Remarks and Observations related to the further development of the Core Cadastral Domain Model

Bamberg, December 10 2004

Peter van Oosterom, TU Delft
Christiaan Lemmen, Kadaster/ITC
Paul van der Molen, Kadaster/ITC
Agenda

1. Introduction
2. Cadastral Domain Model, summary
3. Experiences from developing countries
4. Impact on the Cadastral Domain Model
5. Boundary of the System
6. Main proposed changes
7. Conclusions
Standards

• There are supposed to be huge differences between systems
• Look to the common area’s:
  • Standardised Model
  • Avoid re-inventing the wheel
  • Enable involved parties to communicate
Basic datamodel

1. Formal Ownership
2. Customary
3. Indigenous
4. Tenancy
5. Starter, landhold, freehold
6. Possession
7. Mortgage
8. Usufruct
9. Long Lease
10. Restriction Type 1
11. Restriction Type 2
12. State
13. Informal
14. Unknown
15. Disagreement
16. Occupation
17. Uncontrolled privatisation
18. Conflict

Overlap

1. Natural Person
2. Company
3. Municipality
4. Co-operation
5. Group
6. Ministry

Biometric identification

One Point
Lines
Polygon (low accuracy)
Polygon (high accuracy)

Quality labels

1. Parcel
2. Apartment
3. Building
4. Spatial Unit
Complete (modular)
Cadastral Domain Model
Work Flow

- Guides User through all steps in a Job
- Controls the Work Process
- Includes manual- & automated steps

**Interorganisational workflows**
Again: standards to be developed
Data Acquisition

- Different accuracy in different area’s
- It should be more easy to combine different data acquisition methods with available data sources
- Lidar, Ikonos, Quickbird, GPS, Galileo, Cyclomedia, Tape measurements, Total stations, Ortho Photo’s, Aerial Photographs
- Source documents
- WGS/UTM
- No monumentation
Field survey: data production

T: total station
L: measuring line
M: distance-series
Boundary of the system - why needed?

- Every object is related to ‘something’ else (currently not is the model) and again ‘something’ else object classes are related to yet other object classes
- It is tempting to keep on adding packages to make the model more and more complete
- However, this will be never ending and we have to draw the boundary somewhere
- It helps to realize that other objects may be accessed via the GII
- Often when comparing 2 models the differences are more often the result of different boundary
Boundary of the system - inside as in Brno model, outside:

- Spatial reference system
- Ortho photo, satellite, Lidar
- Topography
- Geology, geo-technical, soil
- Pipelines and cables
- Addresses (postal codes)
- Building registers
- Natural person registers
- Non-Natural person registers
- Polluted area registers
- Mining right registers
- Cultural history
- (Religious) monuments
- Fishing/hunting/grazing rights
- Ship/airplane (car) registers
- ...
Boundary of the system - some remarks

- Boundary is a bit arbitrary (based on what is practical and the custom in most countries)
- Ok, now the other objects are outside the model (and within GII), this does not make it easier: the different models have to be harmonized
- Also, under what conditions is one organization accepting to be dependent on the information of another organization for its (primary) tasks
- Information assurance: available, quality, history,...
Boundary of the system - distributed model/system

- How to maintain consistency between different parts of a distributed system (model contents)?
- What happens when the source removes an object to which another system is referring?
- Temporal solution: use history version of referenced object
- Better: update the reference itself (application/business dependent)
- Provide generic ‘update warning system’ to subscribers
Main proposed changes - Group
Main proposed changes - Parcels...

- Not always available in the format of a planar partition
- Sometimes just one references point available or ‘unconnected’ polygon (or spaghetti) † these solutions may be sufficient (and cost effective)
- How to integrate both approaches in one model?
- High quality planar partition should not be degenerated by point/spaghetti parcels
- Divide domain into two types: planar partitioned regions and non-planar partitioned (NPP) regions
Main proposed changes - 3D spatiotemporal objects

- 3D as introduced in Brno version of model
- However temporal/dynamic aspect relevant:
  - Long lease (or ownership for limited time)
  - Nomadic behaviour
  - Time-sharing (mon-fri:X, sat-sun:Y)
  - Fishing/hunting rights during certain season
- Pracels not always sharp (point/spaghetti)
- 3D spatiotemporal parcels with (possibly) fuzzy boundaries as fundamental unit in most generic model
Conclusion

- More sharing of knowledge, improved via FIG Standards Network, ISO TC 211, CEN TC287 (soon domain models), OGC Property and Land Initiative
- Current proposal is under development, workshops, reviews, Cairo
- More attention to process side (in addition to data side)
- Not only the model itself is important, but the fact that there is consensus (also important role of industry)
Thank you