

kadaster



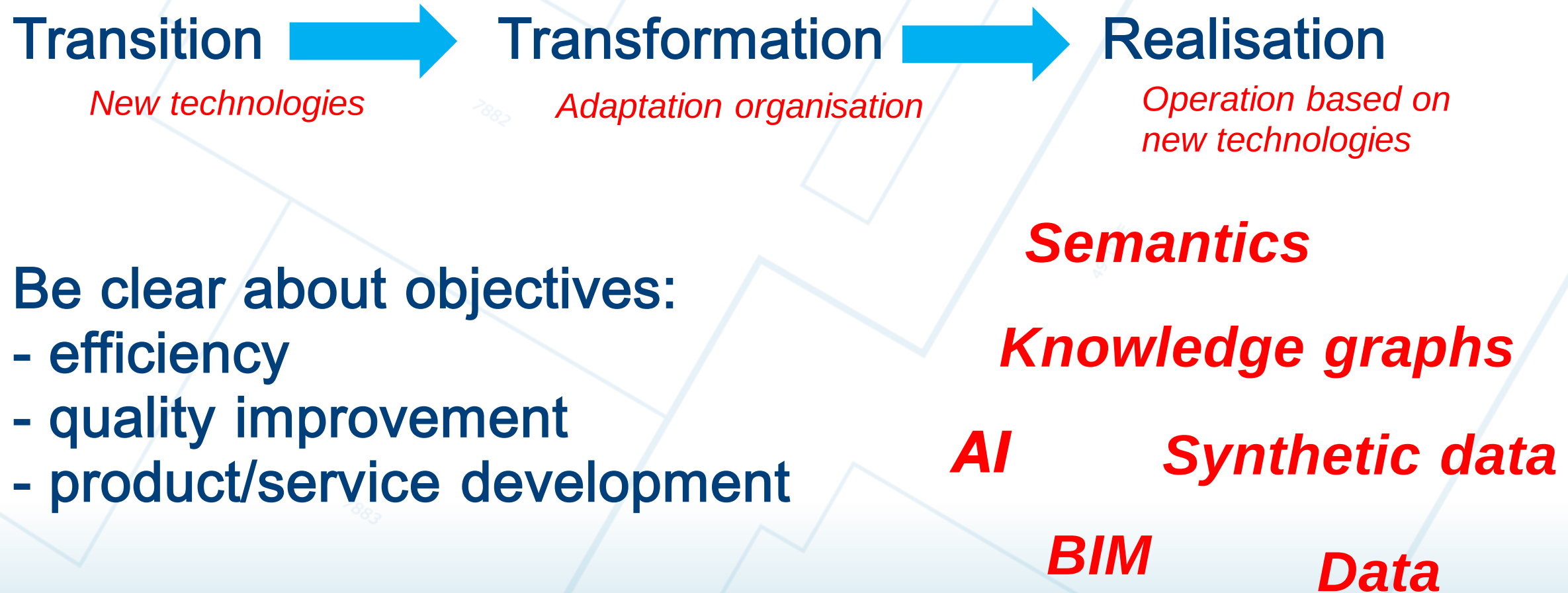
Organisational and Operational Impact of new Technologies in the Cadastral Domain

Martin Salzmann; strategy lead
Netherlands' Cadastre, Land Registry and Mapping Agency

Joint PCC-Eurogeographics Conference
New technologies in cadastre and future development directions
Warsaw, Poland, May 5-6, 2025



Implementing new digital technologies



Experience Kadaster; data at the centre

Transition → Transformation → Realisation

*Focus on **data**
less on processes/products*

*Kadaster data-centric
New organisation/governance*

*Data embedded and
source for value creation*



*New technologies require
new knowledge, new ways
of working, skills, user
interaction and
collaboration*

*New technologies offer
opportunities for new
services, quality
improvement and efficiency*



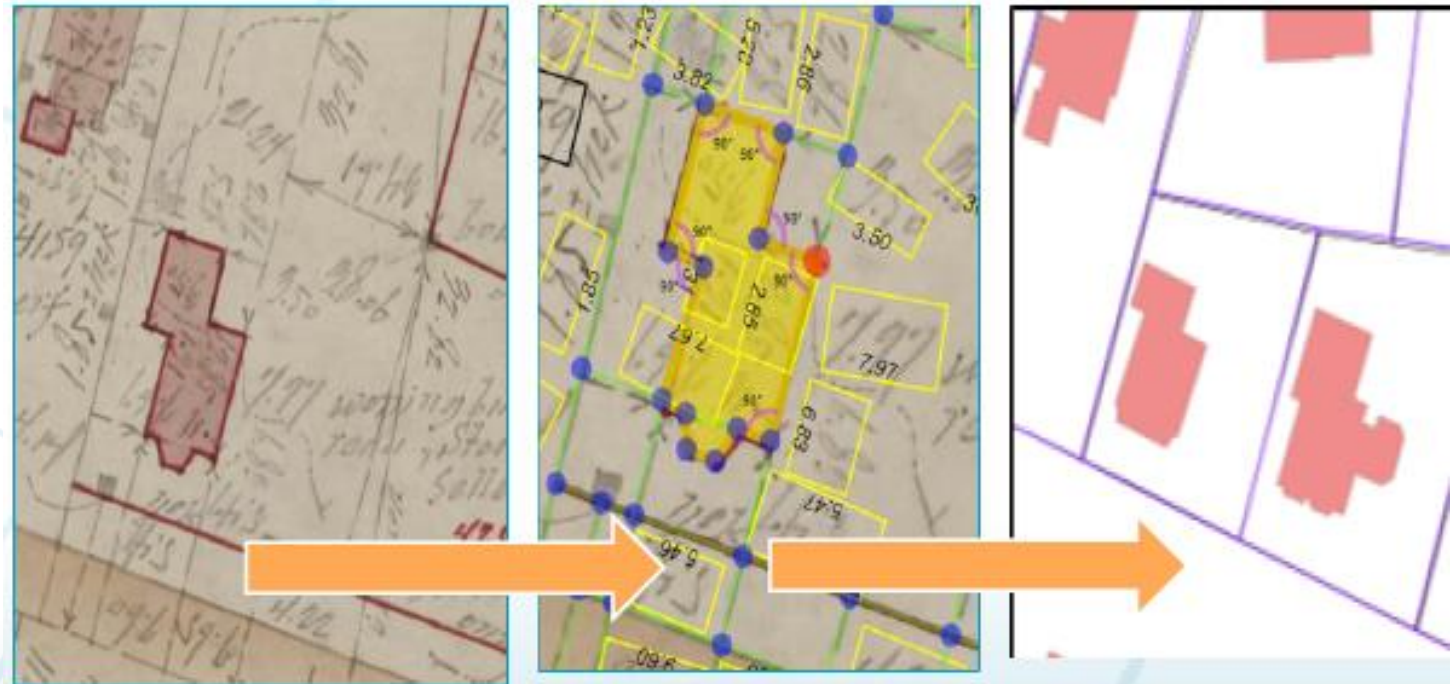
Renewal of the cadastral map

Using original measurements/fieldsheets as a foundation for rebuilding the cadastral map

Objective:

- quality improvement
- digitisation of measurement info
- **AI-based** solution

Preliminary step was to provide quality indicator for every boundary (done)







Extraction of essential elements from deeds in the registration process

Current operational process

Extract

- Buyer
- Seller
- Identification of property elements (parcel ,house)
- Legal facts

Efficiency and Quality Improvement

The screenshot displays the Kadaster TIA-stuk / vertoetsen web application. The left pane shows a scanned deed document with the following text:

De verschenen personen, handelend als gemeld, verklaarden:
KOOP
Verkoper en koper hebben op vijf oktober tweeduizend eenentwintig een koopovereenkomst gesloten met betrekking tot het hierna te vermelden registergoed.
Van de koopovereenkomst blijkt uit een onderhandse akte die hierna wordt aangeduid met "de koopovereenkomst".
LEVERING
Ter uitvoering van de koopovereenkomst levert verkoper hierbij aan koper, die hierbij aanvaardt:
OMSCHRIJVING REGISTERGOED
de eigendom van het perceel grond met woning en verdere aanhorigheden gelegen te **5424 CS Nijmegen, beekseweg 3**, kadastraal bekend gemeente **Hatert, sectie C, nummer 54** ter grootte van een are en achtenzestig centiare (1 a 68 ca), hierna te noemen: "het verkochte".
KOOPPRIJS
De koopprijs van het verkochte is: **vijfhonderdvierenvijftigduizend euro (€ 54.000,00)**.
WOONPLAATSKUZE
Terzake van de uitvoering van deze overeenkomst, waaronder tevens dient te worden begrepen de inschrijving in de openbare registers, alsmede voor de fiscale

The right pane shows the "Object wijzigen" form for "tia-stuk / vertoetsen / Hyp4 82469/117". The form includes the following fields:

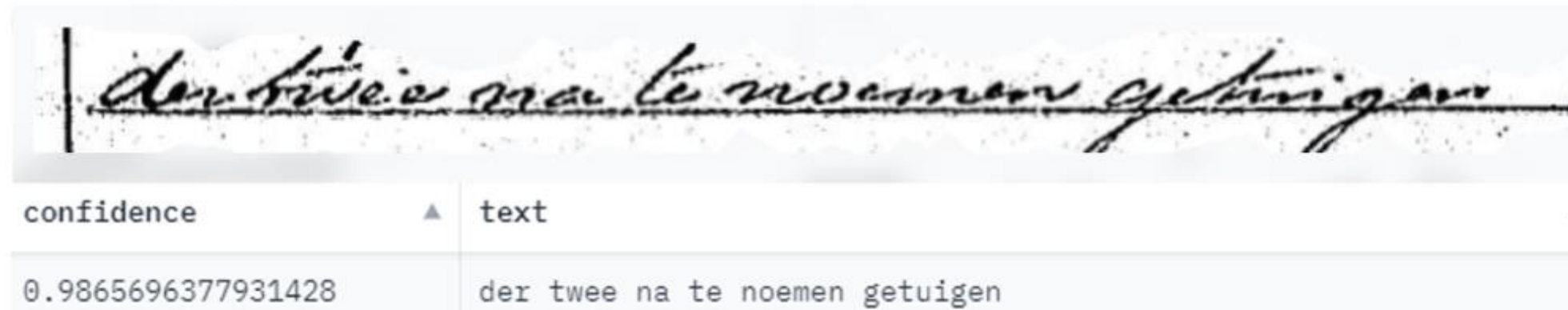
- Object type: Perceel
- Kadastrale aanduiding: Hatert, C
- Kadastrale grootte: 1 hectare, 68
- Omschrijving: de eigendom van het perceel grond met woning en verdere aanhorigheden gelegen te 5424 CS Nijmegen, beekseweg 3, kadastraal bekend gemeente Hatert, Sectie C, nummer 54 ter grootte van een are en achtenzestig centiare (1 a 68ca).
- Soort grens en grootte: (empty)
- Adres 1 of 2: Postcode/huisnummer 5424CS, 3, lot, toevoeging; Straatnaam/woonplaats Beekseweg, Nijmegen
- Buttons: Importeer adressen, +voeg adres toe, Terug naar overzicht, Object bewaren

At the bottom, it shows "Onroerende Zaken Hyp4 : 46969/177 01-11-2021 09:00".

Extraction of easements from handwritten deeds using AI

We have about 5 million handwritten deeds in our Land Register (1838-1950)

Can deeds made readable?
(*handwritten text recognition; HTR*)
Provide proper training material



confidence	text
0.9865696377931428	der twee na te noemen getuigen

Extraction of easements from handwritten deeds using AI

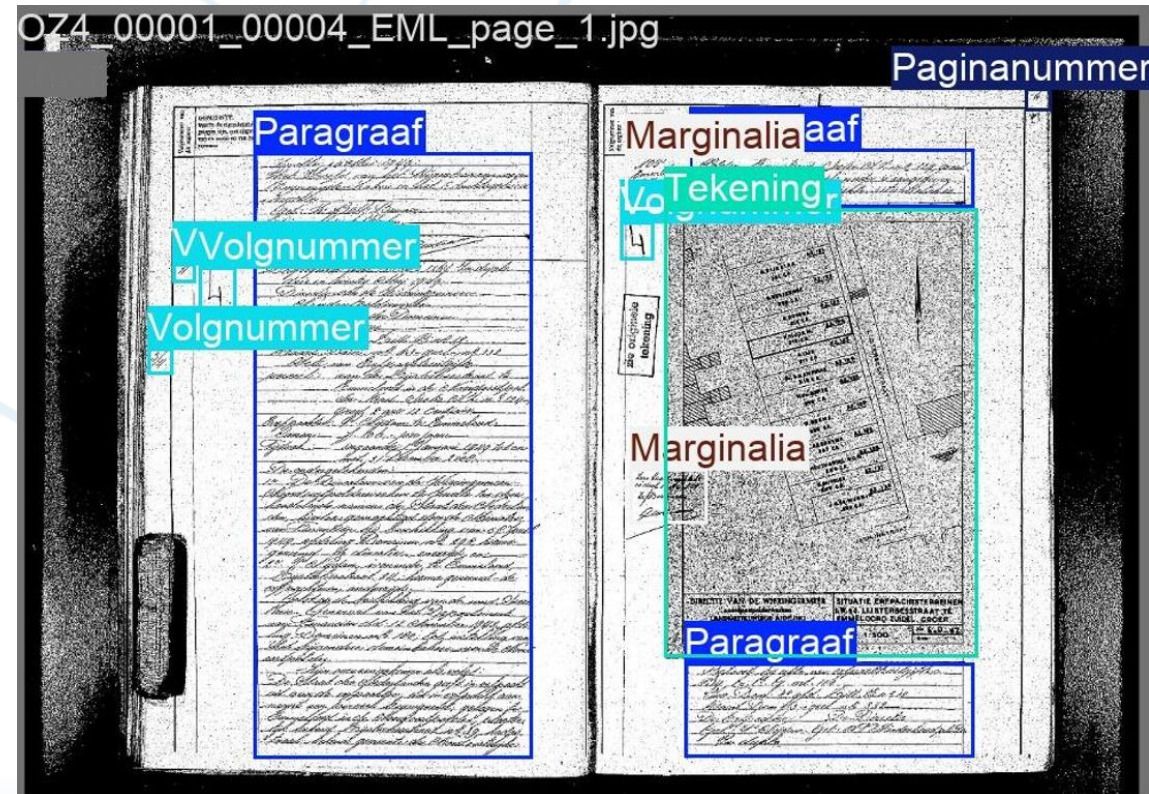
Can easements automatically be detected?

Identify various text sections and elements in the deed (e.g. page numbers, paragraphs).

Improves

- findability
- digital accessibility
- completeness of registration of rights
- eliminates manual search for easements

Note: quality is based on original quality and our registration accuracy (> 99,5%)



Registration of apartment rights: step by step approach

Linking up the built (BIM) environment with legal rights in 3D

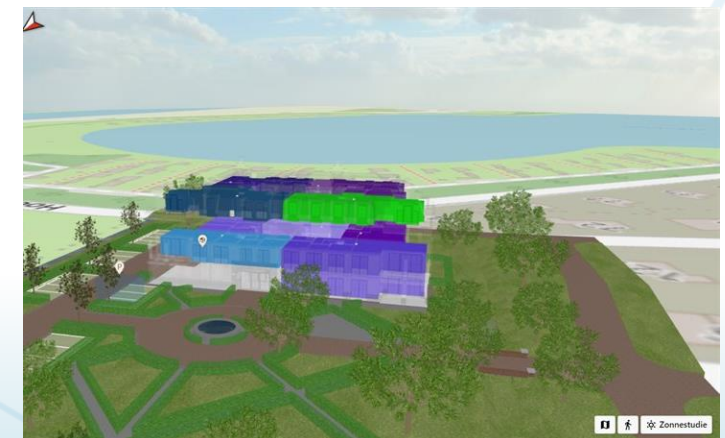
- Current registration is 2D (current legislation is 2D)
- Apartment rights are registered layer by layer
- Building and cadastral information is digitally available

How to register apartment rights in 3D?

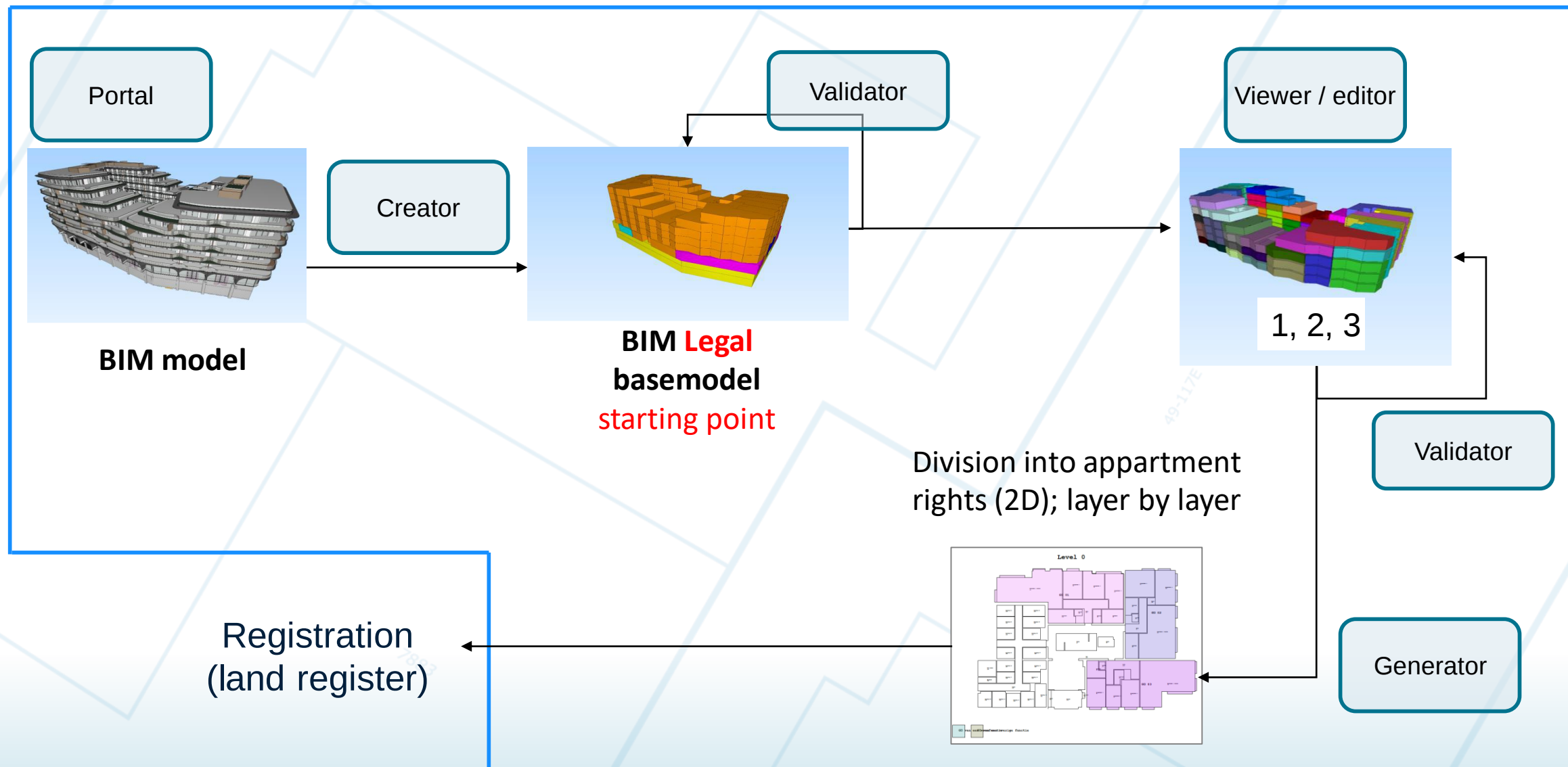
Step by step approach in working towards registering legally annotated BIM-models

Connecting the built and cadastral world

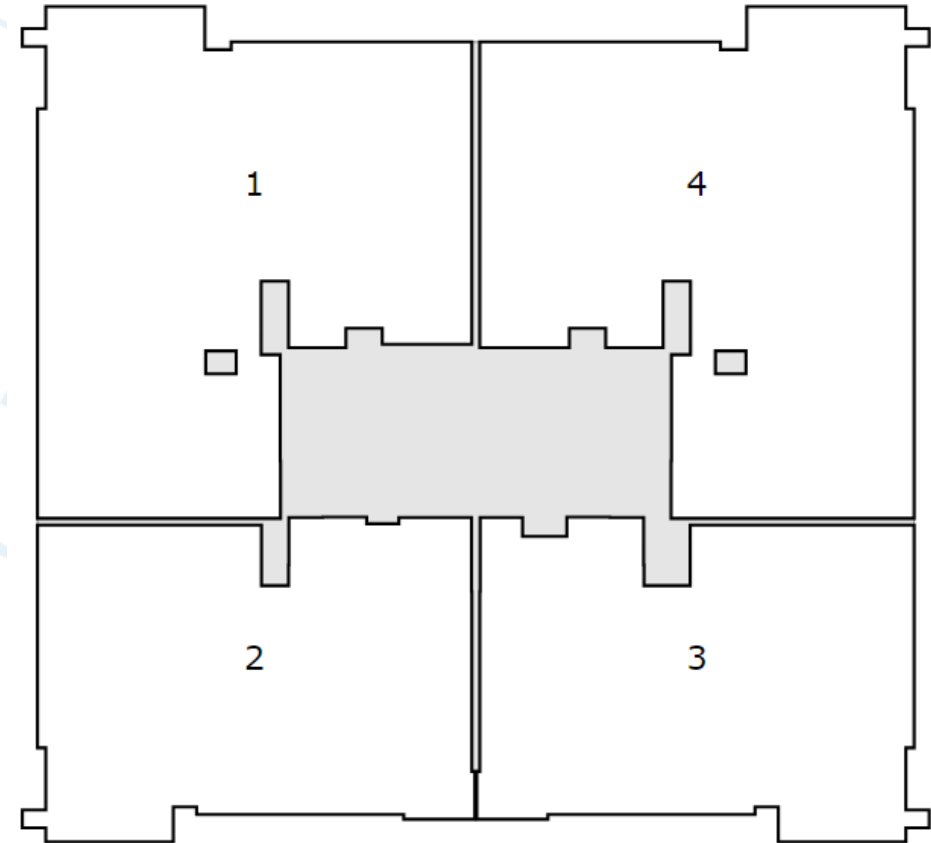
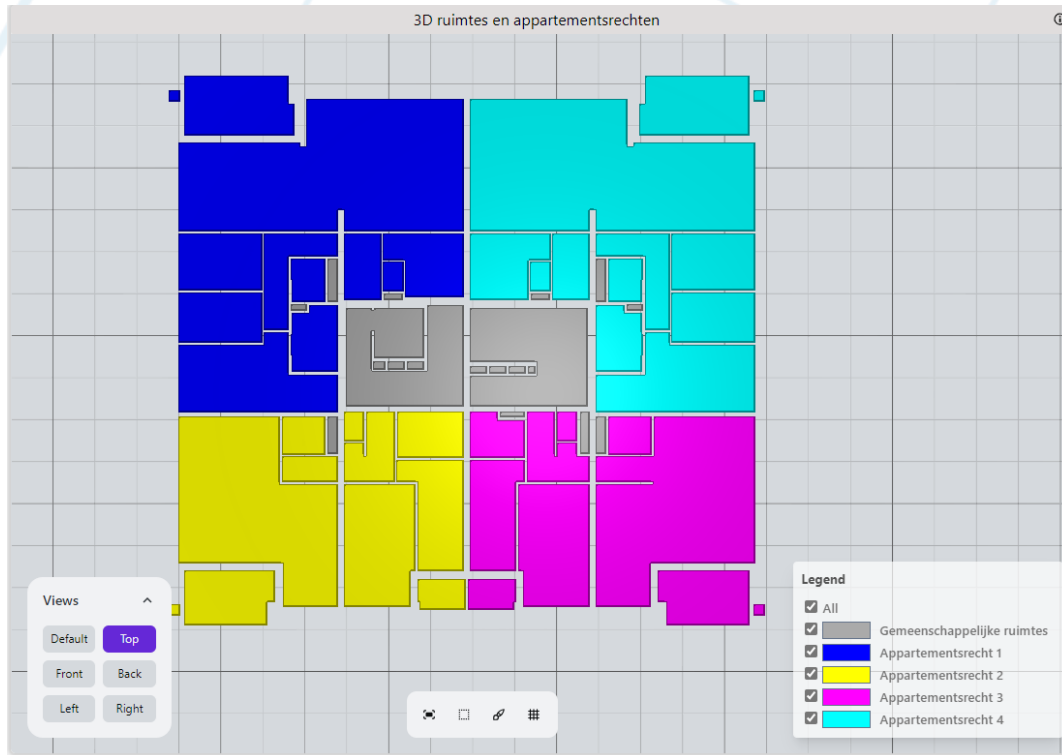
Merging the strength of 2 worlds



Current state of play



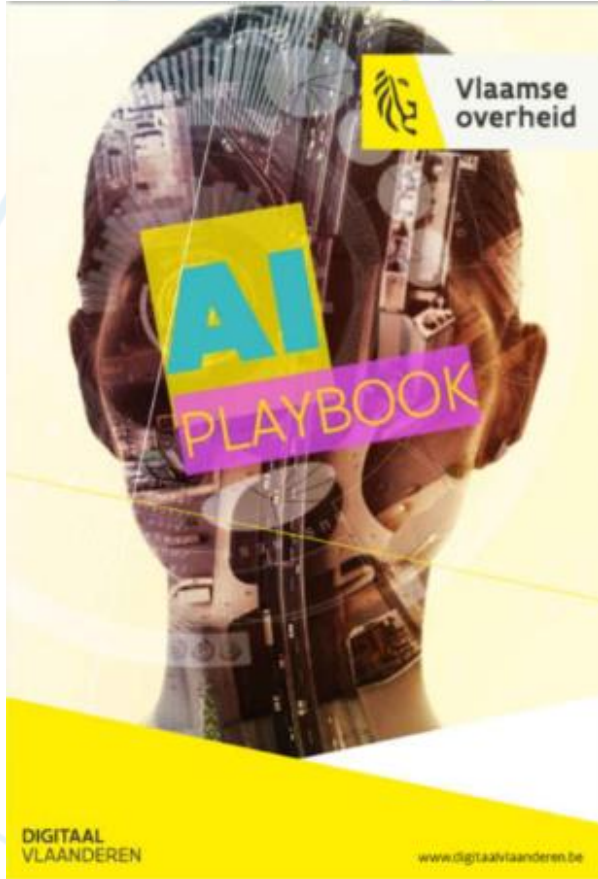
Automatic 2D-division into apartment rights



Parallel step: to what extent can we construct 3D legal information from division floor plans?
(reverse engineering)



Organisational aspects; implementing AI



1. Vision and strategy
ambitions, objectives, Key Performance Indicators
2. Innovation
use cases, prioritise, execute, productivity gains, learn
3. Reliable AI
AI-act, risk and control framework, ethical charter, guidelines
4. People and organization
*inspire, motivate, stimulate, training and support
change management, redesign: roles, processes, responsibilities*
5. AI-architecture
efficiency, cost, optimize use of data and infrastructure

<https://www.vlaanderen.be/digitaal-vlaanderen/onze-diensten-en-platformen/ai-expertisecentrum/het-ai-playbook> (in Dutch)



Implementing AI; lessons learned

Your AI is as good as your data!

Know and share (and if necessary improve) the quality of your data

Define and document the meaning of your data (semantics)

Publish what you do and how you do it (e.g. *Algoritmes.overheid.nl*)

Start with application of AI in your primary processes

You are the custodian of cadastral and LR knowledge, processes and data

This is essential for training and tuning your AI-application; that takes time!

Keep the human in the Land Administr^Ation loop

Take organisational, operational, ethical and stakeholder impact into account

Concluding remarks

Technology transforms the ways we innovate (learn), operate and collaborate (across sectors)

Cherish and acknowledge your foundation (starting point)

Transformation requires focus (shared objectives) and effort

Build on the (known) quality of your data and processes

