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# Digital Transformation *societal and organisational impact*

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Netherlands' Cadastre, Land Registry and Mapping Agency

FIG Commission 7 Annual Meeting; October 2-4, Deventer, The Netherlands



# 4000 years of (digital) transformation



Digitisation  
Digitalisation  
Transformation



Transaction Completed Successfully

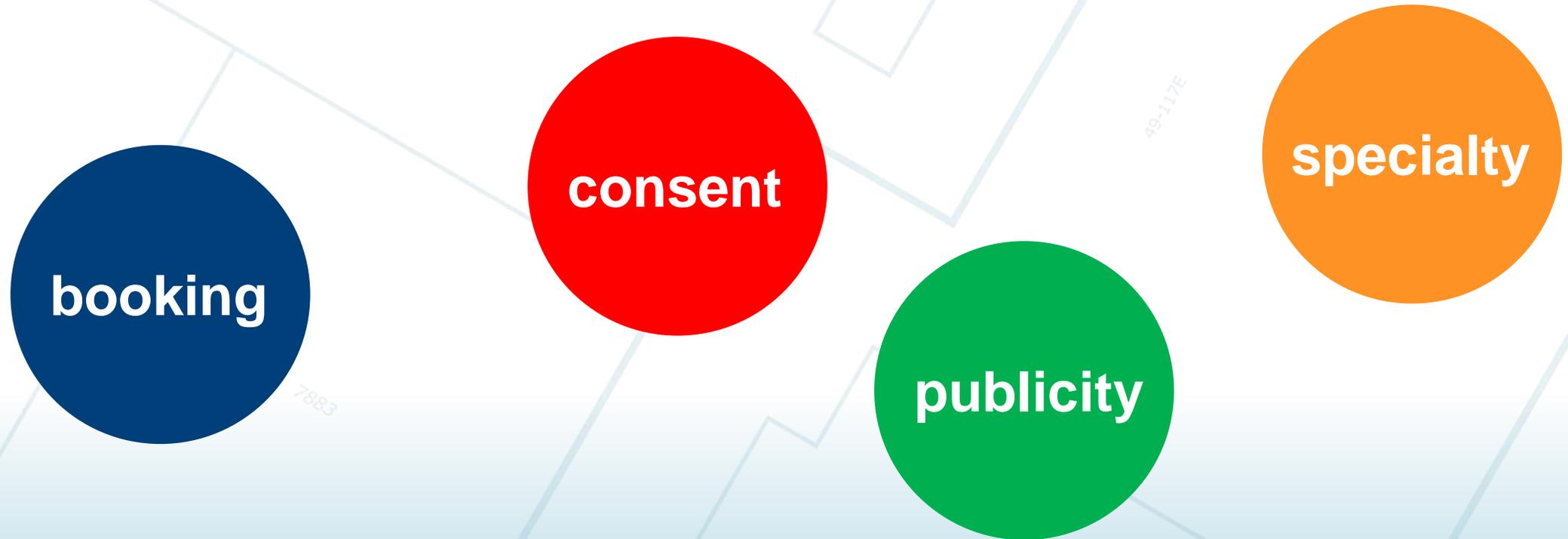


# Going digital; digitising our world (1)

## Setting the scene in 1995

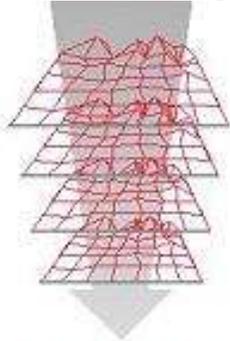
### *Basic legal principles of land registration systems*

*Henssen (FIG seminar modern cadastres and cadastral innovations)*





# Going digital; digitising our world (2)



**CADASTRE 2014**

A VISION FOR A FUTURE CADASTRAL SYSTEM

Jürg Kaufmann • Daniel Steudler  
with the Working Group 1 of FIG Commission 7



July 1998

## Looking forward in 1998; 6 statements *(Kaufmann and Steudler, Cadastre 2014)*

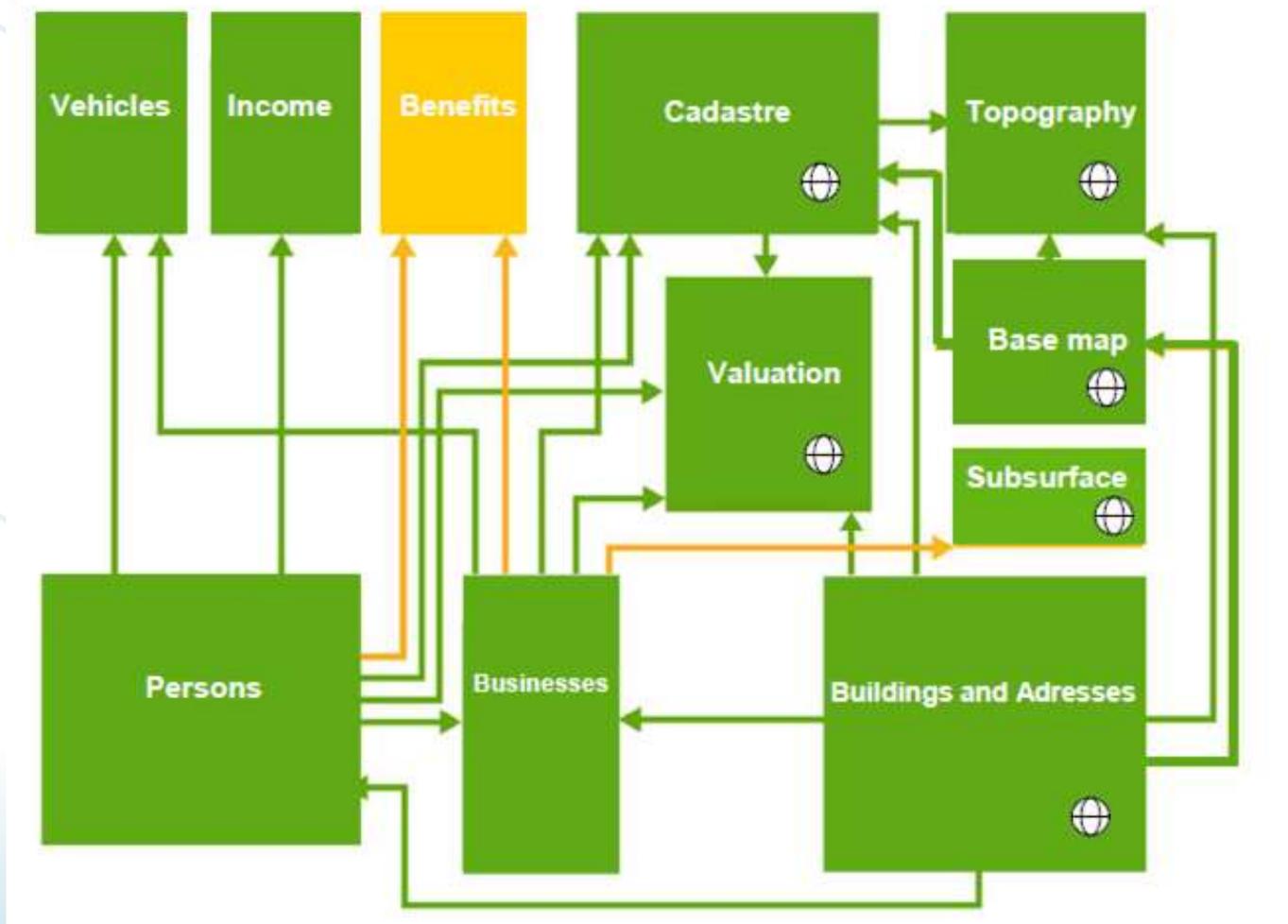
1. cadastre will show the complete legal situation
2. no separation between maps and registers
3. mapping will be dead: long live modelling
4. paper and pencil will be gone
5. cadastre will be highly privatized
6. cadastre will be cost recovering



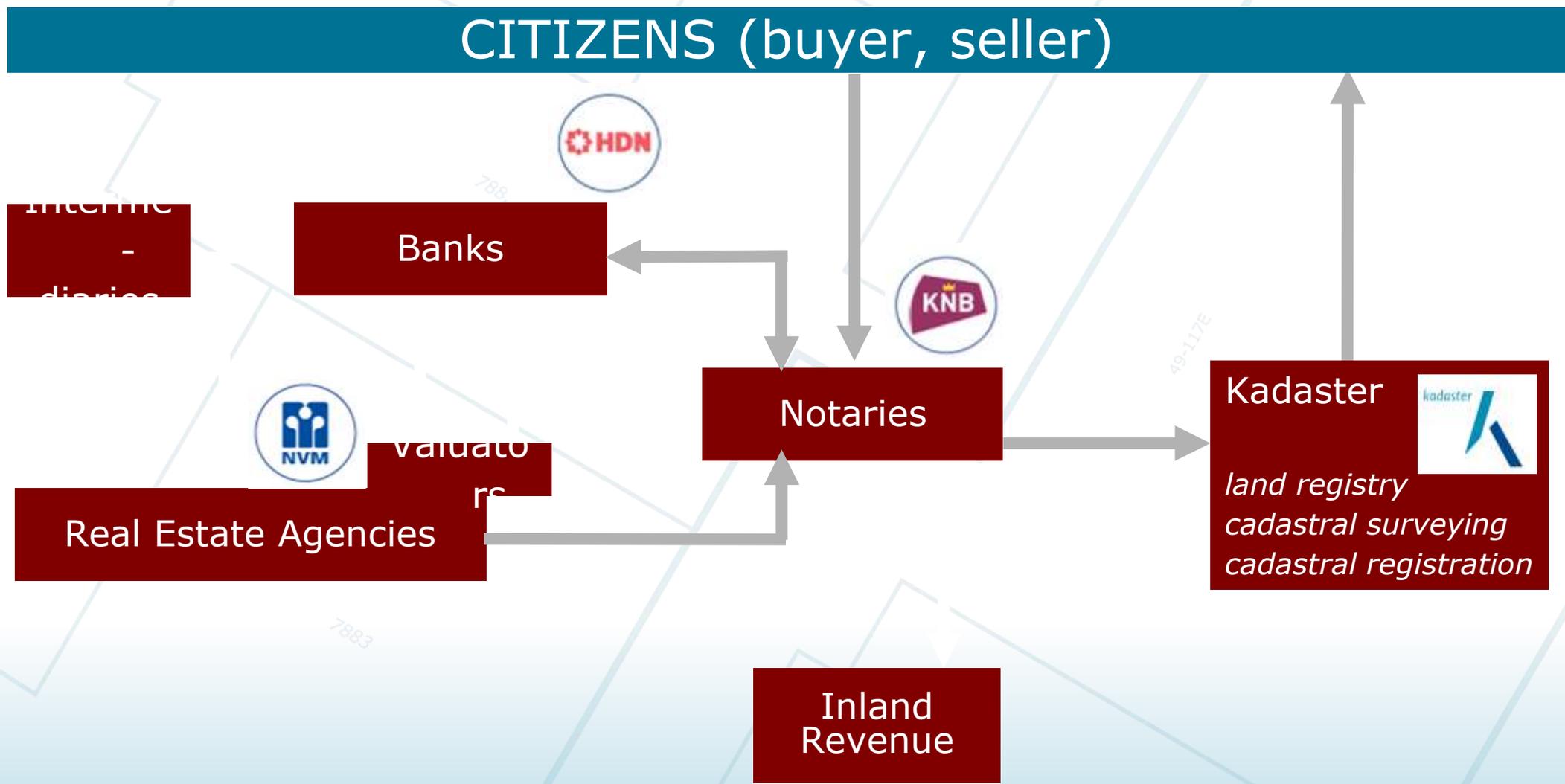
# Where has digitisation taken us in the Netherlands

Cadastral is part of the system of key registers

Concept of *authoritative data*

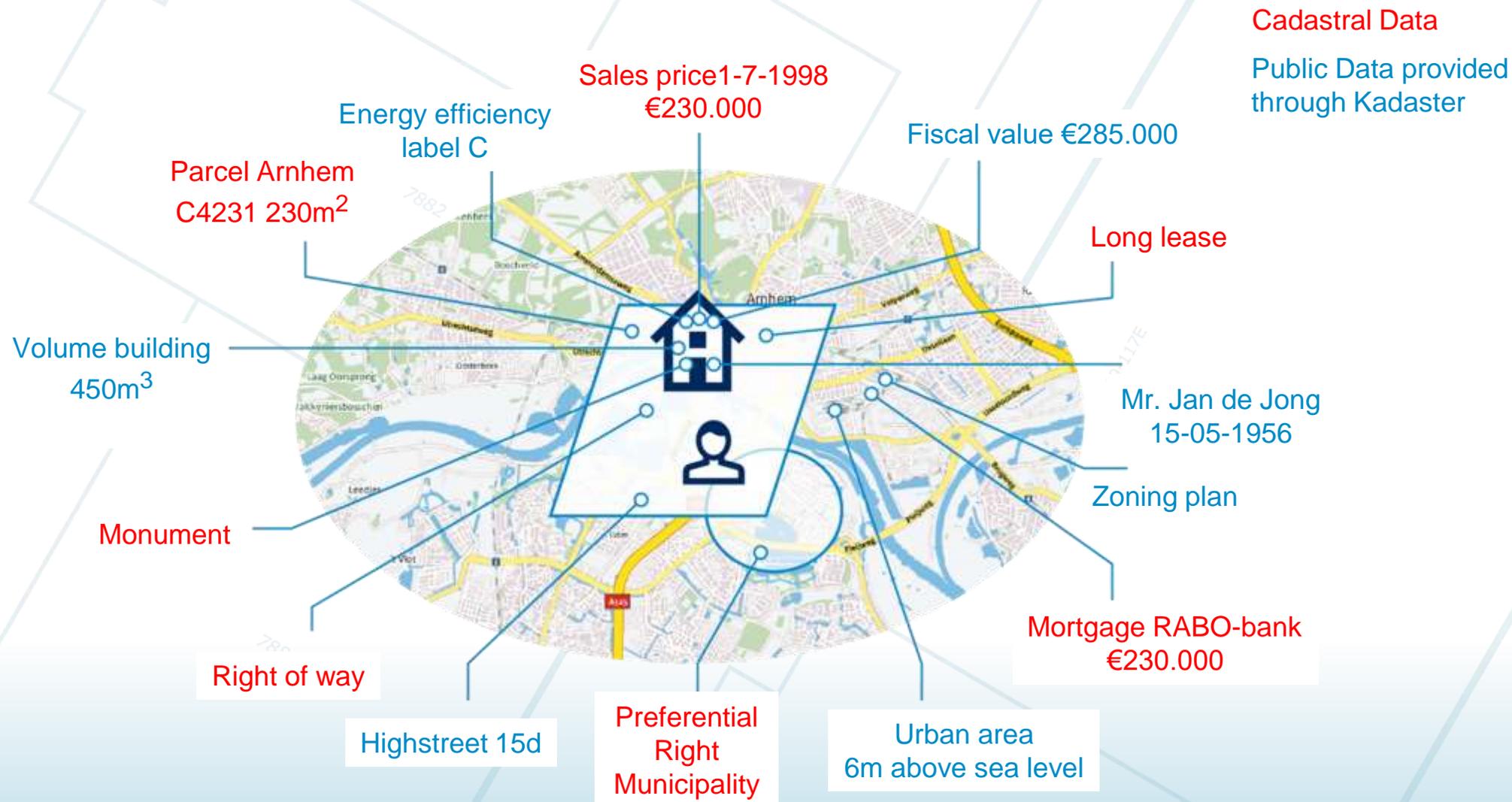


# Real estate transaction chain in the Netherlands





# A wealth of accessible information on real-estate



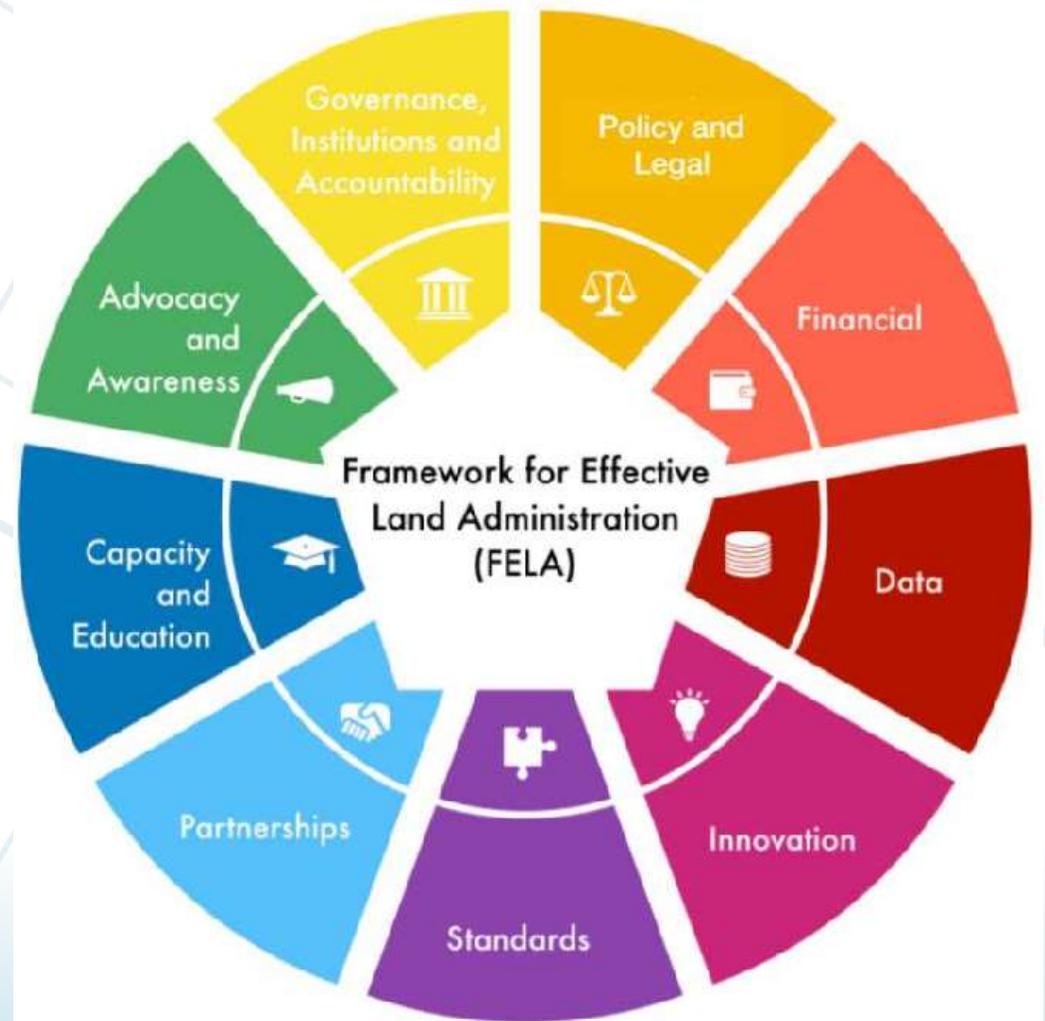


# Looking forward

FELA: 9 strategic pathways

Useful framework for setting up or improving a cadastral/LR-system.

What will be the impact on the ecosystem?





# Looking forward: Strategic Foresight Kadaster 2032

Declining **trust**  
in authority,  
politics and  
institutions



The **digital world** is  
increasingly  
prominent



Digitization  
contributes to  
**social  
divisions**



Importance of  
**(geo)information  
for societal  
issues** increases



**Cybercrime**



**EU** increasingly in  
the lead and  
control



## Large *societal* impact of digitalisation

# European Digital Rights and Principles



## People at the centre

Digital technologies should **protect people's rights, support democracy, and ensure that all digital players act responsibly and safely**. The EU promotes these values across the world.



## Freedom of choice

People should benefit from a **fair online environment, be safe from illegal and harmful content**, and be empowered when they interact with new and evolving technologies like artificial intelligence.



## Safety and security

The digital environment should be **safe and secure**. All users, from childhood to old age, should be empowered and protected.



## Solidarity and inclusion

Technology should **unite, not divide, people**. Everyone should have access to the internet, to digital skills, to digital public services and to fair working conditions.



## Participation

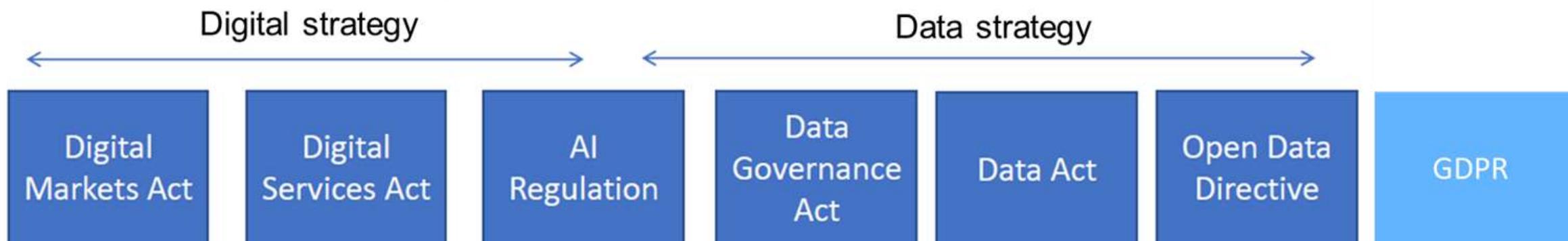
Citizens should be able to **engage in the democratic process** at all levels and have **control over their own data**.



## Sustainability

Digital devices should support **sustainability** and the **green transition**. People need to know about the environmental impact and energy consumption of their devices.

# Rules of the Game: Europe is setting the scene





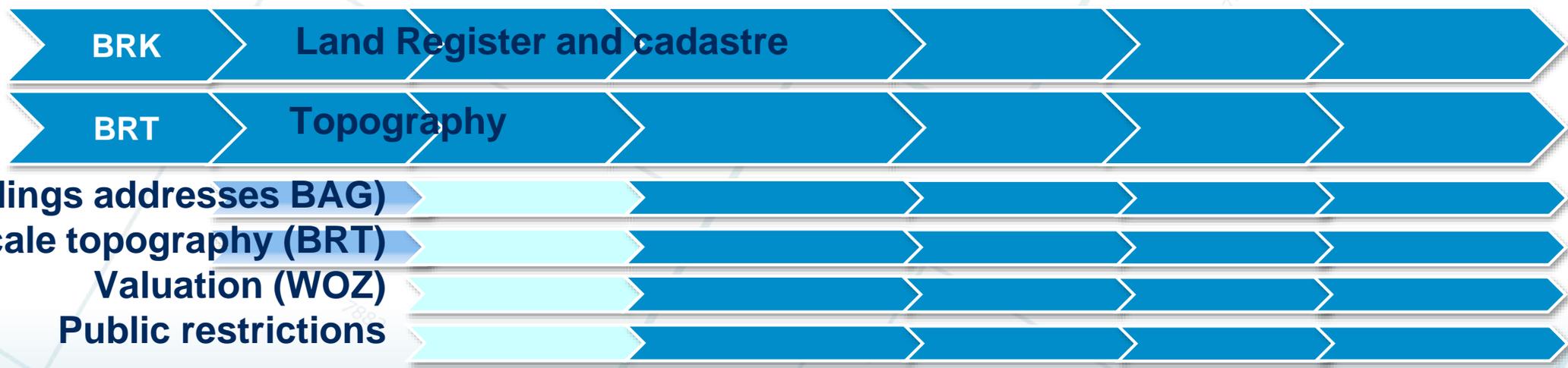
# Digitisation of our work processes

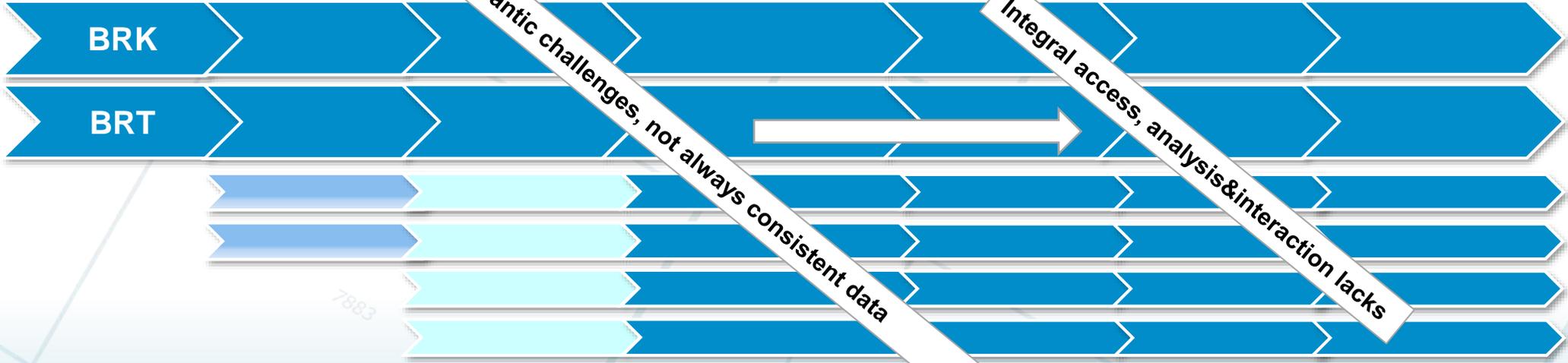
# Digitalisation of the organisation

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ldvu  
llen  
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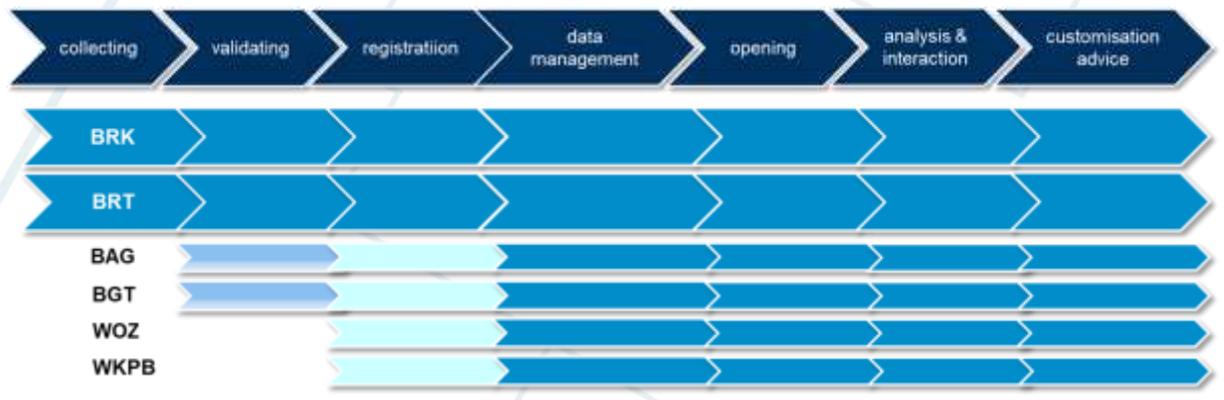
# Starting from the data chain for each process





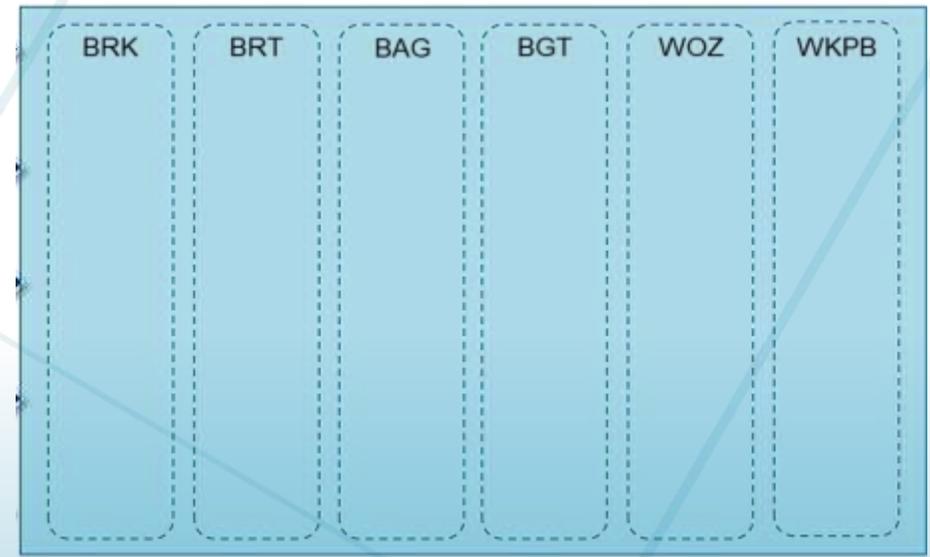


# Tilting the organisation

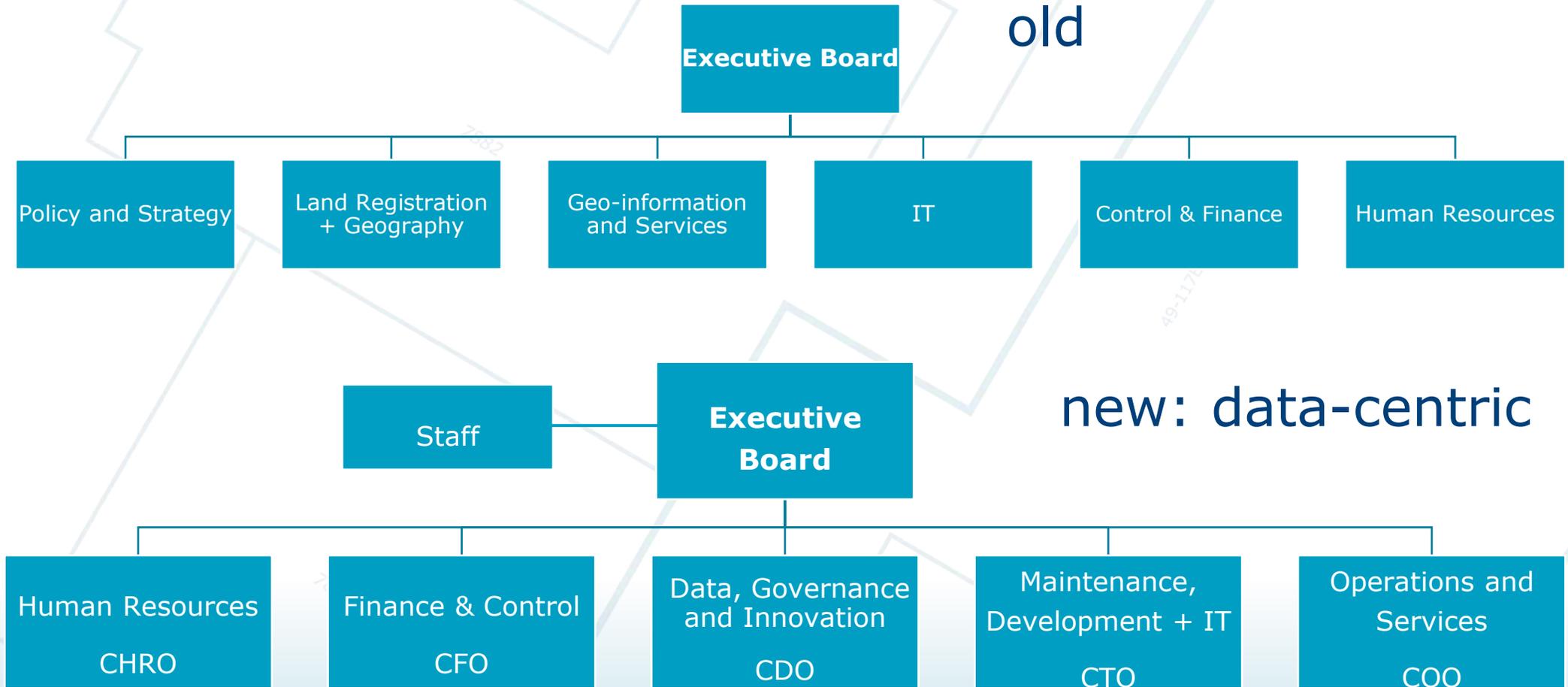


With attention to:

- Semantics
- Quality/transparency
- Steering on data
- Data at the source
- Etc.



# Organisational change; existing and new structure



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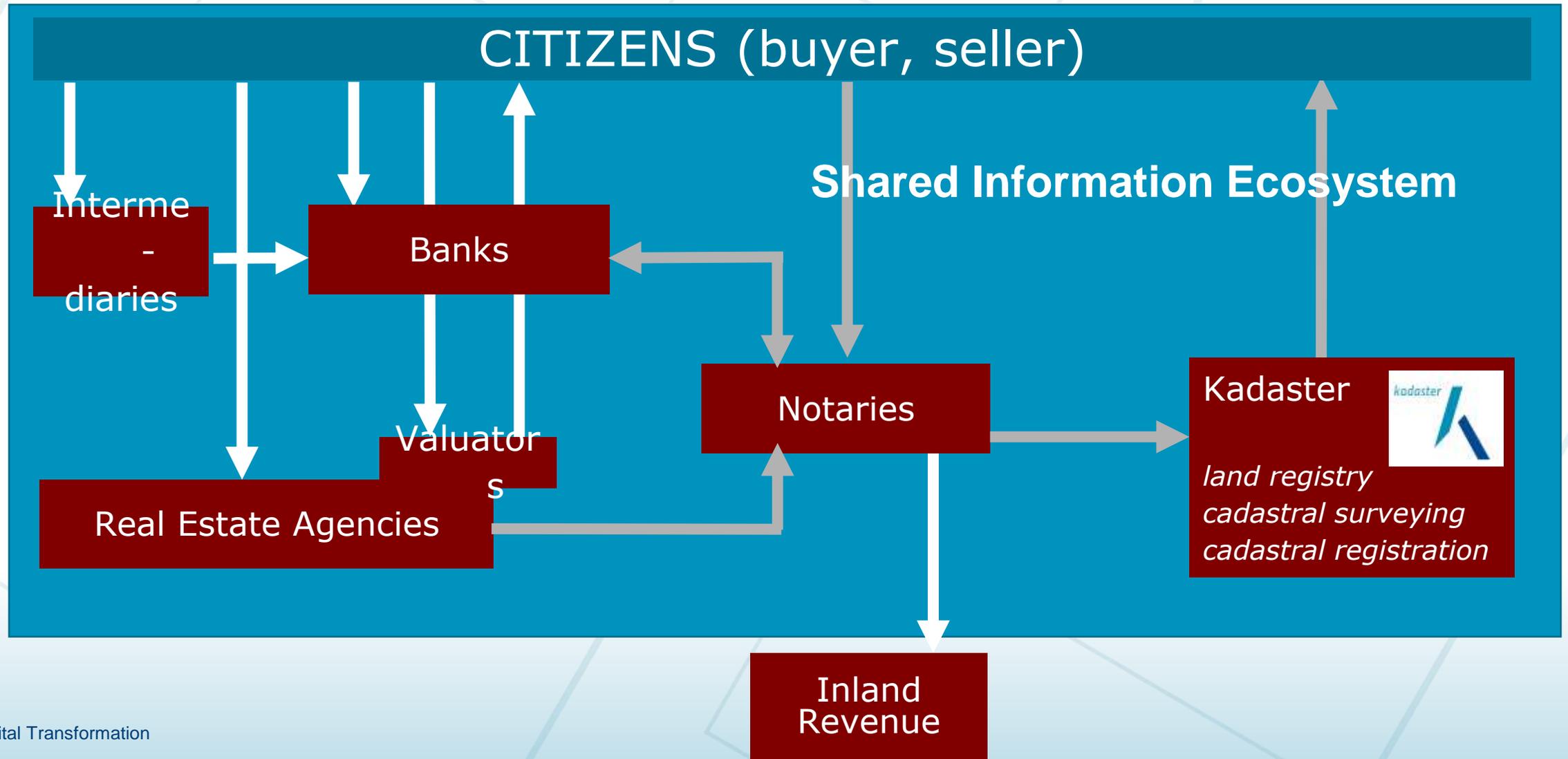
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# Setting up a real estate ecosystem

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# Towards 'carefree dealings in real estate'





# Guiding principles of the future ecosystem (largely in agreement with EU digital principles)

(legal) security at earlier stage



insight and overview



control of data



interoperability



security



By retrieving validated data directly from the source, we offer (legal) security at an earlier stage

Citizens and chain partners have insight into information and process and know what is expected of them

We enable the citizen and chain partners to actively control their data

The guiding principle is that the system of agreements is open to everyone and relies as much as possible on existing standards

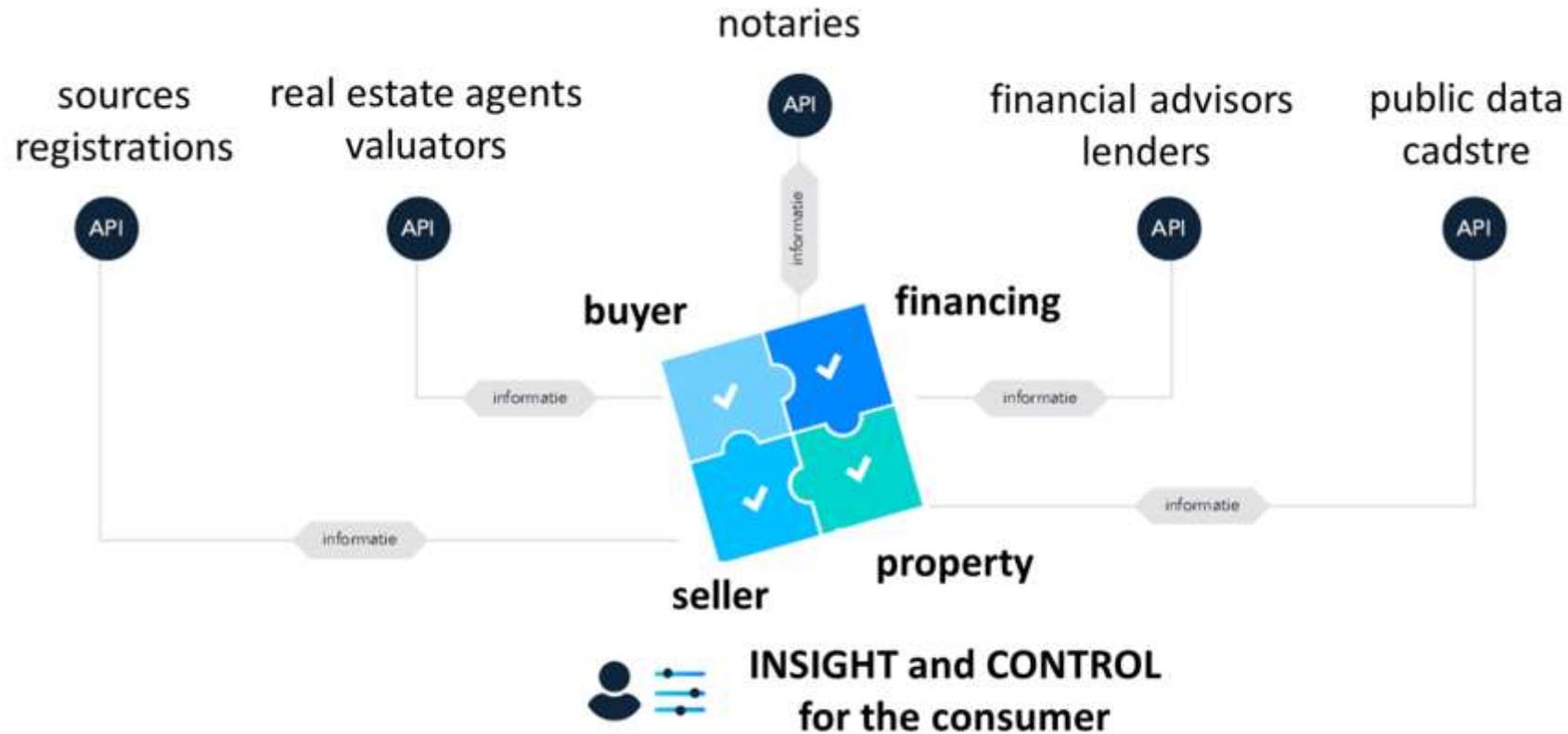
Information exchange only takes place at a high security level



- ✓ Buyer OK
- ✓ Seller OK
- ✓ Property OK
- ✓ Financing OK



# Resulting information eco-system for carefree dealings in real-estate



Focal points: legal and financial  
based on a shared trust framework



# Flemish information platform (Flemish Data Utility Company)



Focal point: opening public and cadastral information based on a public-private trust framework



# What about the basic legal principles?

Transformation from a system-centric to a rule-based approach

Cooperation between all parties based on trust frameworks

Controlled personal data spaces



Legal registers (less) open?  
Issues of security and privacy



# The use of cadastral/LR data in other domains

Cadastral/LR-data have many uses and serve many needs but in those cases will be an *part* of an other data-ecosystem





# European re-use of data: Open Maps for Europe

Cadastral Parcels, Buildings, Addresses are elements of the European High Value Datasets. Working towards an Open Cadastral Map

The screenshot displays a web application interface for EuroGeographics. On the left, a map shows cadastral parcels and buildings in red outlines. A vertical toolbar on the left side of the map includes navigation and tool icons, with the 'Identify Feature' icon highlighted by a red rectangle. On the right, a popup window titled 'Identify Feature' displays metadata for a selected parcel. The metadata includes:

- cadastral\_cadastralparcel.fid-5278166\_188710ca51d\_-25d9**
- gmLId**: CP.1591346202
- localId**: CP.1591346202
- namespace**: CZ-00026712-CUZK\_CP
- label**: IS2
- nationalcadastralreference**: 790389-192
- areavalue**: 5559.0
- areavalueuom**: m2
- beginlifespanversion**: 2022-05-20T07:16:20Z
- administrativeunit\_href**: [http://services.cuzk.cz/wfs/inspire-ou-wfs.asp?service=WFS&VERSION=2.0.0&request=GetFeature&storedQuery\\_Lid=um:ogc:def:query:OGC-WFS:GetFeatureById&id=AU.531995](http://services.cuzk.cz/wfs/inspire-ou-wfs.asp?service=WFS&VERSION=2.0.0&request=GetFeature&storedQuery_Lid=um:ogc:def:query:OGC-WFS:GetFeatureById&id=AU.531995)
- administrativeunit\_title**: Zaječov
- zoning\_href**: [http://services.cuzk.cz/wfs/inspire-cp-wfs.asp?service=WFS&VERSION=2.0.0&request=GetFeature&storedQuery\\_Lid=um:ogc:def:query:OGC-WFS:GetFeatureById&id=CZ.790389](http://services.cuzk.cz/wfs/inspire-cp-wfs.asp?service=WFS&VERSION=2.0.0&request=GetFeature&storedQuery_Lid=um:ogc:def:query:OGC-WFS:GetFeatureById&id=CZ.790389)
- zoning\_title**: Zaječov
- cadastral\_cadastralzoning.fid-56e7899b\_18871752e48\_-4cbc**

At the bottom of the popup is a 'Back to top' button. The map footer contains 'Copyright © 2023 EuroGeographics' and 'www.eurogeographics.org'. The EuroGeographics logo is visible in the top left and bottom right corners of the application area.



# Cadastral/Land Registry-data in other domains

Findable

OK

Accessible

API's, Data at the source

cadastral parcels HVD (open); LR: open access

Interoperable

Semantics, Currency

Re-usable

Partly

**Metadata**

**Semantic Interoperability**

**European Data Policies**

data governance act, data act, open data directive



# Concluding observations

- Transformation is permanent and surfaces incrementally
- Guiding principles remain valuable, but evolve
- Ecosystems work rule-based and are user/case driven
- Develop as follows: *rules* before *standards* before *services*
- Short term priorities: data access and data sharing (public and private)
- Cadastre and LR are increasingly embedded in (data-)ecosystems for addressing societal issues