

The cadastre as a socio-technical system

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Overview

1. Motivation: Provide a theoretical foundation for cadastral studies
2. Inspiration: The research project *Next Generation Infrastructures*
3. The element and relations of socio-technical systems (M. Ottens)
 - a. Technical elements
 - b. Actors
 - c. Social elements
4. The cadaster as a socio-technical system: Analysis → elements
5. The cadastre ... : Synthesis, based on COST G9 → relations
6. Conclusion: Approach of COST G9 + NGInfra → Theor. foundation

1. Motivation: An explanation of the Cadastre

- i. Overture: The need for explanations, 1974 ff
- ii. Three bumblebee-riddles and their solution
 - a. The identification of flats
 - b. The diffusion of road naming and coding
 - c. The constructive talks, which called Danish BBR (national information system) into being
- iii. The search for other, who need such explanations
- iv. Some engineers now need such explanation:
Infrastructures (e.g.airport) is a 'socio-technical system'



Tentative explanations and the invisible interest in them

1. The cadastre is a geographical information system, Kart og Plan 1999, (but GIS-technology doesn't cover the cadastral essence).
2. Cadastre and Land Registry is an institutional infrastructure, COST G9 2001-05, (but who cares, when the buzzwords are LAS and SDI)
3. Cadastre is a socio-technical system, 2004-?

Who could show interest?

- Cadastral agencies? National scope, yet: EULIS (technology focus)
- The professions? Micro-enterprises, yet: Potential FP7-support
- The university faculties? 'Soft', human influenced engineering → STS

2. Next Generation Infrastructures

A research programme with related
 BSc study programme in *Systems Engineering, Policy Analysis & Management*
 and MSc study programme with
Engineering and Policy Analysis, including

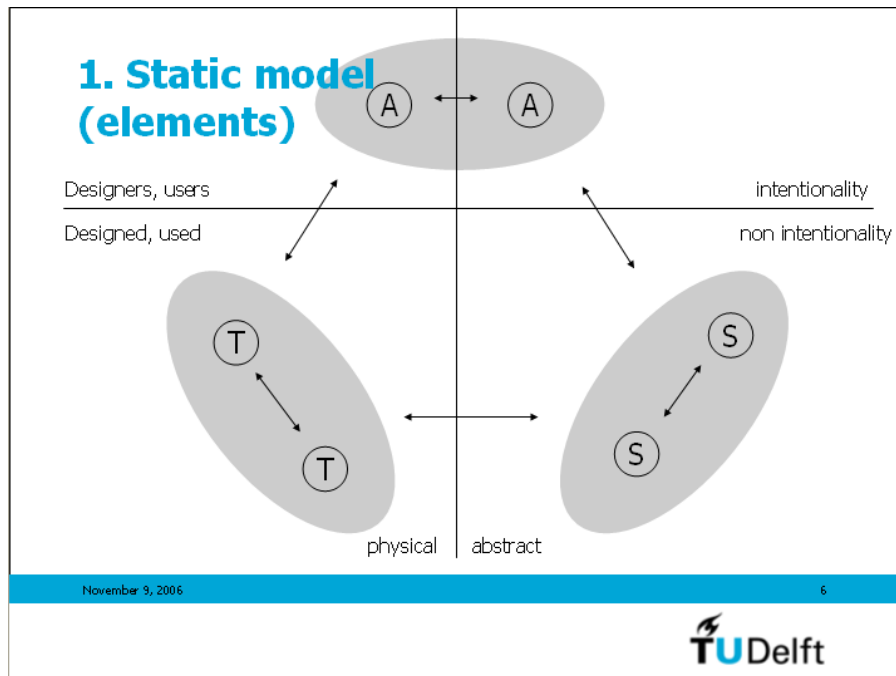
- EPA1111 Introduction to policy analysis 5
- EPA1231 Economics of infrastructures 9
- EPA1421 Inter organisational decision making 9
- EPA1431 Cross-cultural management 6

Textbook: De Jong, Lalenis, Mamadouh (2002):
 The Theory and Practice of Institutional Transplantation

"..donor of [institutional] transplant:

1. Continental Europe
2. United Kingdom and/or the United States"

3. The elements of socio-technical systems (Ottens, 2005)



The relations of socio-technical systems (Ottens, 2005)

1. Static model (relations)

technical-technical	<i>physical</i>	<i>functional</i>		
technical-agent	<i>physical</i>	<i>functional</i>	<i>intentional</i>	
agent-agent	<i>physical</i>	<i>functional</i>	<i>intentional</i>	
agent-social		<i>functional</i>	<i>intentional</i>	<i>normative</i>
social-social		<i>functional</i>		<i>normative</i>
social-technical		<i>functional</i>		<i>normative</i>

Types of relations

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7



4.a Technical elements in Cadastre

- Global positioning and Earth-observation satellites
- Coordinate measuring devices (equipment for surveying and mapping)
- Computers and networks
- Information carriers (hard disks, paper, stones)

The all obey to the laws of nature, e.g. gravity



4.b Actors involved in Cadastre

- Owners and other holders of rights
- Authorities
 - Government, including the judiciary, the police, and fiscal bodies;
 - Municipalities;
 - Civil servants, municipal officers
- Companies
 - Professionals: Lawyers, surveyors,... ;
 - Financial institutions: Banks, .. ;
 - Software vendors and service providers
- Educational and research organisations (Universities, ..)
- Groups (Squatters, social movements)

4.c Social elements of the Cadastre

Formal	Informal
Legislation (establishing rights and obligations)	Social norms/ values (e.g. trust) Customary law
Statutes (of organisations, etc.)	
Standards (of technical nature)	Tacit knowledge
Study programmes	Socialization
Processes prescribed by procedures	Rituals
Databases, archives; Documents and maps Markers (legal boundaries, place names)	(Domain) language

5. Synthesis - A framework by O. Williamson

Williamson: The New Institutional Economics

597

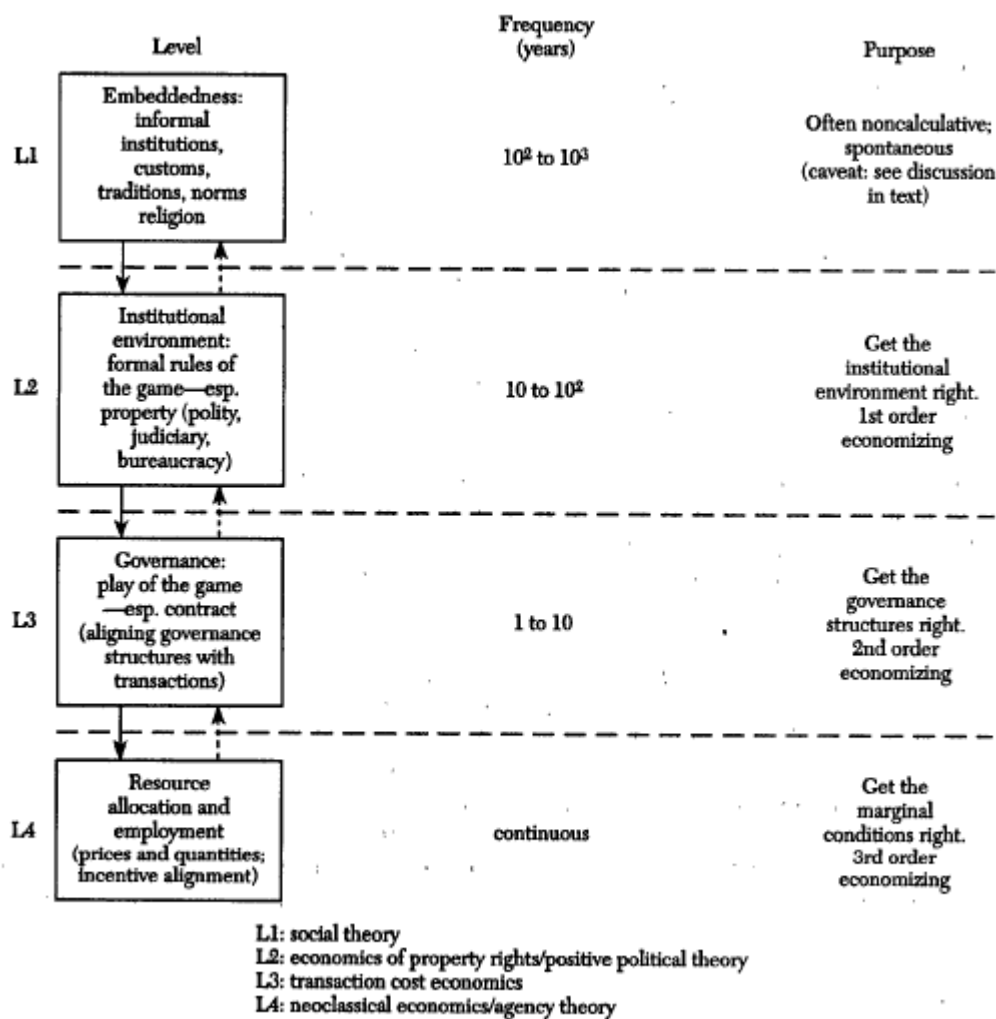


Figure 1. Economics of Institutions

Source: O. Williamson (2000) in Journal of Economic Literature, 38(3) 595-613. Copyright JEL

A cadastral interpretation of O. Williamson

Levels of social analysis L1..L4	Frequency (Years)	Examples
L1: Tradition, norms, religion	10 ² to 10 ³	Often non calculative, e.g. revolutions, reformations
L2: Institutional environment: The formal rules of the game	10 to 100	Change of property rights, e.g. through new constitutions, new taxes or restitutions, .. Redesign of government, e.g decentralization.
L3: Governance: Play of the game	1 to 10	Change of policy networks. Negotiations on functions, processes and information flows.
L4: Resource allocation and employment	Continuous	Exchange of assets: e.g. purchase of house; Change of property unit: e.g. subdivision

Source: O. Williamson (2000), interpreted in Stubkjaer (2006) FIG eGovernance, Budapest

Characteristics of North's notion of 'institution'

Institutions establish (or imply)

- roles and rights/ powers, e.g. of owners, chartered surveyors, .. [= Actors in STS]
- procedures, implemented as processes [e.g. conveyance, subdivision, mortgage, ..]
- new names and meaning to physical objects [e.g. legal boundary vs. ditch, markers]

Institutions are maintained by

- use (in terms of rituals or procedures), supported by writing and mapping technology
- teaching (in terms of socialization or schooling in new names, procedures and roles)
- promulgation (in terms of rulings or legislation)

Institutions are enforced by

- self-enforcement, motivated by longer term self-interest, fear, or moral (Rousseau: law in heart)
- social exclusion, ostracism
- third-party enforcement: Voluntary [e.g. by guild, association]; coercion by (strong) state;

This notion is a refinement of: Institution

a custom that for a long time has been an important feature of some group or society;
 "the instit. of marriage"; "the inst. of slavery"; "he had become an institution in the theatre"

Social elements of the Cadastre - Restructured

Formal	Informal
Legislation establish promulgated <ul style="list-style-type: none"> • roles and rights/ powers • procedures • new names and meaning to objects 	Social norms ~= Institutions They reflect basic values, belief systems (e.g. trust) Customary law
Statutes (of org.s, assoc.s) specify roles, etc.	
Standards (of technical nature)	Tacit knowledge
Institutions are maintained by teaching	
Processes prescribed by procedures	Rituals
Institutions are maintained by use, supported by writing and mapping technology	Institutions establish ... new names and meanings

6. Conclusion

The cadastre may be explained more essentially and appealing, by drawing on

- Recent research in technical infrastructure. However, "Specific legal frameworks or procedures are more difficult to transplant than more general and abstract policy lessons, ideas and ideologies" De Jong et al
- Skilful application of Douglass North's conception of 'institution'
- Ontology specification of (cadastral) business processes as already COST G9 Modelling Real Property Transaction demonstrated

Questions



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