



The **Council** of European Geodetic Surveyors  
**Comité de Liaison des Géomètres Européens**

# Vision 2030 Challenge of the Surveyor

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# Introduction

Where are we now?

Where are we going?

Utopia: Chances of changes

Dystopia: Risks of changes





# Where are we now?

Using:

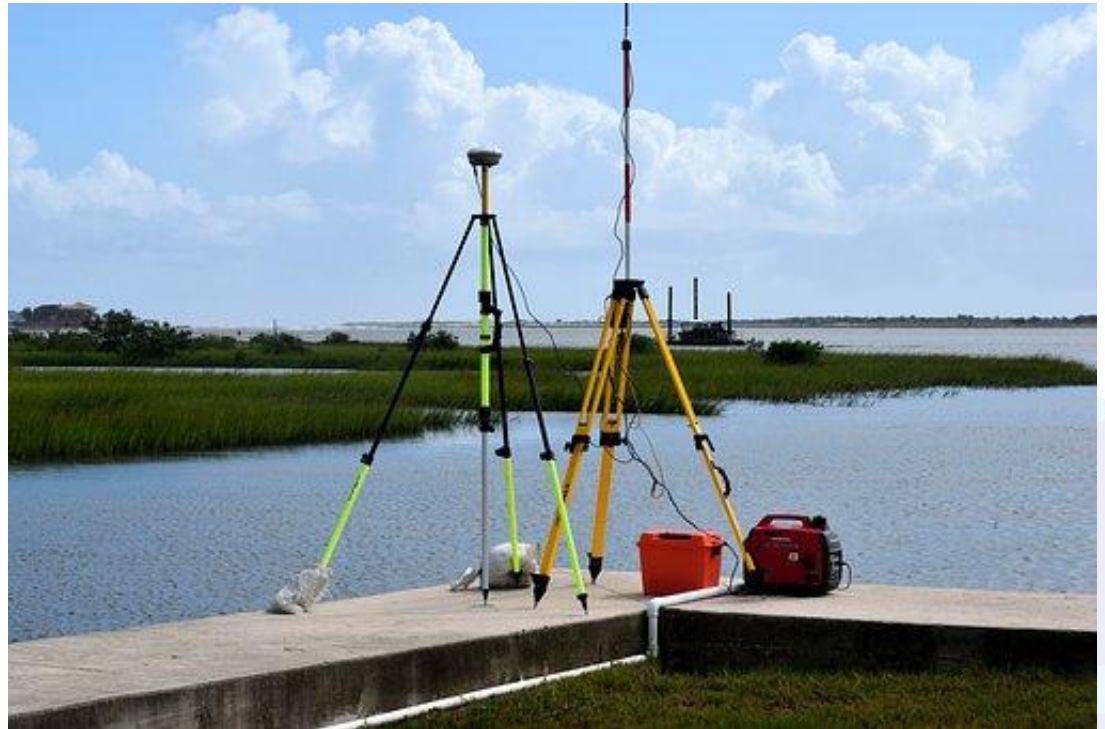
- Total stations
- GNSS
- Drones
- Scanners
- Laser
- Photos





# Working for:

- Cadastre
- Construction
- Site plans
- Mapping
- BIM
- Infrastructure



Quelle: Pixabay



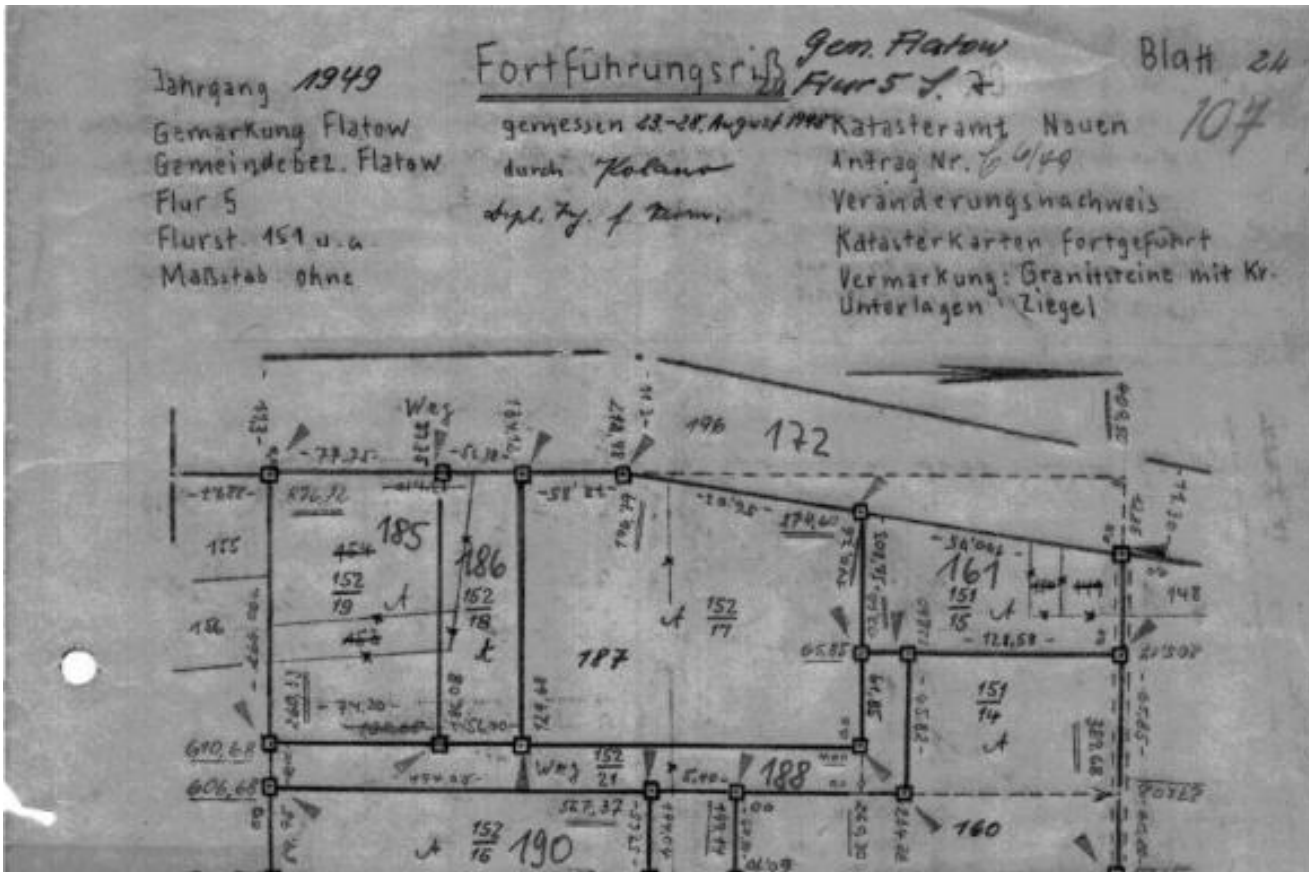
# Modern methods





# e.g. cadastre

## Working with old sketches





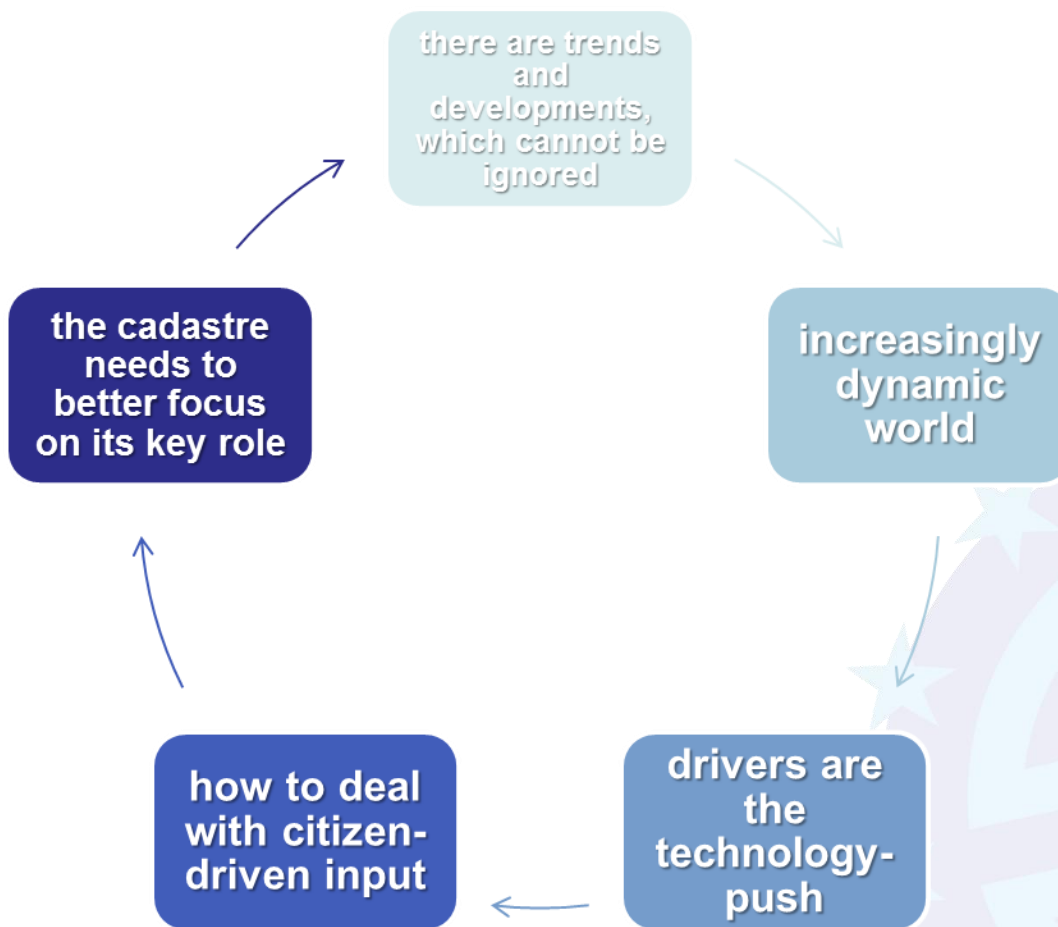
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# Where are we going?







# Where are we going?

- Crowdsourcing...where are the limits?
- Can new technologies like blockchains replace the legal system?
- Will the cadaster be always in the center of the GI?





# Evolution of data

- Linked data
- Block chain
- Internet of things
- Big Data
- Data mining
- Open  
& Voluntary data





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# Surveyors digitize the world

**GEODÄTEN**  
Wir digitalisieren die Welt.

Präzision.  
Expertise.  
Geodäten.

IGG **GEODÄSIE**   **VDV**

[www.IG-Geodasie.de](http://www.IG-Geodasie.de) 





# Digitisation

- Surveyors as digital pioneers are working with digital data since at least 30 years
- In Germany cadastral maps are digital, which means that boundaries and limiting points are digital. Unfortunately they don't always show the legal boundaries
- Point clouds are well known but still not common at everybody's work



# Internet of Things



Quelle: Pixabay

- How do surveyors use the Internet of Things



# BIM



- Working with BIM will change the surveyors mindset in means of planning and standardisation

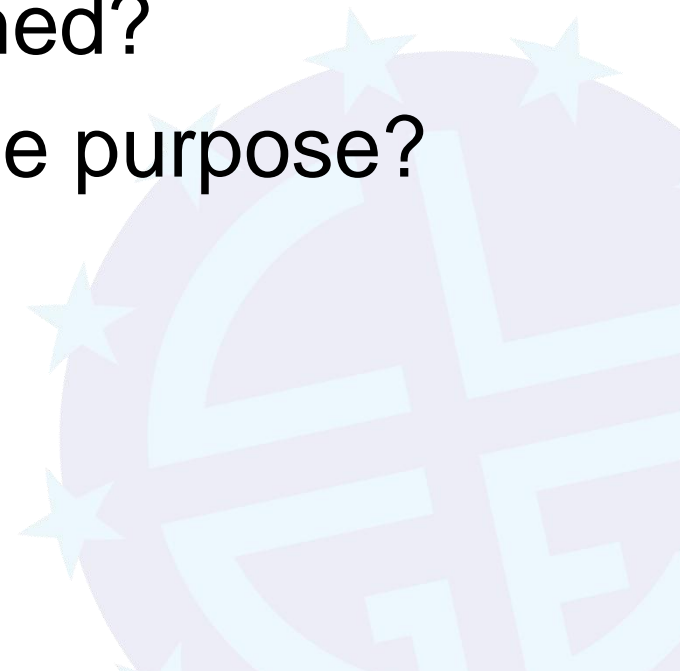
Quelle: Pixabay





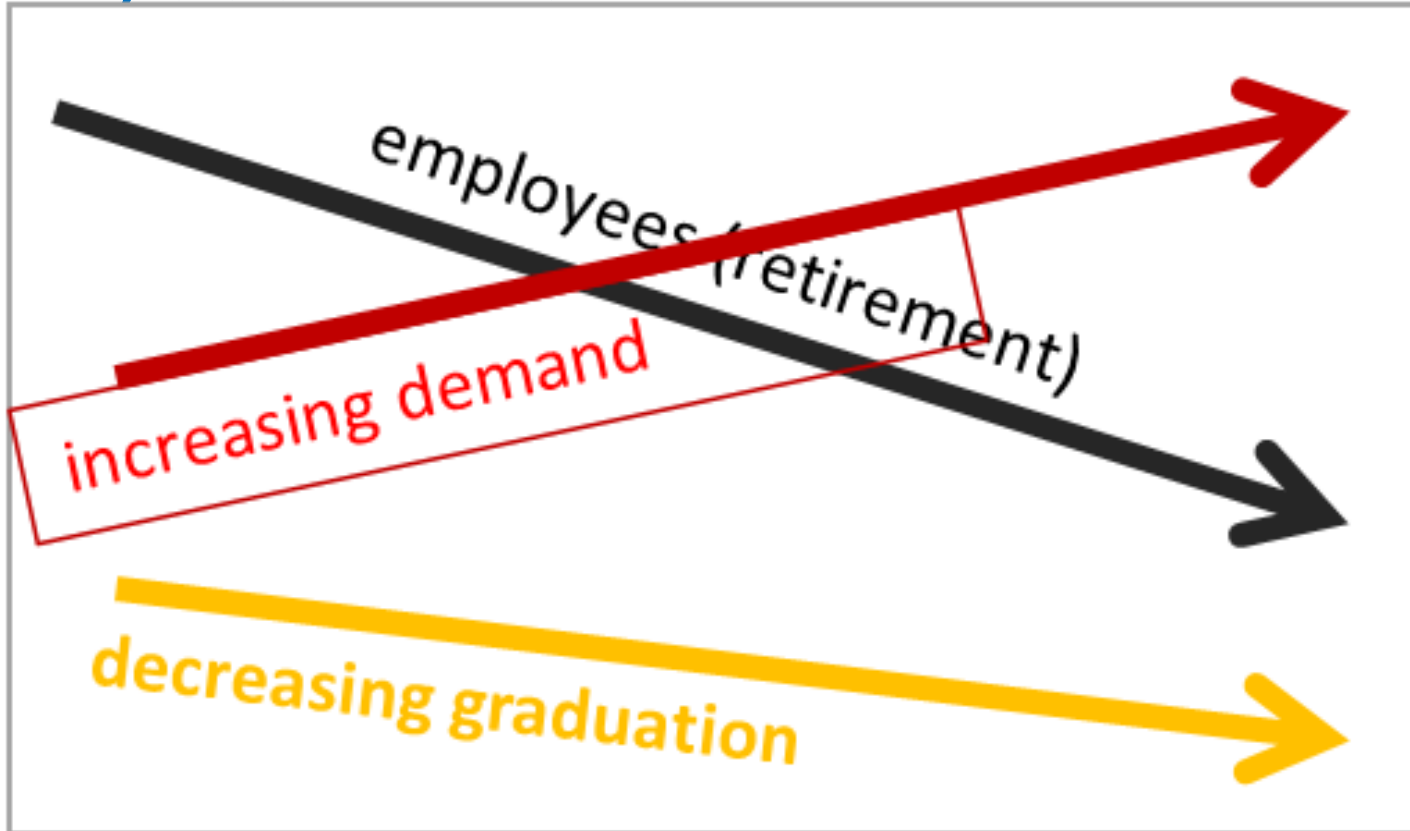
# Big Data

- What do surveyors do with the huge amount of data they collect? Especially the point clouds
- Should the data be published?
- Analysed for more than one purpose?





Employment: Situation in Germany:  
over the next decade about 50% of all  
employees will retire







# Education

- E.g. Germany:  
decreasing number of professional surveyors
- How can we gain youngsters and show that our profession is more interesting than anybody expects?
- Must we promote them abroad?
- Can we keep the requirements of the Code of Professional Qualification or must we reduce them?



# Education

On the other hand:

- Is there a need for surveyors with easier maintenance of instruments and software?

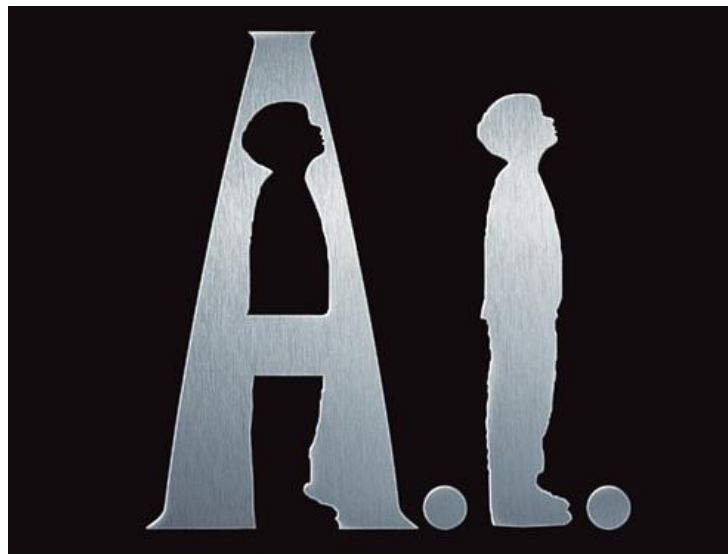




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# The surveyor tomorrow?





# Will a robot take my job?

WILL ROBOTS TAKE MY JOB?

4%

Lawyers

SOC CODE: 23-1011

WILL ROBOTS TAKE MY JOB?

4%

Political Scientists

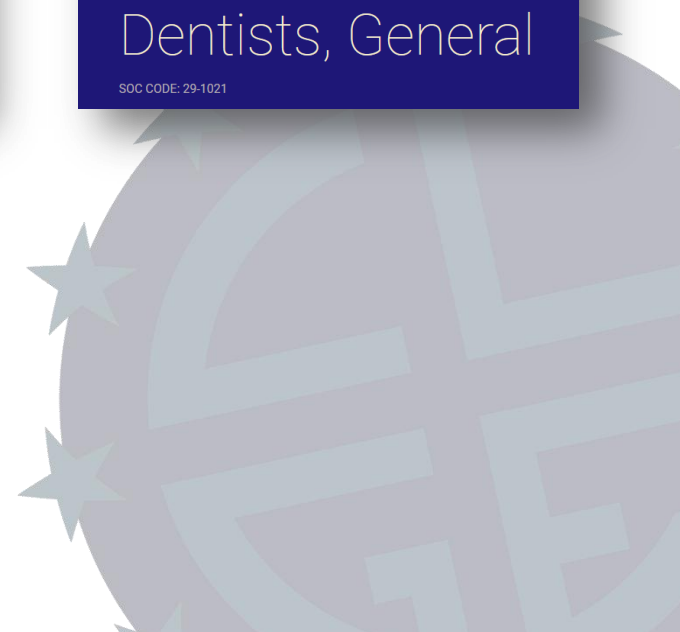
SOC CODE: 19-3094

WILL ROBOTS TAKE MY JOB?

0%

Dentists, General

SOC CODE: 29-1021





# Will a robot take my job?

geodesist

Geoscientists, Except Hydrologists and Geographers	<b>63%</b>	SOC CODE: 19-2042
Surveyors	<b>38%</b>	SOC CODE: 17-1022
Hydrologists	<b>01%</b>	SOC CODE: 19-2043
Cartographers and Photogrammetrists	<b>88%</b>	SOC CODE: 17-1021
Mining and Geological Engineers, Including Mining Safety Engineers	<b>14%</b>	SOC CODE: 17-2151
Jewelers and Precious Stone and Metal Workers		SOC CODE: 51-9071
Civil Engineers	<b>02%</b>	SOC CODE: 17-2051



# Will a robot take my job?

WILL ROBOTS TAKE MY JOB?

4%

Lawyers

SOC CODE: 23-1011

WILL ROBOTS TAKE MY JOB?

2%

Civil Engineers

SOC CODE: 17-2051



# Mapping

- Towards a new dynamic dimension of the maps
- Virtual reality

The parcel as the nucleus of every real representation





# Mapping

- Belongs the future to free software like Open Street Map?



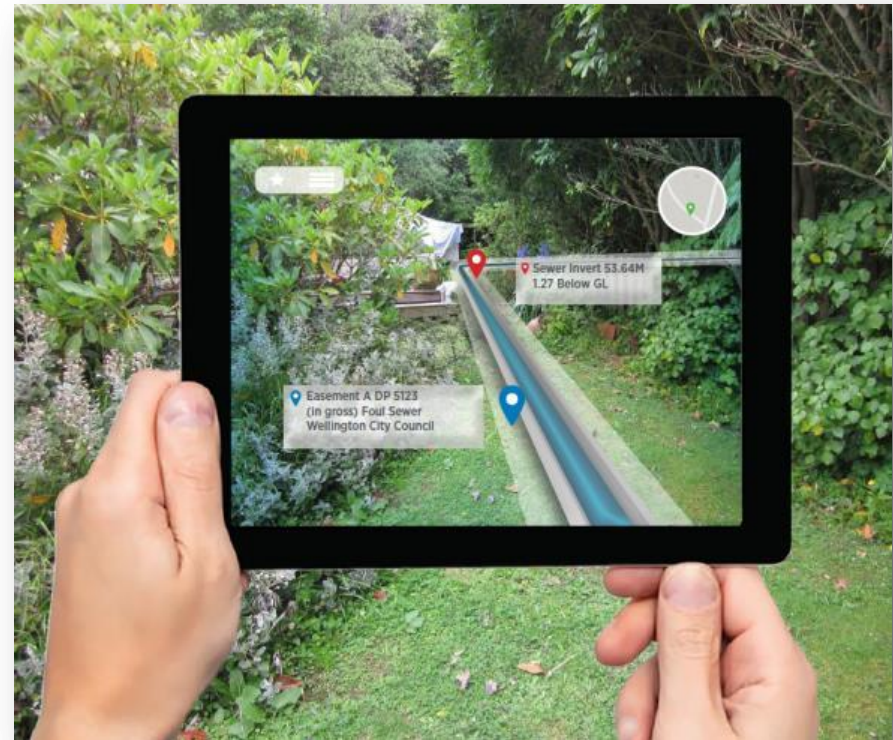




# Evolution of cadastre

- Augmented reality

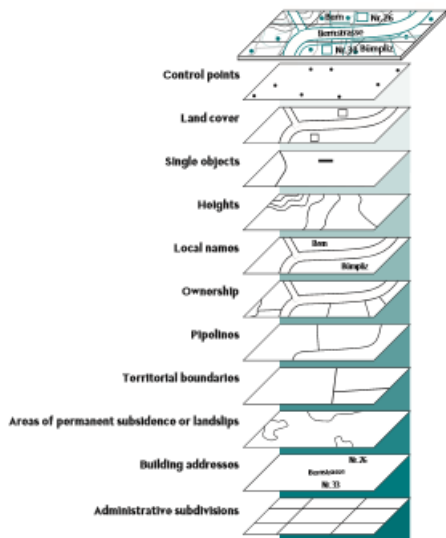
Apps will be the basis of all land representations, including those in the cadaster



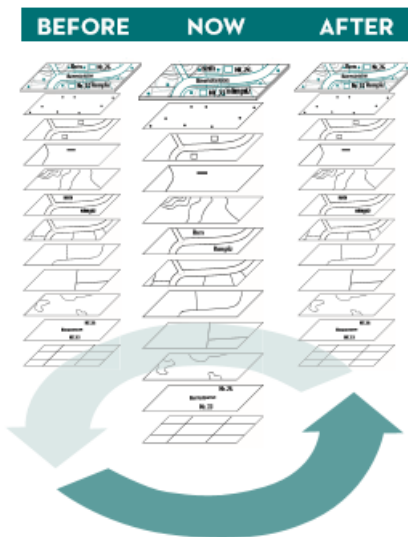


# Evolution of cadastre

## STATIC VISION (2D-3D) BY LAYER



## DYNAMIC VISION (4D) BY CAROUSEL



## The principle of legal independance

### Legal Topics :

- .....
- Resource exploitation
- Collective land rights
- Water protection
- Traditional rights
- Environmental protection
- Land use planning
- Land property
- Topography
- Natural resources
- Natural land objects

### Legal Object Boundaries : Rightful Claimants :



- .....
- Chartered company
- Corporation
- Society
- Tribe, Clan
- Society
- Society
- Private Land Owners
- Society
- Society
- Society

Numerous political  
decisions depend on  
official data



# Evolution of cadastre

- Cadastre will stay the base for securing real estate (in Germany)
- Using of a completed ALKIS-system will provide the immediate continuation of cadastral maps after the measurement
- “Fit for purpose”, delivering cadastral data by an easier way



# Evolution of citizen

- The augmented citizen...

Citizens as the nation's number one surveyors !





# Evolution of citizen

- Crowdsourcing,  
like Google

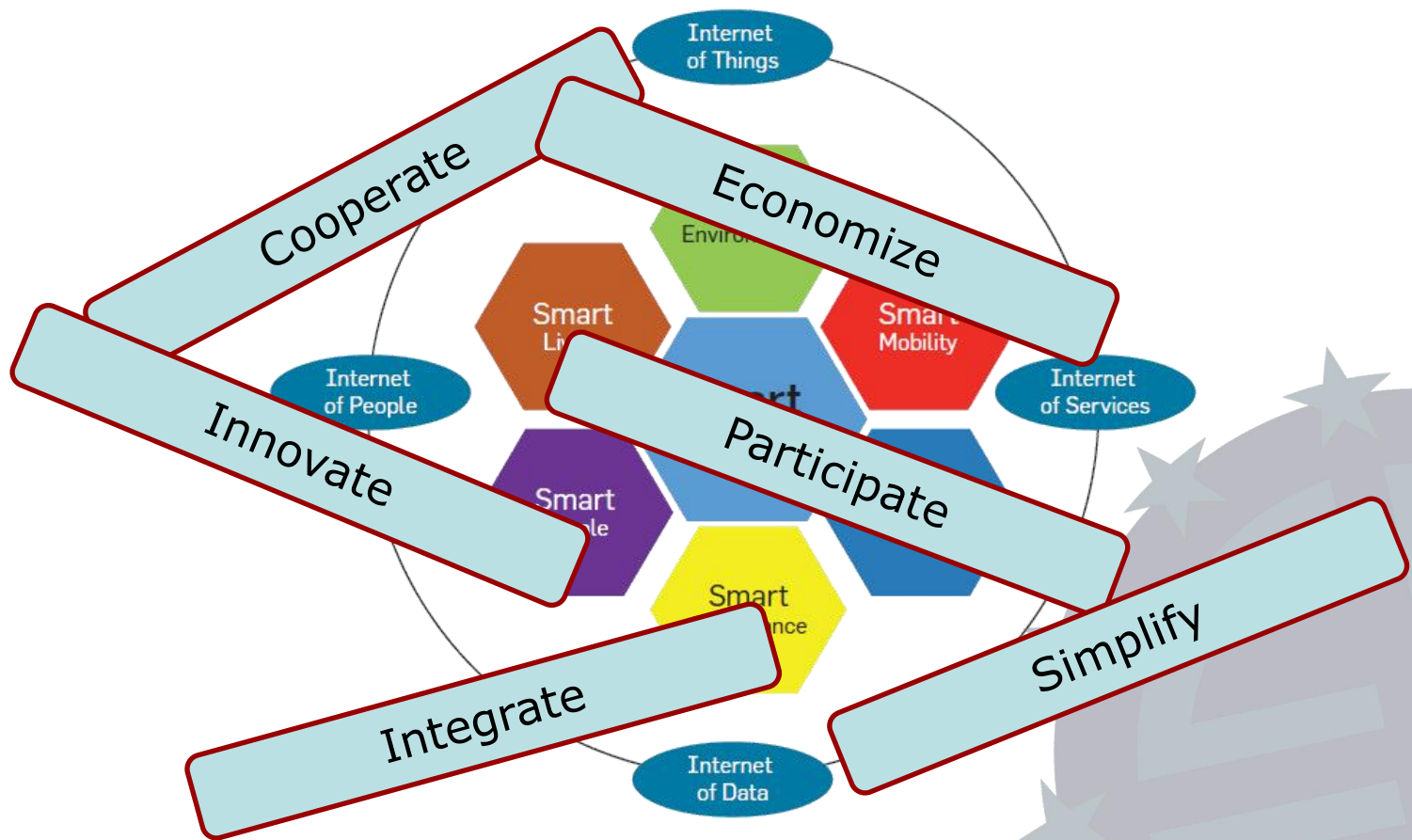
The legitimate often prevails  
over the legal

The territory is the map





# Smart Cities





# Utopia

- A.I. and smart machines will allow the world to run itself, with intelligent automation there will be no errors, no delays, no accidents
- Interpretation of data will be done automatically
- Instruments can be used easier by self-running systems
- A finished homogeneous cadastre
- An installed “Fit for Purpose” worldwide, sustainably preferred



# Utopia

- Use of smartphones as a handheld for geodetic measurements
- Possibly even smartphones used as surveying instruments
- Free use of spatial data for everybody (e. g. Maps.me)







# Dystopia

- There's no need for so many surveyors because of the self-running systems, smartphones as geodetic instruments and a completed cadastre, what means a jobless future
- Surveillance will grow with increasing spatial data
- A.I. could deny the access to spatial data in some cases



# Dystopia

- Cadastre will not be finished,
- No sustainability of cadastral projects
- Do we need (official) maps if there is open street map?

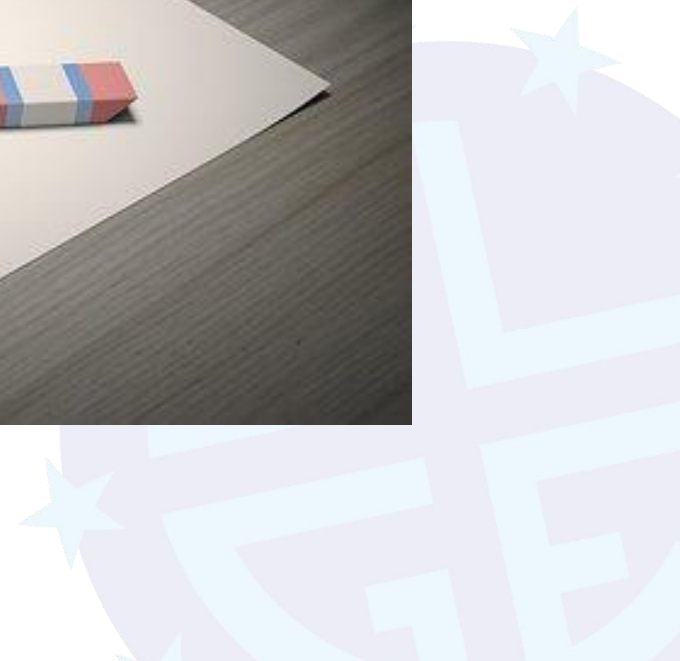




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But in 2030 reality at the end of the day...





... we will still grab for bricks

