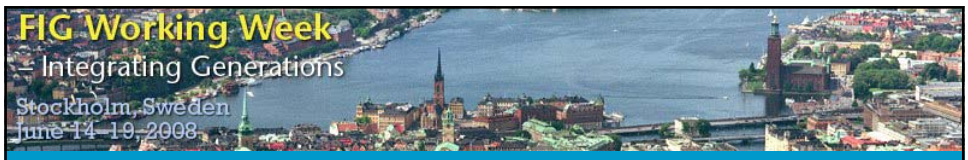

On the Level of Cooperation between Agricultural & Cadastral Parcel Registration

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The European Common Agricultural Policy (CAP) after 1992

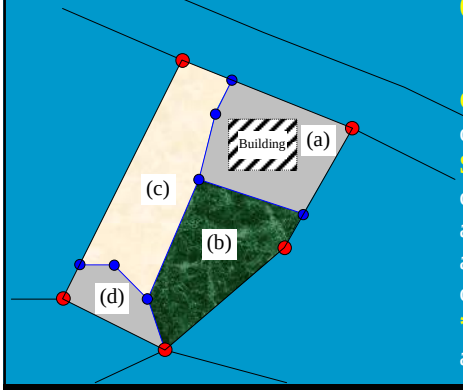
- Market Policy
  - De-coupled Direct Payments
- Rural Development (RD) Policy
  - Economic Development of Rural Population
  - Preservation of the Environment
- Integrated Administration and Control System (IACS) as a Tool for Implementation of the CAP
  - Land Parcel Identification System (LPIS) for spatial data

Rural Land Administration/Management

- Different LASs
  - History and Social structure
  - Fiscal and/or Legal purposes
  - Coordinated by different Organisations
  - Different content & technology use
- Different LPISs
  - Dependant on LAS or not
  - Reference parcels (Agricultural, Farmer or Physical)
  - Use of Digital Ortho Photo/Imagery Products
  - Use of Large Scale Topographic Maps

The Relation Between LAS & LPIS (1)
Sub-Parcels in LAS

Reference / Agri. Parcel
Cadastre / Sub-Parcel



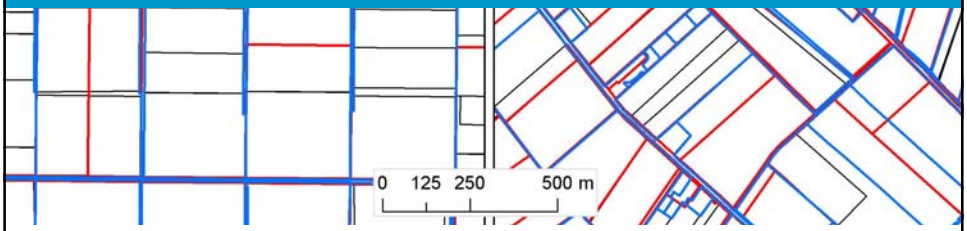
(a) and (d): Non Agricultural Area
(b): Planted Agricultural Field
(c): Cultivated Agricultural Field
● : Cadastre Parcel Corner Point
● : Sub-Parcel Corner Point
Cadastre Parcel*: The area composed of connecting Cadastre Parcel Corner Points.
Sub Parcel*: Each area composed of connecting Cadastre Parcel Corner Points and/or Sub Parcel Corner Points. The total area of sub parcels equals the area of the cadastre parcel.
* Parcels are defined by boundaries, which are specified by connecting corner points.

The Relation Between LAS & LPIS-2
Farmers and Farming Rights in LAS

- Farmers (Users) in LPIS
- Owners in LASs?
- Owners and other right holders (full land tenure info.)
  - Leaser for any purpose
  - Leaser for Agricultural Activity
  - User for Agricultural Activity (with consent by owner)
    - Consent from first order relatives
    - Consent from share holders
- Some LASs cannot cover such full land tenure info.

The Relation Between LAS & LPIS (3)
Geometry Overlap; Case Study in the NL

- Study Areas
  - NO-Polder (400 km^2, 9300/4500 agri./ref. parcels)
    - Newly established area
    - With even shaped landscapes
  - Twente (1000 km^2, 43.000/44.000 agri./ref. parcels)
    - An old area
    - With complex shaped landscapes



The Relation Between LAS & LPIS (3)
Geometry Overlap; Results

Boundary Overap

		Intersection		with Agricultural Parcels				with Reference Parcels			
		Tolerance		1m	2m	3m	5m	1m	2m	3m	5m
	NO-Polder	any	km	1479	2140	2449	2715	1530	2259	2556	2792
			%	23	33	38	42	35	51	58	63
		> 100m	km	1408	2092	2412	2678	1425	2166	2471	2693
			%	22	33	38	42	32	49	56	61
	Twente	any	km	7146	11407	12908	13408	5800	10803	12721	12815
			%	33	53	59	62	25	48	57	57
		> 100m	km	5479	9723	11228	11271	4212	8956	10825	10295
			%	25	45	52	52	19	40	48	46

The Relation Between LAS & LPIS (4)
Admin. Info. Content Share; LAS/LPIS

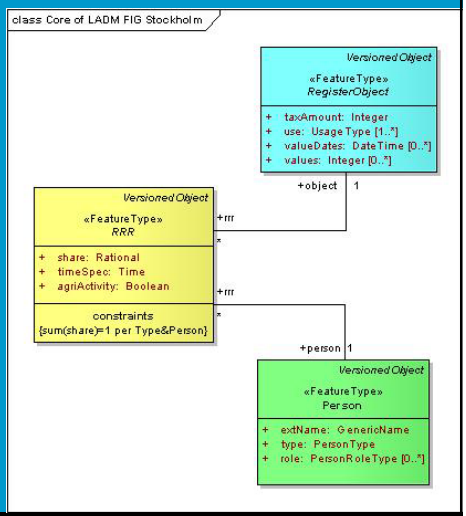
- Person
  - The user in LPIS/IACS → Right holder in LAS
  - Informal rights → Formal rights (informal/formal land tenure)
- Land Use Type
  - General Land-use types in LAS (differs)
    - Housing, industry, agriculture, etc.
  - Specialized Land-use types in LPIS/IACS (differs)
    - Fallow land, vegetable garden, permanent crop, pasture, grassland, eligible land for aid no1-no2, etc.

Three Possible Collaborations

- Full Integration (proposed/ideal)
  - Physical integration (Partly or No),
  - Data redundancy (No).
- Sharing Data at a Certain Extent (acceptable)
- Sharing a System Development Pattern (at least)

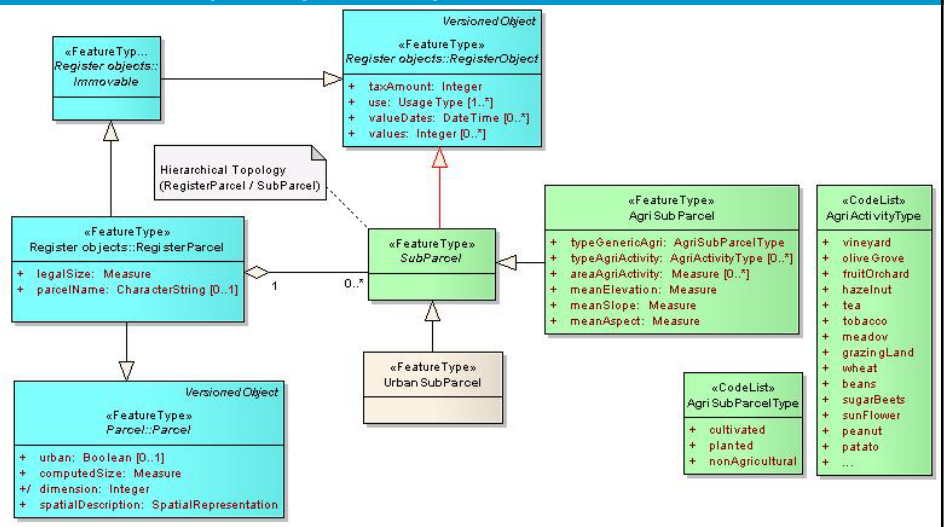
Land Administration Domain Model
the LADM

- History of LADM
  - Several years of development
  - Several versions
- As an ISO TC211 Standard
  - Proposal (Accepted) to the ISO by FIG (ISO/LADM 19152)

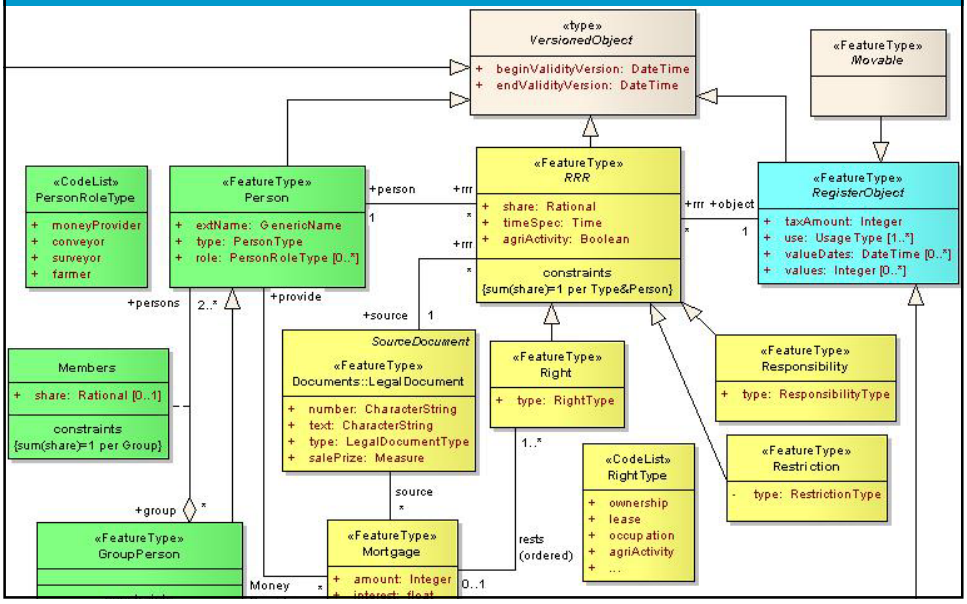


Integrated Solution
SII Design based on LADM (1)

- LADM Spatial (Cadastre) Part



Integrated Solution
SII Design based on LADM (2)



Collaboration towards Integration
Different Legacy Systems LPIS & LAS

- Different Systems with a certain extent of information share
  - Person registry
  - Registration of rights (communication between different registries)
- Different Systems with no information share; Only some similarities on the pattern of system development
  - Management of land related rights in the same manner with different data sets (Person, Parcel)

MDA for Better Design and Implementation

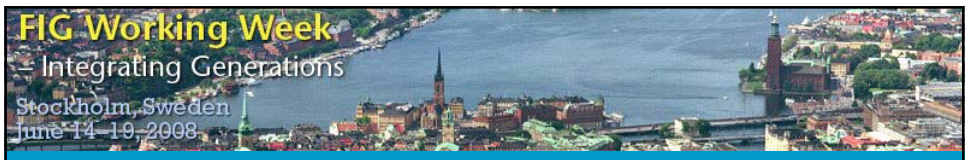
- PIM (UML class diagram) to PSM (DB Schema) through MDA
- Easy Design at PIM level
  - No need to care about platform specific details,
  - Just concentrate on the nature of the data,
  - Design information share model
- PSM Transformation
  - Currently Semi-Automatic
  - OO – Relational
  - Data Types (geometry/topology), Constraints (spatial).

A Possible Collaboration in View of Standardization Initiatives

- INSPIRE
  - SII for Environmental Information
- LADM
  - Standard domain/information model for LA
  - Integration of LAS and LPIS via LADM
- LPIS Core Model
- MDA
  - A Bridge between Modelling and Application

Conclusions

- LASs and LPISs deal with different aspects of rural land. But they have closely related spatial and administrative data content.
- They do not have any common collaboration rule. This causes data redundancy in a certain extent.
- Lack of Collaboration is caused by the fact that both systems have different system structures throughout the EU.
- Integration/Collaboration? Three ways/stages.
- LADM and LPIS core model initiatives.
- An initiative to define collaboration rules.



Thanks…

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