The German ALKIS-ATKIS project
A new approach to spatial information management
Presentation

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Overview

- introduction
- cadastral and topographic systems today
- new integrated ALKIS-ATKIS model
- using ISO/TC 211 standard family 19100
- final remarks
Introduction (I) - Abbreviations

- **ALB**
  Automated Real Estate Register

- **ALK**
  Automated Real Estate Map

- **ALKIS ®**
  Authoritative Real Estate Cadastre Information System (Integration of ALB and ALK)

- **ATKIS ®**
  Authoritative Topographic-Cartographic Information System
Introduction (II)

cadastre information
scale 1:500...1:2000

ALB
ALK

new integrated ALKIS-ATKIS model

topographic information
scale 1:25000...1:1 Mio

ATKIS
Federal Structure of Surveying and Mapping in Germany

- independent responsibility of the Mapping Agencies of the States
- coordination under umbrella of the German AdV (Working Committee of the Surveying Authorities of the States of the Federal Republic of Germany) www.adv-online.de
- integration of ATKIS data by the Geodata Center of the Federal Agency of Cartography and Geodesy (Clearing house) www.geodatenzentrum.de
Cadastral systems today (I)

ALB

- ALB = real estate register
- digital *register* about properties
- state: 100 % in digital form
- contents
  - parcel number, owner, (street) name, area, land use,...
- without direct geometry
- no GIS
Cadastral systems today (II)

ALK

- ALK = real estate map
- digital **graphic map** of properties (1:1000)
- state: 50...80 % in digital form
  cities are finished
- feature catalogue
  parcels, buildings, texts, topographic elements,...
- with object geometry
- no GIS
Topographic systems today

ATKIS (I)

- Digital Landscape Model (DLM)
  1:25000, 1:200000, 1:1 Mio

- feature catalogue
  rules for describing topographic information
  (*object class catalogue*)

- symbol catalogue
  rules for cartographic presentation
  (*portrayal*)
Topographic systems today
ATKIS (II)

Feature Catalogue
Rules of depiction of topographic information in the DLM

Symbol Catalogue
Rules for cartographic representation of the information in the DKM

German Basic Map 1:5000

capturing modelling

D Digital Landscape Models
cartographic process

D Digital Topographic K Map

preparation for output

Map

User of digital data

EDBS

Uniform Data Base Interface

TIFF

Workshop Standards in Action, Lisbon
Deficits of today’s cadastral and topographic systems

- missing integration of graphical and attribute data
- missing semantic harmonization of ALKIS and ATKIS
- non-consistent data modelling between cadastre and topography
- difficulties in realization of cartographic aspects
- no standardized notation of the data models and the exchange structure (encoding)
- no concept to integrate additional data (metadata, quality data)
Idea of integration (I)
Idea of integration (II)

Combination of topographical (land use) and cadastral (parcels, buildings) data
Demands to an integrated conceptional data model

- standardized notation and encoding
- integration of
  - additional data (quality data, metadata, etc.)
  - objects without spatial reference
- enable to
  - reference to other GIS objects
  - manage different temporal versions of the same object
  - include cartographic information
New integrated ALKIS-ATKIS model

- using ISO/TC 211 standard family 19100
- standardized notation (UML)
- migration to the new model
- enable to manage historical data
- harmonized cadastral and topographic feature catalogues
- standardized data interface (XML based)
- extensive GIS functionality
ALKIS-ATKIS reference model

ALKIS-ATKIS catalogues

maps, other data

digital image model

ALKIS data

ATKIS-DLM

TIFF

NAS

dig. ALKIS data

ATKIS-DTK

TIFF, DXF, ...

distributed to

nondig. ALKIS data
topographic map

presented in

regulates

describes

user
Migration to the new model (I)

- definition of a new integrated data interface (NAS)
  **NAS**: *standardized data interface*

- conception of migration:
  - transformation of the old data into the new model (step-up compatibility, EDBS -- NAS)
    
    *EDBS = Uniform Data Base Interface*

  - support of users in the old data model (EDBS-data) (step-down compatibility)

- definition of functions (e.g. for presentation, processes)
Migration to the new model (II)

ALK ATKIS (old) → EDBS → Conversion → User

ALKIS-ATKIS (new) ↔ NAS ↔ User

ALB (old) → WLDGE LBESAS → Conversion

Conversion
Metadata System of the Geodata Centre

- structure within the ALKIS-ATKIS concept
- using firstly a CEN-based prototype within the Geographic Data Description Directory (GDDD) of EuroGeographics MEGRIN
- will be update to ISO 19115
- this metadata system structure will be used also in other Federal Agencies in Germany
Topographic ATKIS Geodata

- representing an investment of several hundred million DM
- quality checking elements were integrated into the ATKIS model and a quality management is under preparation
- distribution via the internet is under preparation
- www.atkis.de
Level of ISO 19100 using

- fundamental using
- using now
- using in next time
- using in future
ISO 19100 - Fundamental using

- 19101 Reference model
- 19102 Overview
- 19104 Terminology
ISO 19100 - Using now

- 19103 Conceptual schema language
- 19107 Spatial schema
- 19109 Rules for application schema
- 19110 Feature cataloguing methodology
- 19112 Spatial referencing by geographic identifiers
- 19113 Quality principles
- 19114 Quality evaluation procedures
- 19115 Metadata
- 19118 Encoding
ISO 19100 - Using in future

- 10105 Conformance and testing
- 19108 Temporal schema
- 19111 Spatial referencing by coordinates
- 19127 Geodetic codes and parameters
ISO 19100 - possible using

- 19117 Portrayal
- 19121 Imagery and gridded data
- 19123 Schema for coverage geometry and functions
- 19124 Imagery and gridded data components
ALKIS-ATKIS package in the ISO model (I)

- ISO 19115 Metadata
- ISO 19109 Rules for App Schema
- ISO 19110 Feature Cataloging
- "<<Application Schema>> AAA-Anwendungsschema"
ALKIS-ATKIS package in the ISO model (II)
Final remarks - main advantages

- one uniform data model for cadastral and topographical objects
- one uniform data base interface
- cartographic modelling is integrated
- demands of users are regarded
- migration to the new model
Final remarks - next presentations

- Clemens Portele  
  ALKIS-ATKIS modelling using ISO standards

- Jürgen Ebbinghaus  
  Implementing ALKIS-ATKIS model using ISO standards