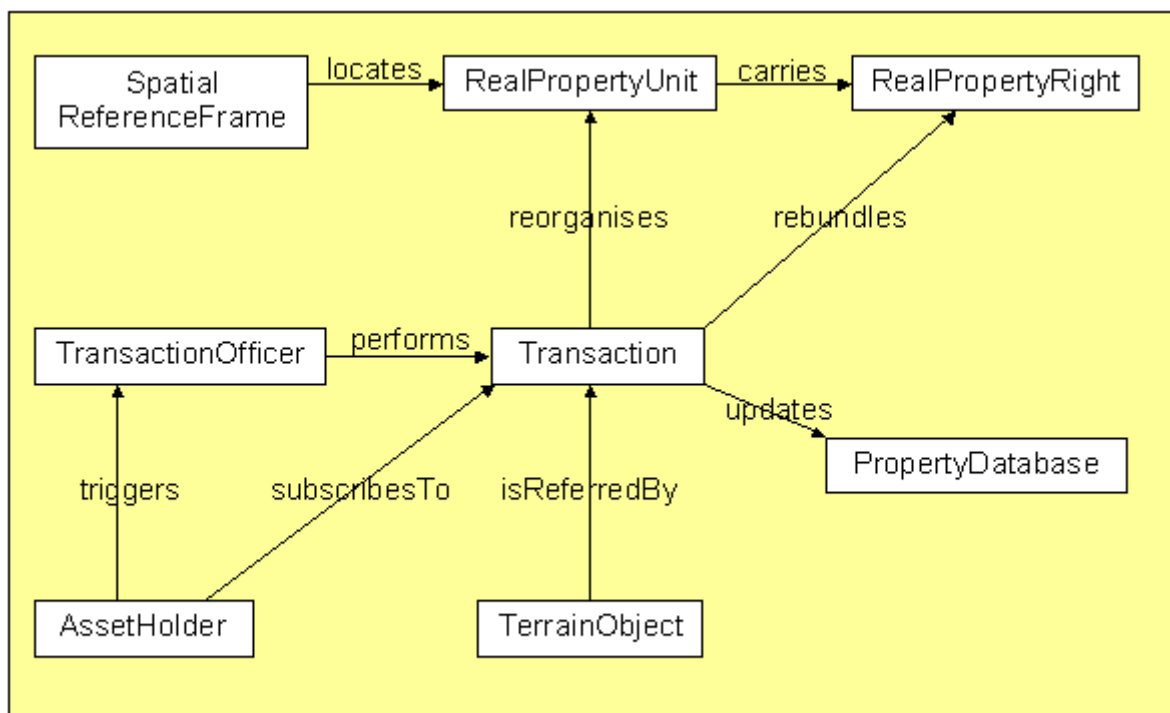


Figure 4 - Proposed Modeling of the Activities describing the Signing of the Sale Contract

An unsolved problem: How to account for that Danish legislation entitles the (not-professional) buyer to step back from an agreement (against penalty)

C.1) Components of a Cadastral System (ESt, ScanGIS, 2003)



Cadastral Core Packages

Legislation and stated professional code of conduct is missing among packages.

The SpatialReferenceFrame could better be generalized into DomainKnowledge, or something like that.

C.2) Grasping objectives (ESt, COST/FIG Bamberg, 2004)

Examples are provided, which illustrate the top-level objectives:

Ruoff (1957) mentions three principles often quoted in literature in English:

- The mirror principle, that the recording in LR accurately and completely mirrors the facts that are material to title,
- The curtain principle, that purchasers, etc. need not investigate legal facts beyond what is

- recorded in the LR, and
- The insurance principle, that a deficient LR recording triggers compensation to those, who suffered a loss by trusting it in good faith.

Concluding, 'legal security', 'public credibility', and, proposed by Zevenbergen: 'trustworthiness' seems best to capture the overall objective of cadastral systems, while the 'mirror principle' with the 'insurance principle' best explains why credibility is achieved.

Even more general, the Copenhagen Accession Criteria, 1993, refer to

- The legal system, including the regulation of property rights, is in place; laws and contracts can be enforced

2. The 'missing link'

AssetHolders *transact* Assets

AssetHolder *marketAttributes* of Asset

AssetHolder *investigatesAttributes* of Asset

(AssetHolder *assessesValueOfAttributes* of Asset)

AssetHolder *investigatesPower* of TransactionPartner (Is s/he entitled, otherwise able, and willing to dispose as expected?)

TransactionParteners *settle* ConditionalitiesOfTransaction

TransactionParteners *exchange* Assets

Perhaps, an ontology has been established already on such level, e.g. related to research in contract law. However, many deviations from general contract law may exist in the real estate domain.

Rather than considering the Cadastral System as the main scope, it should rather be *transactions* or *contracting*, which determines to overall (end-user rooted) frame. The cadastral system then find its place as a support, an infrastructure for the contracting behavior.

2.1 A detail:

AssetHolder (= Buyer) *investigatesAttributes* of Asset (= Property Unit)

AssetHolder *investigatesPhysicalAttributes* of Asset (= Terrain Object, cf Hess, figure 3)

AssetHolder *investigatesCadastralAttributes* of Asset (= RealPropertyUnit, with attributes: Boundary, Size, ..)

AssetHolder *investigatesLegalAttributes* of Asset (= RealPropertyRight, with attributes: encumbrance, cf Jesper Paasch, recorded in PropertyDataBase)

AssetHolder *investigatesSocialAttributes* of Asset (not covered by the Cadastral Core Packages: Neighbourhood, incl. crime, servicelevel, recreation)

2.2 Another detail

AssetHolder *investigatesDispositionPower* of TransactionPartner (Is s/he entitled to dispose as expected?)

TransactionPartner is an AssetHolder as well (in specific role).

Such investigation is grossly supported by the Land Registry (= Database; The Cadastral Core Package figure needs a double arrow)

3. Summary

If, in the Cadastral Core Packages the package PropertyDataBase is considered to be in fact the Cadastral System,
and the atomic units of the Hess-Vaskovich ontology are placed into a hierarchy of actions, the top of which is the general transaction of asset,
then it seems that overall statements on e.g. the 'trustworthiness' can be related through such hierarchy to specific actions
and thus we can better explain, why trustworthiness is maintained.

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