# The Notion of Socio-Technical Systems

*Concepts and application on SDIdevelopment*

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# The Notion of Socio-Technical Systems - Concepts and application on SDI development

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**PhD course: Paradigms for Development of Spatial Data Infrastructures,**
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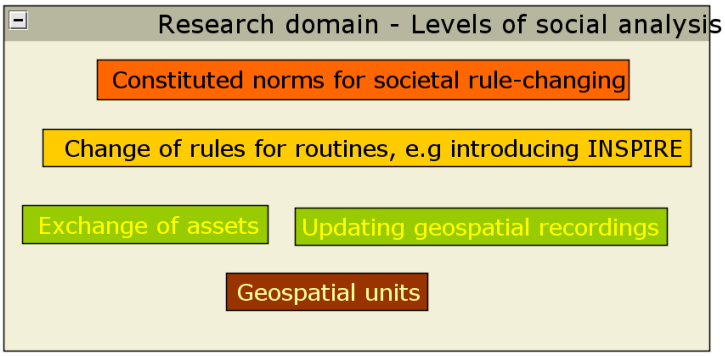
## Overview

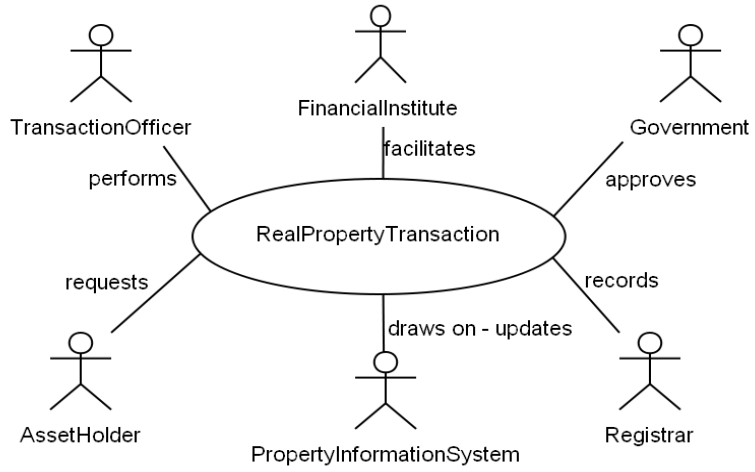
- Yesterday: The research domain and *the reflection* of the domain
- Today: Structuring *the research domain*,
- Basic componets of socio-technical systems
- Applying basic components on SDI development

## The research domain, as presented yesterday

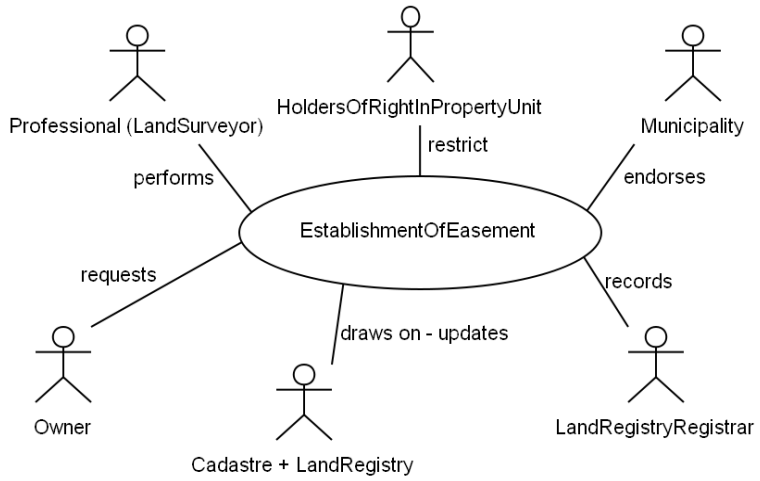





## Modelling ongoing activities in UML




## Modelling from general to specific: Case easement




## Nordic co-operation on modelling routine processes



http://www.kms.dk/Matrikelogejendomsdannelse/Nordisk+ejendomsregistrering/Nordisk.htm

## Generalisations are needed and possible:

To reduce information asymmetries and transaction costs, user needs may be stated in terms of the following *functional objectives*, which must be met within a jurisdiction:

- Property units are identified and located, and shape and size attributes are recorded.
- Rights in property units are categorized within the jurisdiction, adjudicated, and recorded.
- Skilful transaction officers are available to reorganise the rights in a real property unit and its surroundings at the wish of the parties, without compromising the claims of other holders of rights, and in compliance with spatial, environmental and agricultural legislation, etc.

**Functional objectives (cont.)**

- Skilful registrars verify of the powers of the disposer, safeguard the interests of other holders of right, and monitor further rule compliances.
- Involved agencies and professions offer compensation in case of occasional errors, and improve where possible the correctness and consistency of the recordings and the efficiency and transparency of business processes within the cluster enterprise.

Stubkjær: ScanGIS 2007

**Analysis of *social change* needs other concepts**

- New technology needs to be learnt, mastered, and practised
- Different - opposing or concurrent - interests need be taken into account

Georgiadou; Harvey (2007): "A weakness of spatial data infrastructure (SDI) studies has been the limited uptake of research outside of positivist and scientific- technological perspectives. .."

Proposal: Perceive the SDI as a socio-technical system.

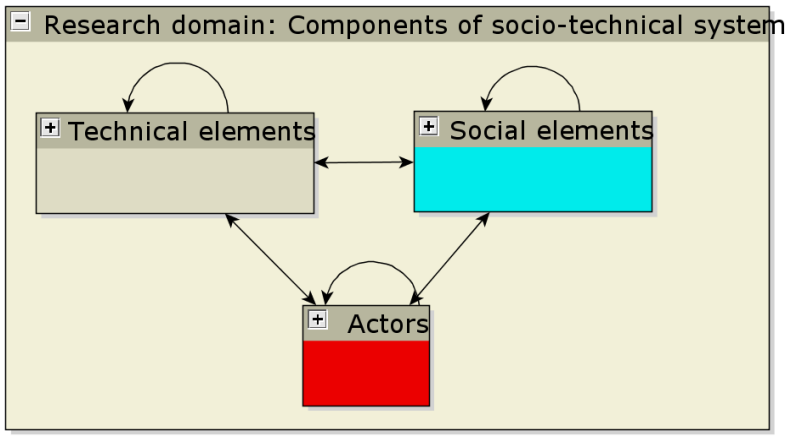
**Next Generation Infrastructure Project**

".. all of the relevant aspects - technical, social and managerial - are studied in their mutual coherence. .., by studying and comparing different sectors (such as transportation, the energy industry, telecom and water) we want to initiate, stimulate and improve cross-sectoral learning."

- ....
- Multi-Agent Decision Making with Incomplete Information in Traffic Control and Power Exchanges
- Modeling infrastructures as socio-technical systems
- ....

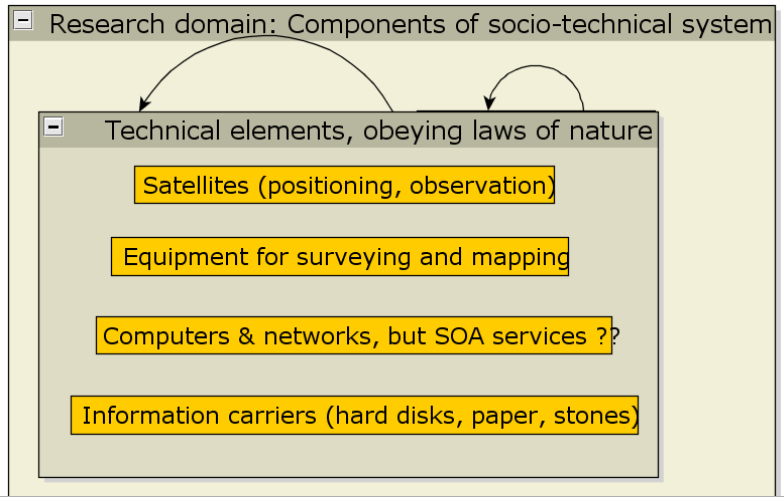
www.nginfra.nl

## New level (Change, not Exchange) → Other concepts

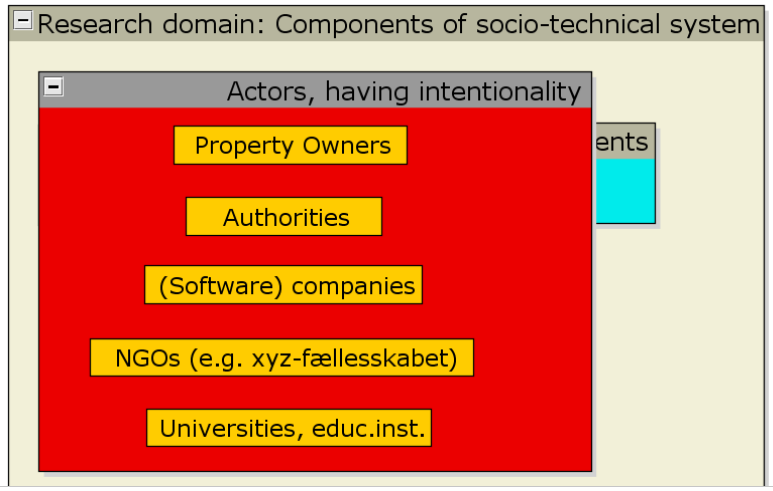



Stubkjær (2006) GIS development 10/6, pp 26-28.

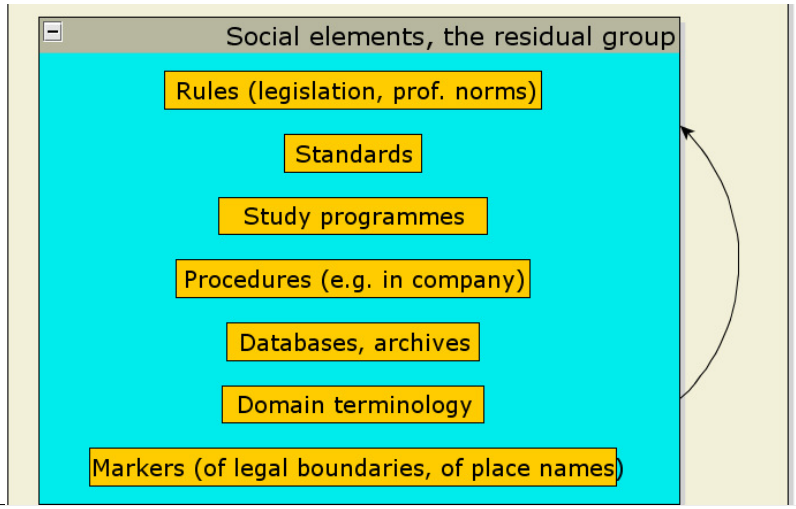
## Technical elements. Criteria: Obeying laws of nature




## Actors. Citeria: Having intentionality



**The third element category of a socio-technical system:**




**Summary**

- Yesterday: The scope and basic concepts of the course were introduced.
- An operational set of concepts was proposed:
  - Levels of social analysis, transactions, .. NIE
  - Actor, Policy network, ..
- Today, actors and technical elements were supplemented with 'social' elements, as proposed by ongoing European research.
- A research challenge will be to refine/ complete the lists and to analyse the relationships

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