

**PCC Plenary Meeting, Warsaw 2011**

# **Standards and Data model of the Cadastre in Austria**

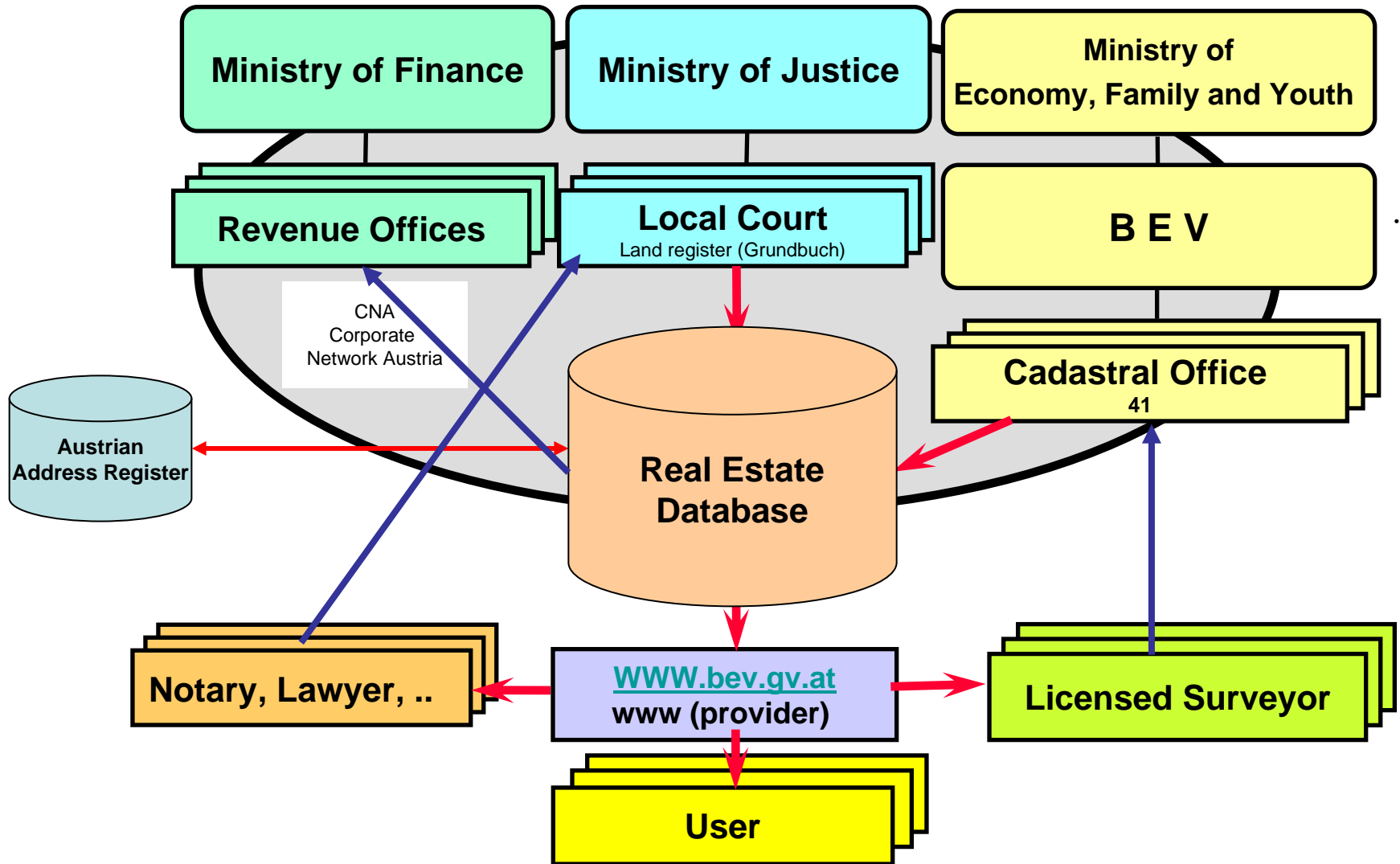
**Julius Ernst**

**BEV - Federal Office of Metrology and Surveying**



# Contents

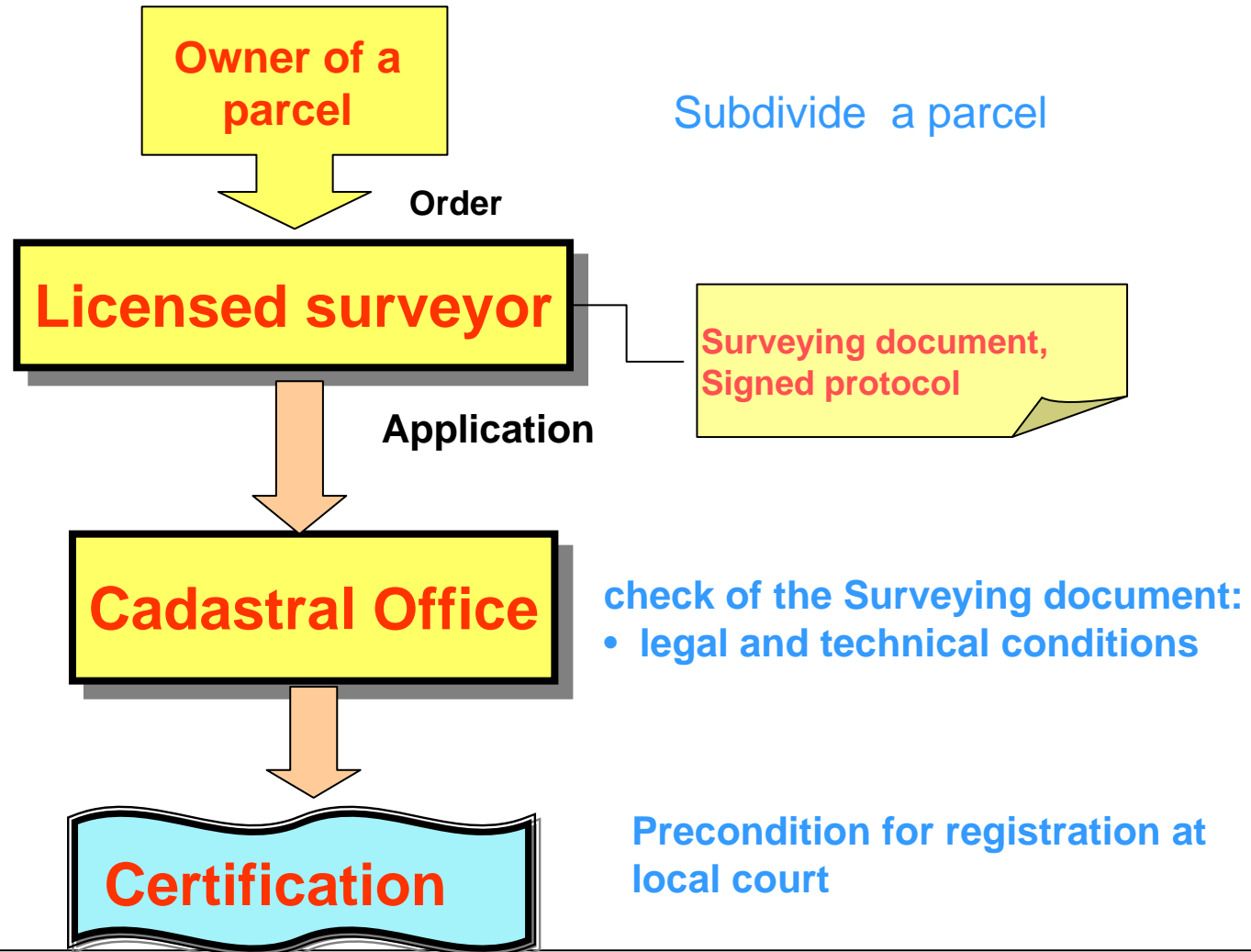
- Principals, competences and responsibilities
- Data structure of the DKM
- Process to update/store the DKM
- INSPIRE- Data model versus DKM
- Conclusions

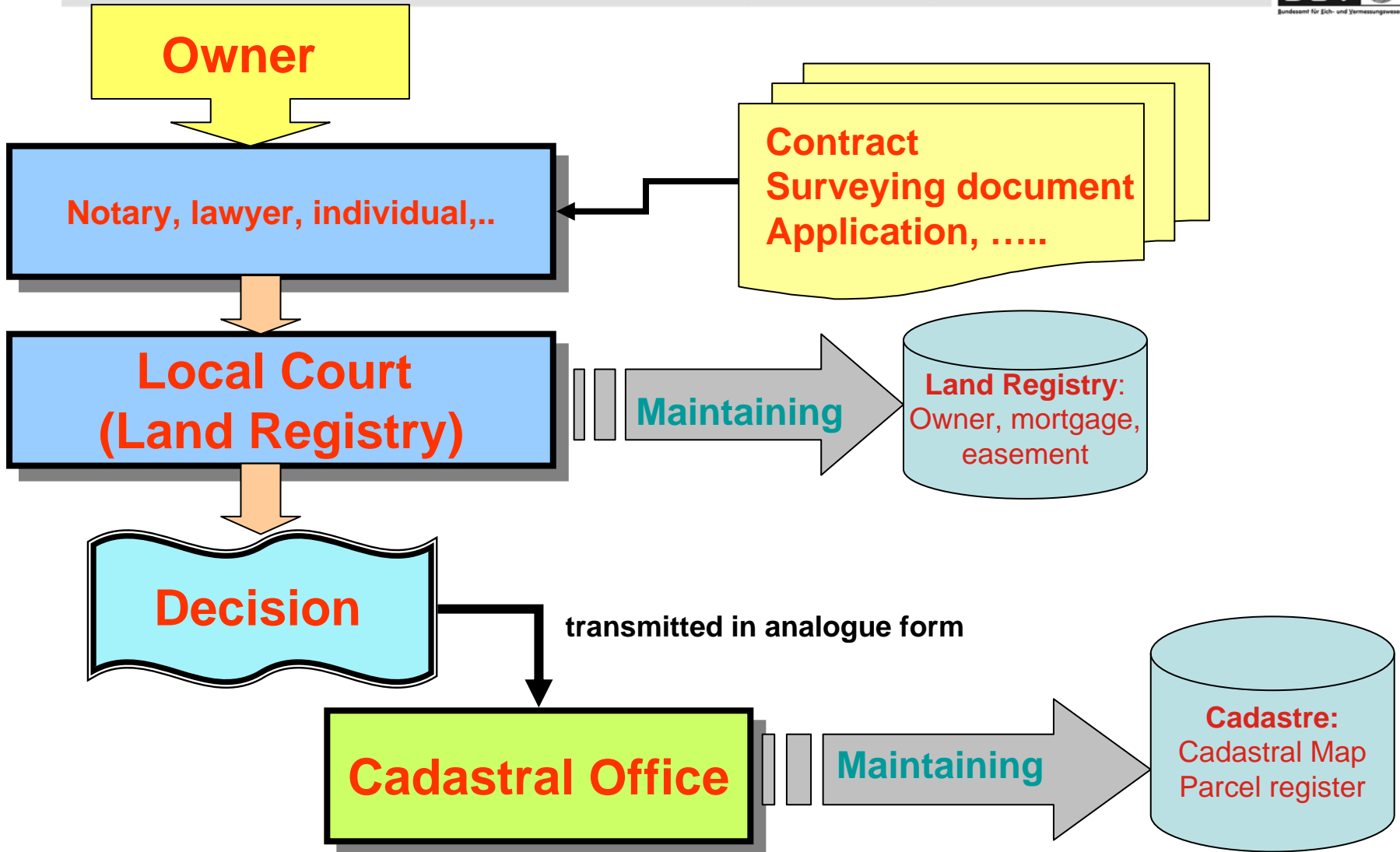


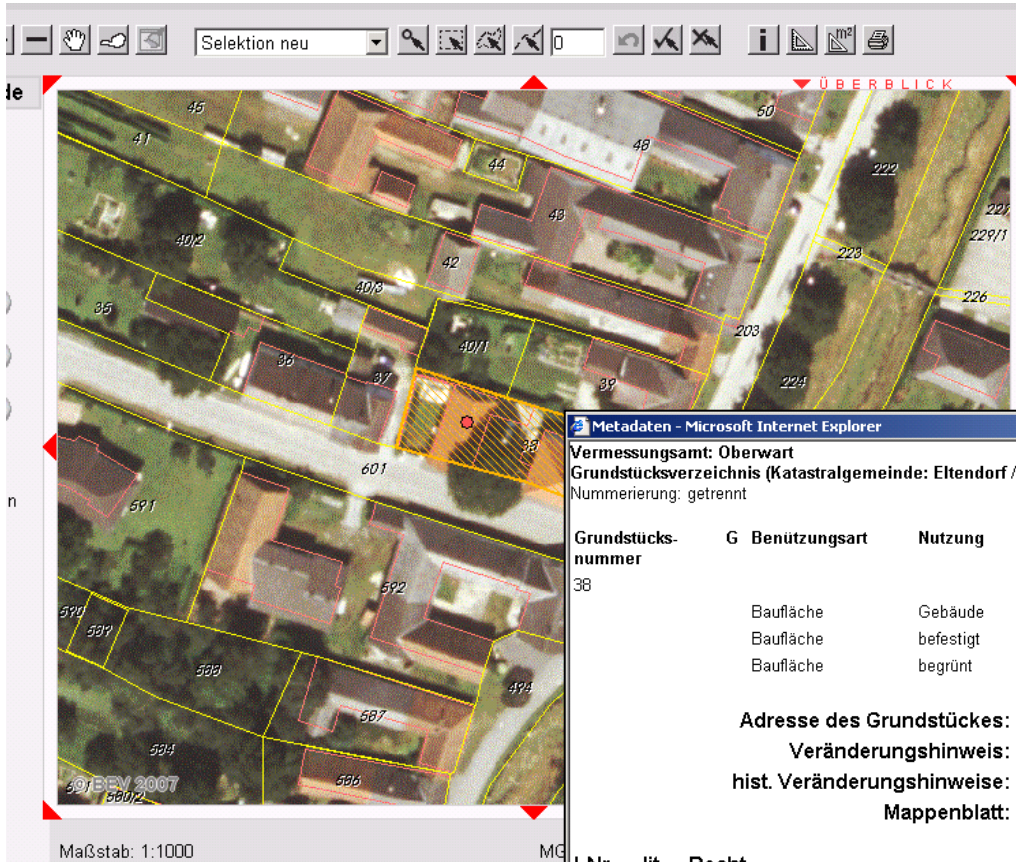
# Characteristics of the Austrian Cadastre

- Purpose
  - Taxation and evidence of (legal) boundaries (since 1969)
  - information about area, land cover, certified changes,..
- Cadastral information includes
  - Digital cadastral map, Register of parcels, Document register, Address register
- Public register – access for anyone
- Information via web-portal , fees
- Covering entire territory (Nation-wide availability)
- **100 % in digital format**

# Process of registration ...







Online- Access to cadastral data via web portal of the BEV:  
**e-geodata Austria**

Metadaten - Microsoft Internet Explorer

Vermessungsamt: Oberwart  
 Grundstücksverzeichnis (Katastralgemeinde: Eltendorf / 31106):  
 Nummerierung: getrennt

Grundstücksnummer	G	Benützungsort	Nutzung	Flächenindikator	Fläche [m <sup>2</sup> ]	Grundbuchsnummer	Einlagezahl	Ertragsmesszahl
38				*	791	31106	837	
		Baufläche	Gebäude	Teilfläche	439			
		Baufläche	befestigt	Teilfläche	233			
		Baufläche	begrünt	Teilfläche	119			

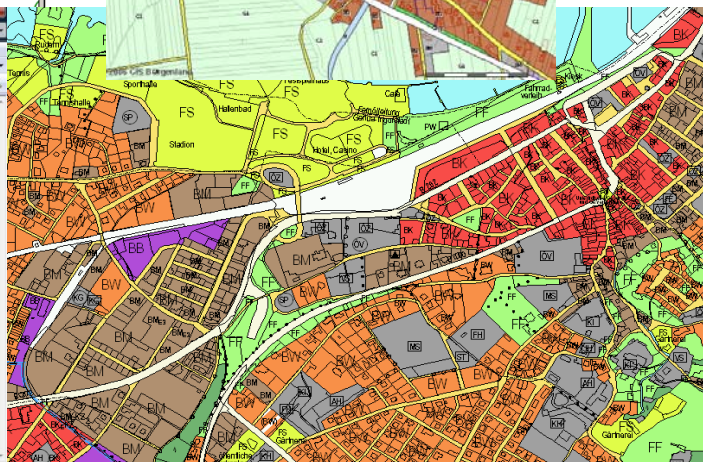
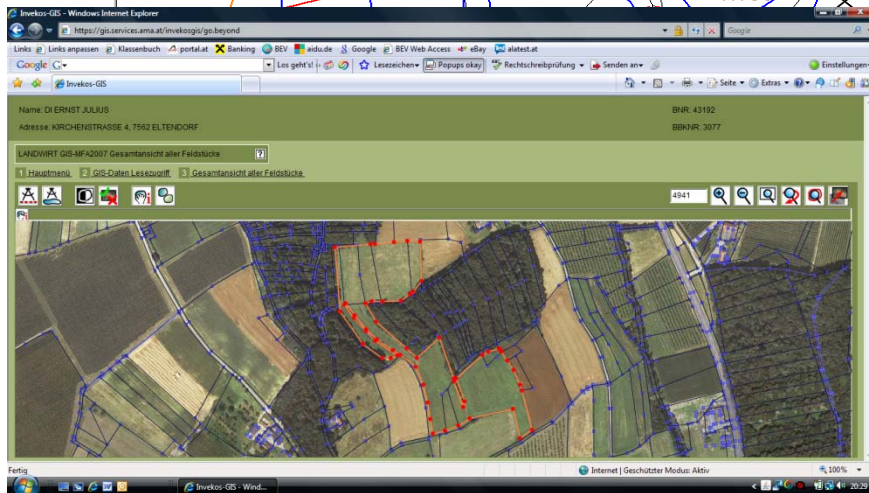
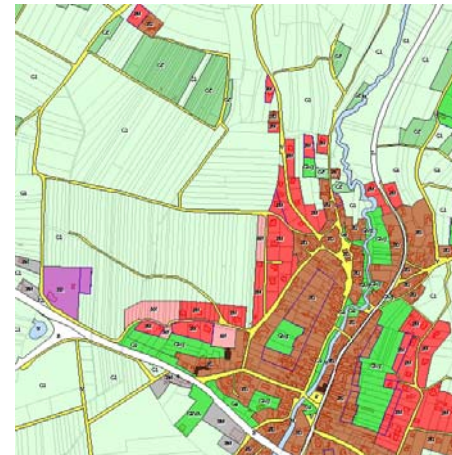
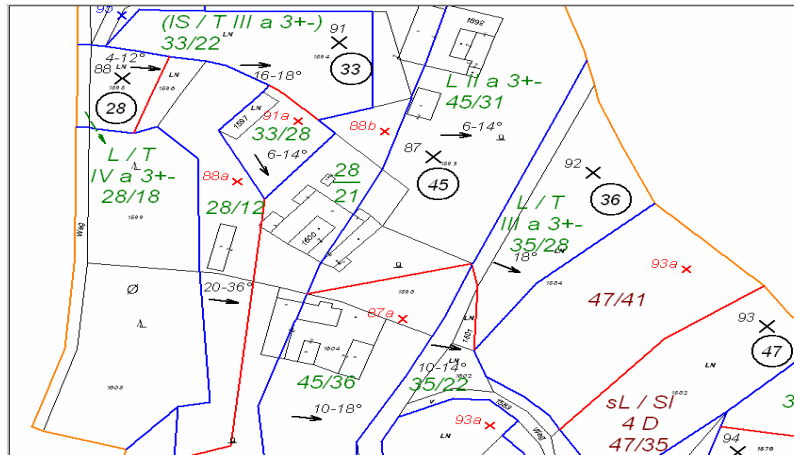
**Adresse des Grundstückes:** Kirchenstraße 4  
**Veränderungshinweis:** 499/1998  
**hist. Veränderungshinweise:** 1/1993  
**Mappenblatt:** 7421-24/2

LNr	lit.	Recht
2	a	2592/1994 Die Erhaltung des Hauses auf Gst 38 liegt im öffentlichen Interesse
3	a	gelöscht

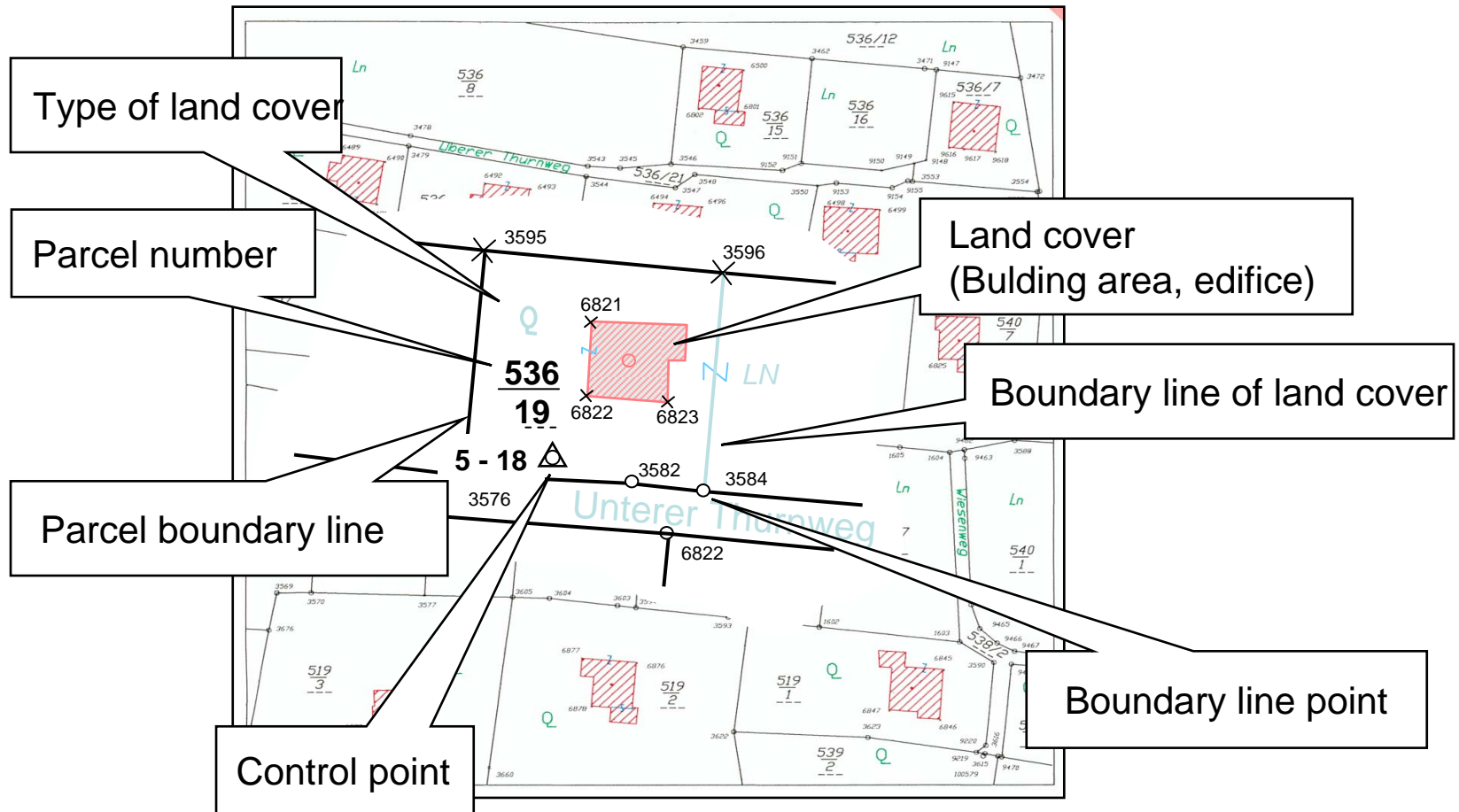
B-Blatt (Eigentümer)    C-Blatt (Belastungen)

Schließen

# Examples for use of Cadastre



# Contents of the Digital Cadastral Map



# Extract from Real Estate Database

AUSZUG AUS DEM GRUNDSTÜCKSVRZEICHNIS

KATASTRALGEMEINDE: 31106 Eltendorf

VERMESSUNGSAMT: Oberwart

\*\*\*\*\*

EINGABE: 38

NUMMERIERUNG: fortlaufend

GRENZKATASTER: TNA

\*\*\*\*\*

\*\*\*\*\* 2006-11-27

Cadastre  
data

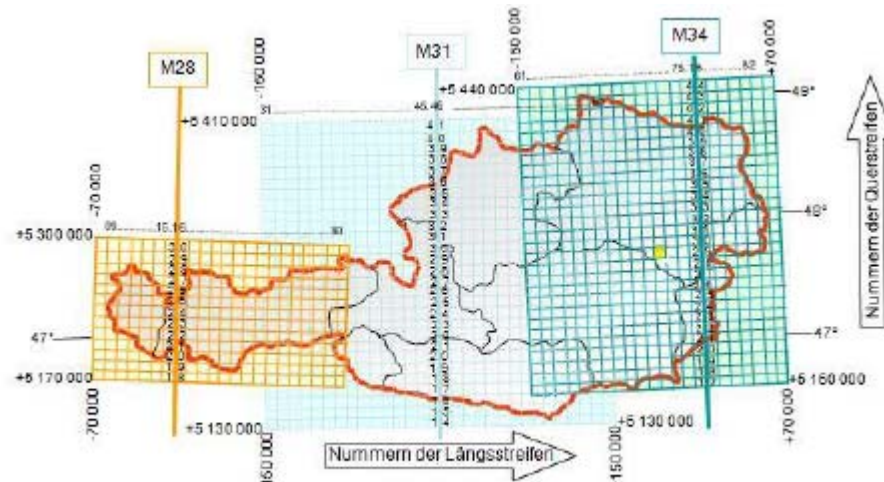
GST-NR	G	MBL-BEZ	BA (NUTZUNG)	FLÄCHE	EMZ	VHW	GB-NR	EZ
38		7421-24/2		* 791		499/1998	837	
			Baufl. (Gebäude)	T 439				
			Baufl. (befestigt)	T 233				
			Baufl. (begrünt)	T 119				
			Eltendorf 16					

Land Registry  
data

EZ	LNR	EIGENTÜMER
837	1	ANTEIL: 1/2 Ernst Julius Dipl.-Ing. GEB: 1959-02-28 ADR: Eltendorf 165 7562
	2	ANTEIL: 1/2 Ernst Cornelia Mag. GEB: 1961-11-16 ADR: Eltendorf 165 7562

\*\*\*\*\* 2006-11-27 10:19,07228 BA \*\*\*\*\* ZEILEN: 21

# Coordinate reference system



MGI / Austria GK Central (EPSG Code: 31255)	
geodätisches Datum	Militär-Geographische Institut (MGI)
Ellipsoid	Bessel 1841
große Achse (a)	6.377.397,155 m
Abplattung: 1/f	299,1528128
Meridian	Greenwich
Bezugspunkt	Hermannskogel geografische Breite: 48°16'15,29" N geografische Länge: 16°17'41,06" E (von Greenwich)
verwendete Fläche	Österreich zwischen 11°50' E und 14°50' E von Greenwich, 29°30' und 32°30' E von Ferro
Projektionsmethode	Österreich Gauß Krüger Central, Transverse Mercator
Maßstabsfaktor	1
Add. Konst. Rechtswert	0 m
Add. Konst. Hochwert	-5.000.000 m

- Gauß- Krüger projection (Transversal Mercator)
- 3- degree- stripes for Austrian territory
- cm- accuracy of coordinates

# Data structure of the DKM

- (partly) according to the AutoCAD- Software
  - DXF- format is broadly used also outside BEV
- Structured in logical layers
- Graphical elements
  - POLYLINE
  - CIRCLE
  - BLOCK REFERENCE (INSERT)
  - TEXT

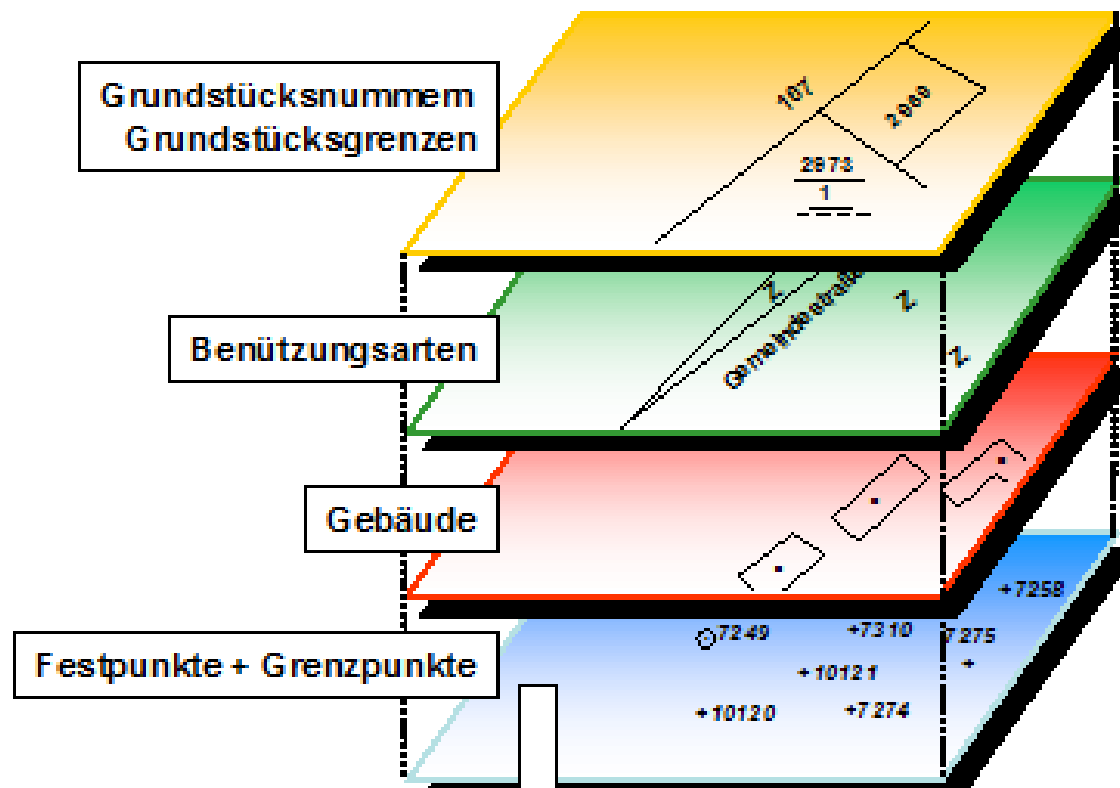
# Basic elements of the DKM

- Points, lines, symbols, text, attributes
- Square elements:
  - Parcels, land cover
- Block information:
  - Combination of symbols and attributes
  - e.g. Border point: symbol, point number, attribute (indicator, )
- Connection to central database:
  - number of administrative unit, point number,..

# Data structure of the DKM

- Defined objects
  - Map Sheet
  - administrative borders and borders of parcel (state border, province,... administrative unit, borders of parcel )
  - Parcel number
  - Land cover (lines, symbol,..)
  - Buildings
  - Other lines, symbols,..
  - Border-, state border -, control points






# Logical layers of the DKM



# Symbols for parcel number...

9.4.3 Grundstücksnummer			
<u>234</u>	GN1	*82	Grundstücksnummer einzeilig Grundsteuerkataster
<u>123</u> <u>456</u>	GN2	*82	Grundstücksnummer zweizeilig Grundsteuerkataster
<u>234</u>	GN1G	*83	Grundstücksnummer einzeilig Grenzkataster
<u>123</u> <u>456</u>	GN2G	*83	Grundstücksnummer zweizeilig Grenzkataster


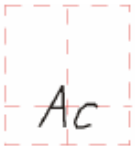


# Symbols for control points

	325-41	FIG011	*1	Triangulierungspunkt (TP) – Bodenpunkt (Hauptpunkt)
	325-41	FIG012	*2	TP - Kirche
	325-41	FIG013	*3	TP - Sonstiger Hochpunkt
	15	FIG014	*4	Einschaltpunkt (EP)
	27	FIG017	*6	Polygonpunkt (PP), Messpunkt (MP)

# Symbols for points...



9.2 Grenzpunkte, Staatsgrenzpunkte			
	FIG020	*11	Grenzpunkt (GP) nicht gekennzeichnet (schräges Kreuz)
	FIG024	*7	GP gekennzeichnet (mit senkrechtem Mittelstrich)
	FIG025	*7	GP indirekt gekennzeichnet (ohne senkrechtem Mittelstrich)
	FIG124	*7	GP gekennzeichnet, keine Punktnummer

# Symbols for land cover

9.3.2 Landwirtschaftlich genutzte Grundflächen (LN)			
	FIG048	*31	Landwirtschaftlich genutzte Grundflächen (LN)
	FIG049	*32	Acker
	FIG050	*33	Wiese
	FIG089	*34	Streuobstwiese

# Symbols for belonging to ...

## 9.4.1 Klammersymbole

 The symbol '§' is enclosed within a red dashed rectangular border.	FIG031	*25	Zugehörigkeit von Grundflächen zu einer Nutzung
 The symbol 'Z' is enclosed within a red dashed rectangular border.	FIG032	*26	Zugehörigkeit von Benützungsabschnitten zu einem Grundstück

# Process to store DKM \_1

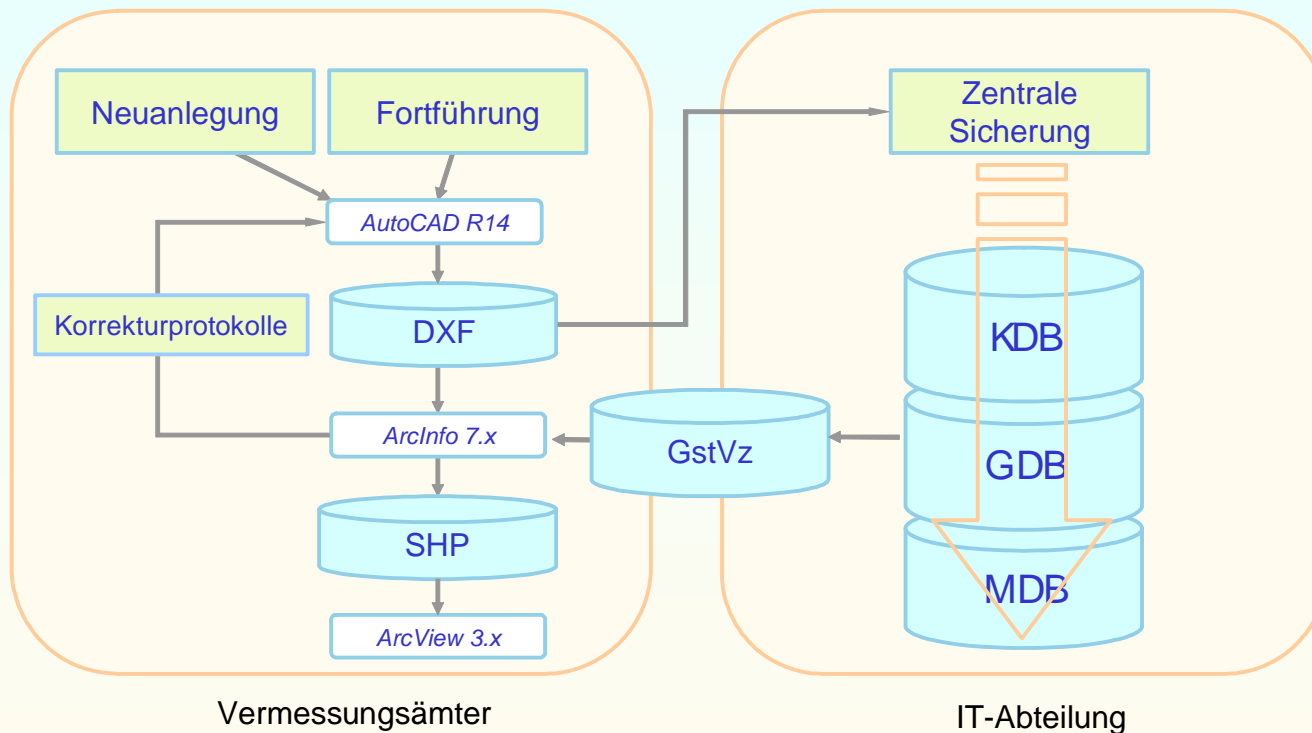
1. Maintaining and checking of the DKM
  - BEV-DKM-Application: AutoCAD
  - “local” check of the DKM: nodes- lines- structure,..
  - Automatic check of map sheets: Points, coordinates, cadastral units, etc.
2. Checking and reload of DKM in Shape-Format
  - Check of all objects, indicators, cadastral unit,..
  - Report of all errors (“K-files”) > improve data
  - Generate shape- files

# Process to store DKM \_2

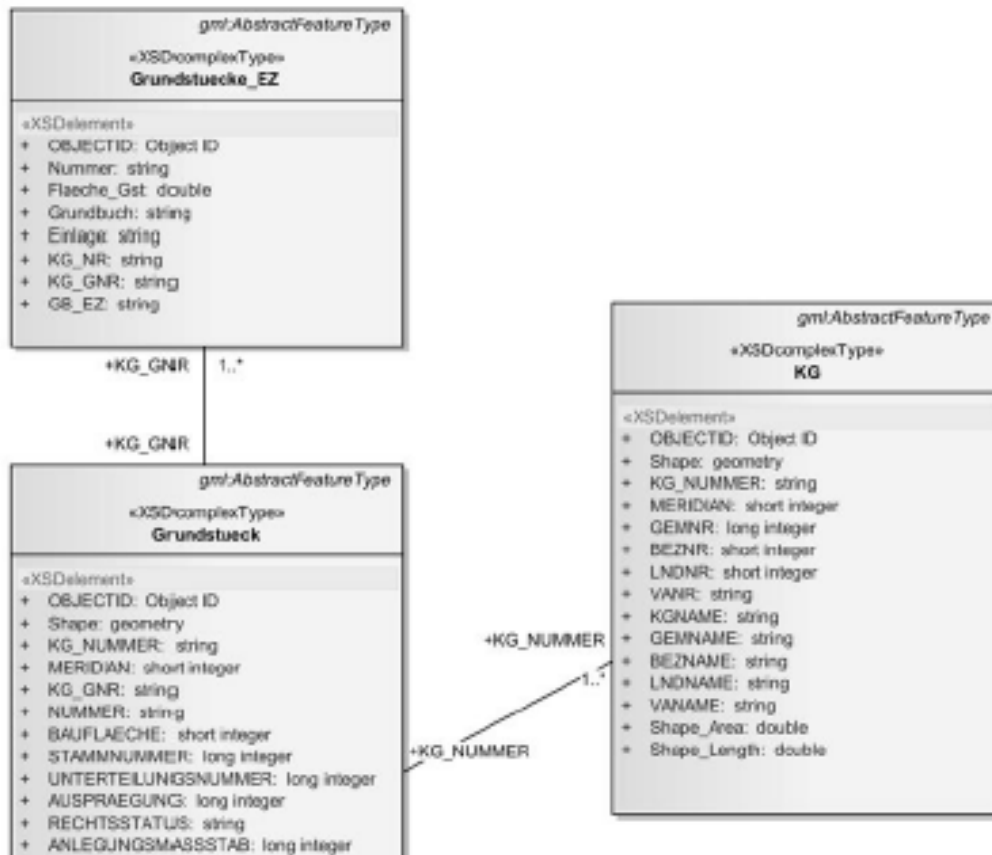
## 3. Central storage of DKM

- DXF- Files (only for internal process) and Shape-files
- Update of central Real Estate Data Base
- Real Estate Database and database for e- geodata Austria (access to all data of BEV via internet)

# Digitale Katastermappe (DKM)



# UML- Model



# Cadastral Parcel: INSPIRE <> DKM

- Comparison of INSPIRE Data Specification on Cadastral Parcels with Data Model of Digital cadastral Map (DKM)
- Spatial attribute and linkage
- M...mandatory ✓ ...existing
- V... voidable ✗ ...not existing

# INSPIRE <> DKM: cadastral boundary

INSPIRE Elemente	DKM Element	M/V	Bestand
administrativeUnit	GEMNR	V	✓
areaValue	Flaeche_Gst	V	✓
beginLifespanVersion	x	V	x
endLifespanVersion	x	V	x
inspireID	GB_EZ	M	x
nationalCadastralReference	GB_EZ	M	✓
validFrom	x	V	x
validTo	x	V	x

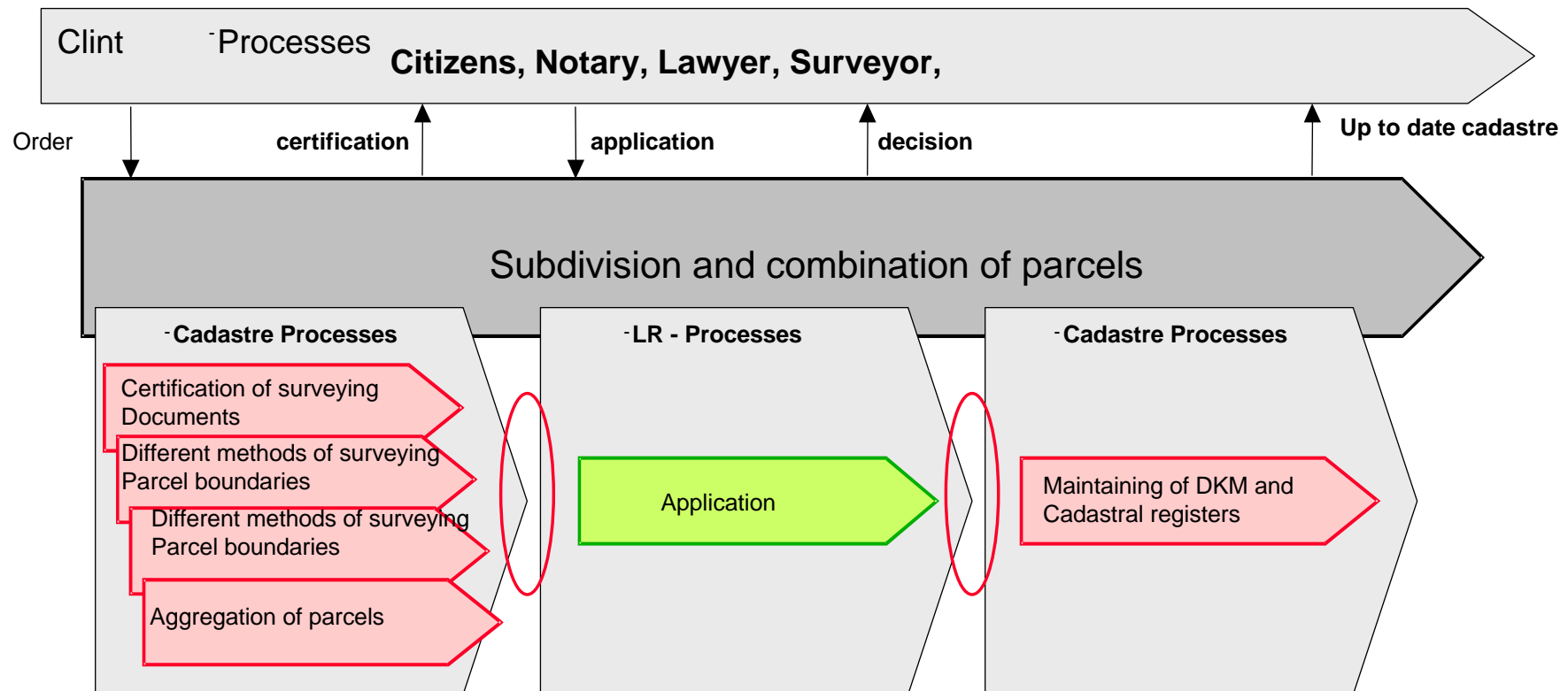
# INSPIRE <> DKM: cadastral parcel

INSPIRE Elemente	DKM Element	M/V	Bestand
administrativeUnit	GEMNR		✓
areaValue	Flaeche_GST	M	✓
basicPropertyUnit	GB_EZ	V	✓
beginLifespanVersion	x	V	x
endLifespanVersion	x	V	x
geometry	SurfaceProperty	M	✓
inspireID	KG_GNR	M	x
label	NUMMER	M	✓
nationalCadastralZoningReference	KG_GNR	M	✓
referencePoint	HOCHWERT_1 RECHTSWERT_1	V	✓
validFrom	x	V	x
validTo	x	V	x
zoning	KG_NUMMER	V	✓

# Conclusion, outlook

- Ongoing change of the data model for New Real Estate Database
- Joint project between BEV and MoJ to develop a new integrated system
  - Fully “digital” processes between Cadastre (cadastral offices) and Land Registry (local courts)
- Using open standards (OGC) Optimize internal processes
  - Standardizing of the system
  - Design of new processes for Cadastre and Land Registry

# The registration process



**Thank you for  
your attention !**

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