

# Demand-driven improvement of government geodata

*or*

How to tap the knowledge of the crowd to get more up-to-date  
and still trustworthy data in government registers

DATA ECOSYSTEMS AND SPATIAL DATA INFRASTRUCTURE WORKSHOP

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# Authors – short biographies

- **Thorben Hansen**, M.Sc. and independent consultant. Throughout his career Thorben has worked with geodata, spatial data infrastructure, and digitization, both in Denmark and internationally, and with employment both in private companies and in the public sector. Thorben's field is digitization and how advances in technology can be utilized as a mean to develop business.
- **Lennart Hansen**, M.Sc. at LIFA, Chartered Land Surveyors a/s. Lennart has been involved in establishing the Danish spatial planning system in advisory roles for both the Chartered Land Surveyors Association and for the National Planning Department. Furthermore, Lennart has headed projects creating municipal plan frameworks and local development plans for many municipalities.
- **Bent Hulegaard Jensen**, M.Sc. at Geopartner, Chartered Land Surveyors a/s and associate professor with affiliation to Aalborg University (land surveyor education). Bent has – both as an affiliate to Aalborg University and as a chartered land surveyor – worked with geodata in relation to especially the property data area and has been involved in various development and implementation projects.

# Increased availability of geodata

- Open data initiatives have removed cost of data from the point of use
- Implementation of the INSPIRE directive has standardized and matured the way geodata is disseminated
- Current focus on data ecosystems makes geodata an embedded element in data driven value creation within many domains and sectors
- Data that can be sensed from above (drone, airplane, satellite) is increasingly available in constantly improved quality at constantly decreased cost

## **BUT**

- Not all geodata can be sensed from above

# Manually interpreted geodata

- Creation and maintenance of geodata with attributes that need to be determined on-location or be assessed individually takes manual involvement.
- Government geodata involving such manual interpretation is typically created based on legislation, e.g.:
  - Parcel boundaries
  - Planning areas
  - Building information regarding interior features
  - ...
- Increased use of such geodata – including use for purposes it was not originally intended – challenges data quality.
- A much-needed quality improvement of such geodata in a traditional government environment requires a considerable amount of government resources, resources that will hardly become available even though substantial legal and financial interests are tied to the data.

# Where is the knowledge – and how to tap it

- Knowledge about the topics covered by government registers containing manually interpreted geodata often resides in citizens and professionals, but generally remain unutilized due to overwhelming costs for collection and coordination.
- Initiatives around crowdsourcing and volunteered geographic information have shown that it is feasible to tap the knowledge of the crowd and aggregate it into shared data resources.
- Can a similar approach be used to tap knowledge from citizens and professionals into government registers containing manually interpreted geodata?
- What are the incentives for citizens and professionals to contribute to such government registers with data improvements, and how can it be assured that the contributed data does improve the quality of the registers (and not e.g., is improperly influenced by to the legal or financial significance of data in the register)?

A few real-world examples

# Case A: Home condition reports

- A home condition report is the result of a building review carried out before a house is sold by an appointed building expert under the house inspection scheme
- Building experts make reports based on on-site examination combined with collection and evaluation of data from, among other things, the building and dwelling register
  - and sometimes identifies deviations
  - ...and leaves the building and dwelling register unchanged!
- Why are these trusted building experts not obliged to correct data in the building and dwelling register?



# Case B: Home valuation for mortgage

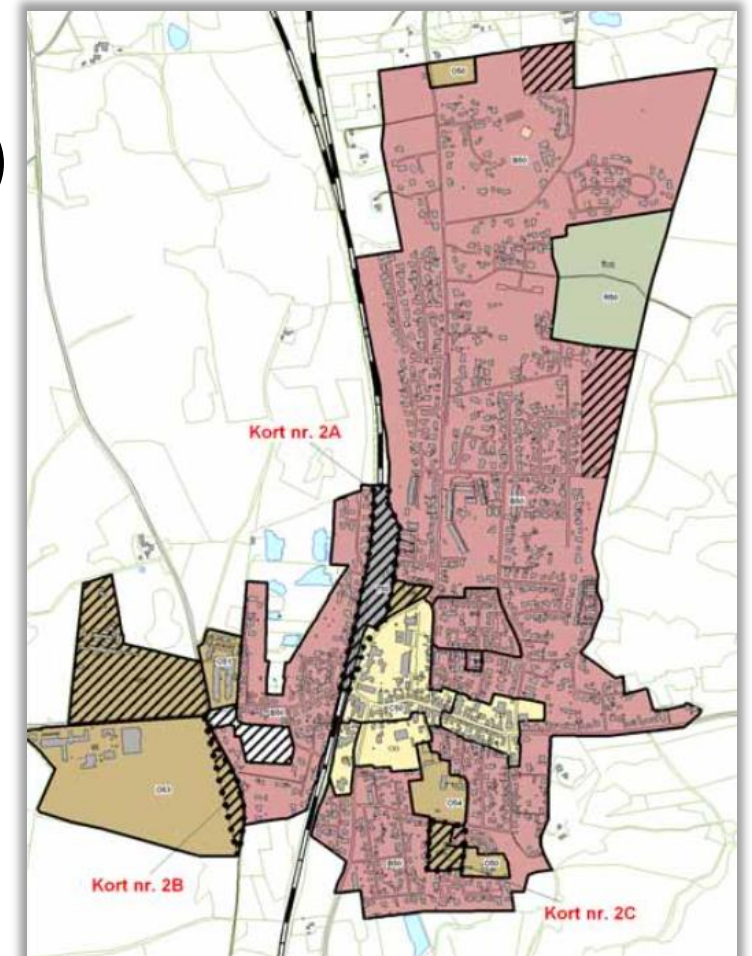
- Mortgages for houses are based on a valuation that includes assessment of the properties and features of the houses
- Credit unions make assessments based on on-site examinations combined with collection and evaluation of data from, among other things, the building and dwelling register
  - and sometimes identifies deviations
  - ...and leaves the building and dwelling register unchanged!
- Why are these highly regulated credit unions not obliged to correct data in the building and dwelling register?





# Case C: Real estate cadastral case handling

- Property ownership rights for real estate parcels are defined as part of cadastral case handling (e.g., about planning zone status, easements, etc.)
- Chartered land surveyors survey and unravel parcel properties including planning zones and easements as part of cadastral case handling
  - and sometimes find that planning zones are defined with inaccurate location or that easements lack location details or are obsolete
  - ...and leaves the planning register and the land registration registers unchanged!
- Why are these chartered surveyors not obliged to correct data in the planning and land registration registers?

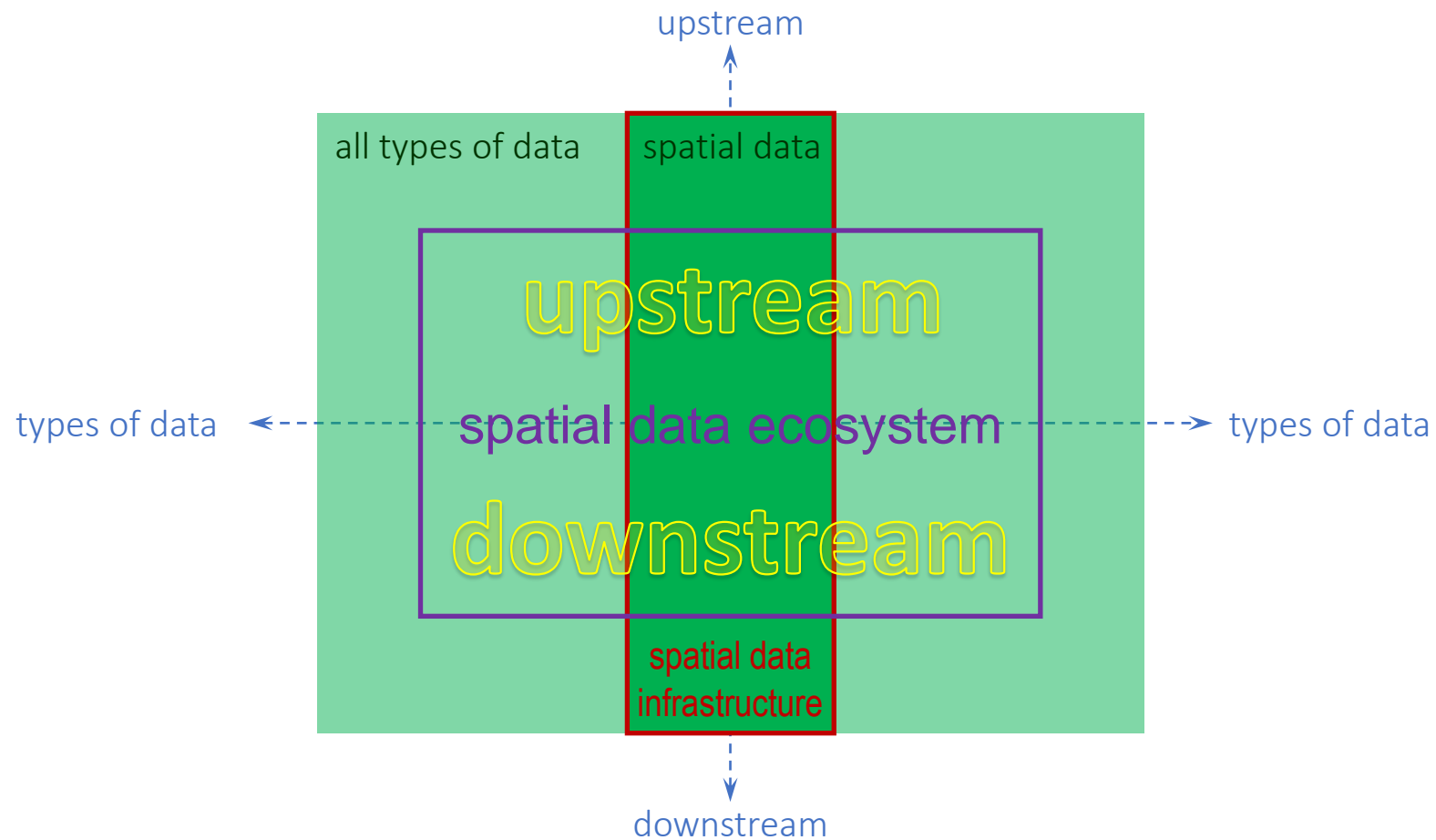


# Next generation – what is the goal?

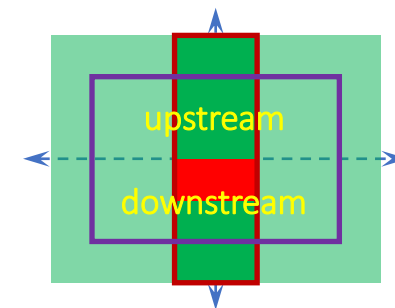
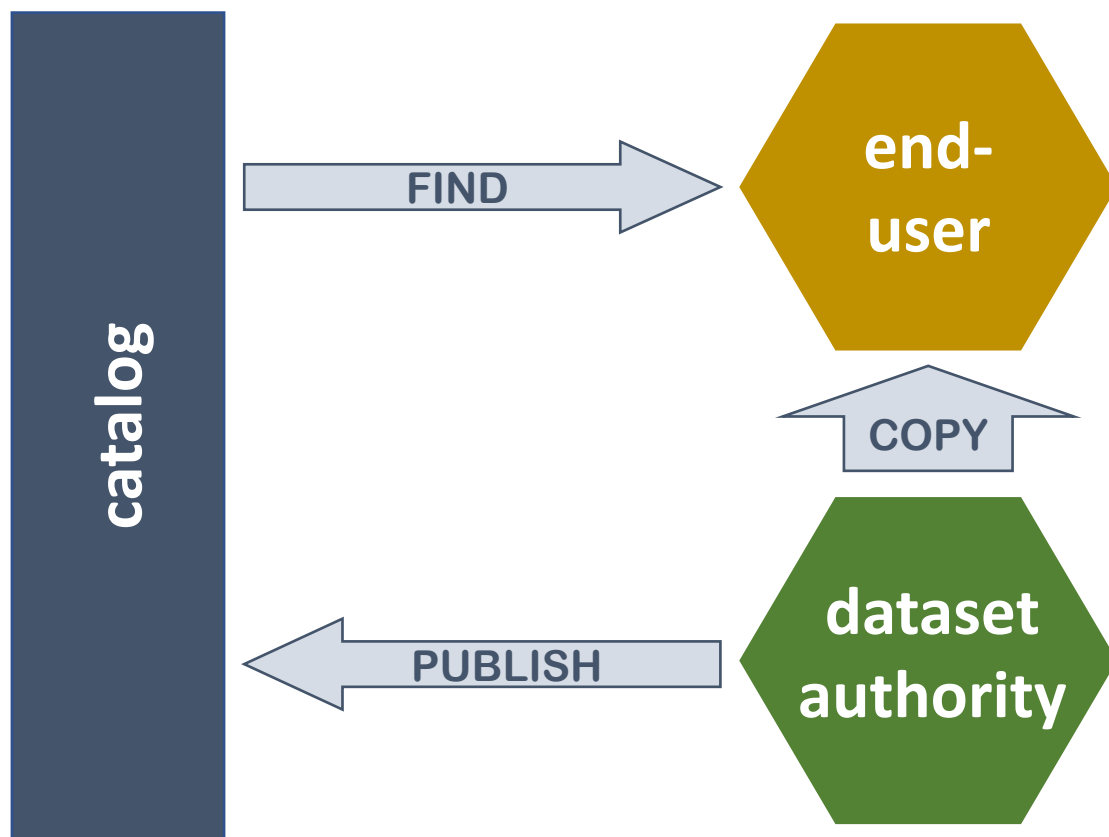
- A new business model for how manually interpreted geodata is aggregated and maintained in a cost-effective way as high-quality shared data resources, where:
  - knowledge that resides in citizens and professionals is utilized,
  - data handled via the model can be trusted,
  - activities are demand-driven,
  - resources are scaled to meet demand, and
  - funding is tied to value creation

New business model – desk exercise

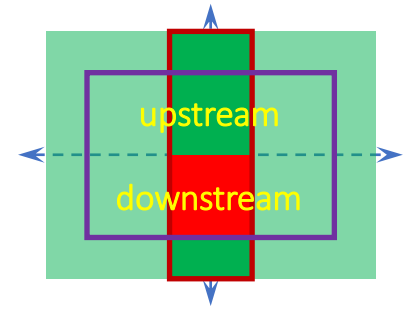
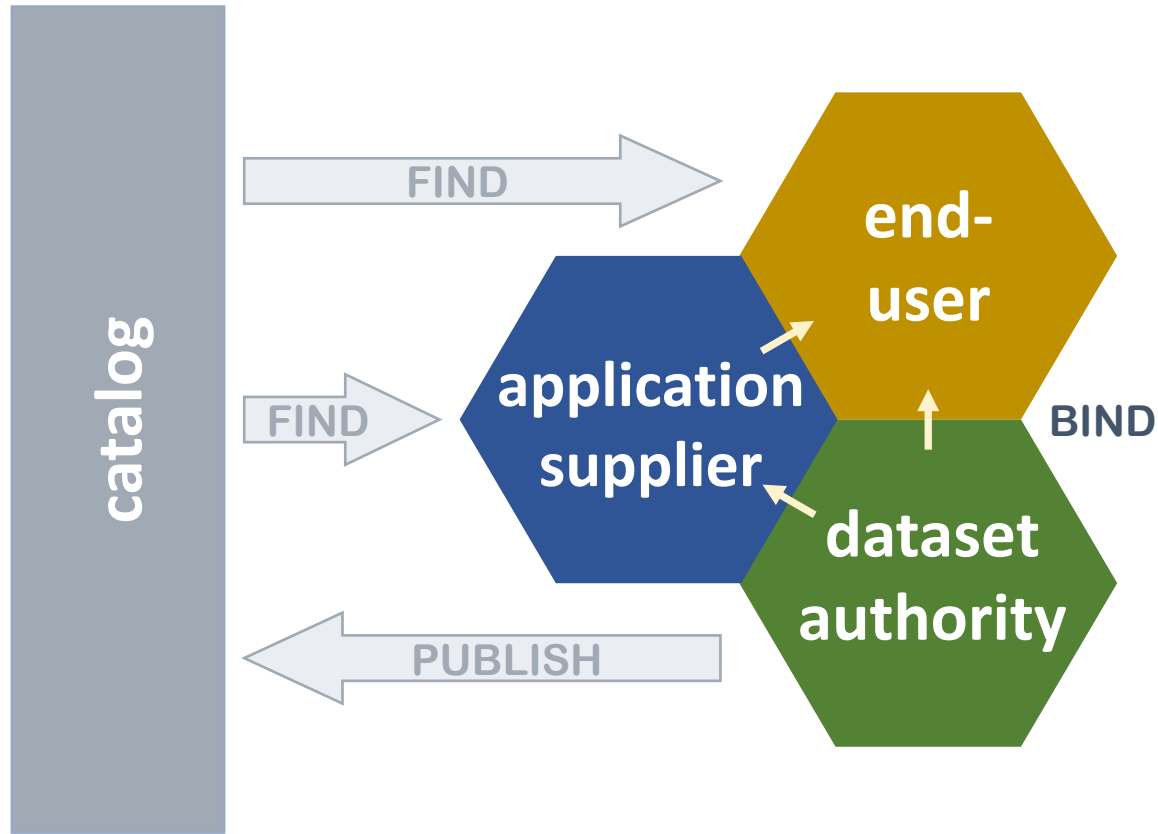
# Data ecosystem / spatial data ecosystem



# 1<sup>st</sup> generation – catalogue

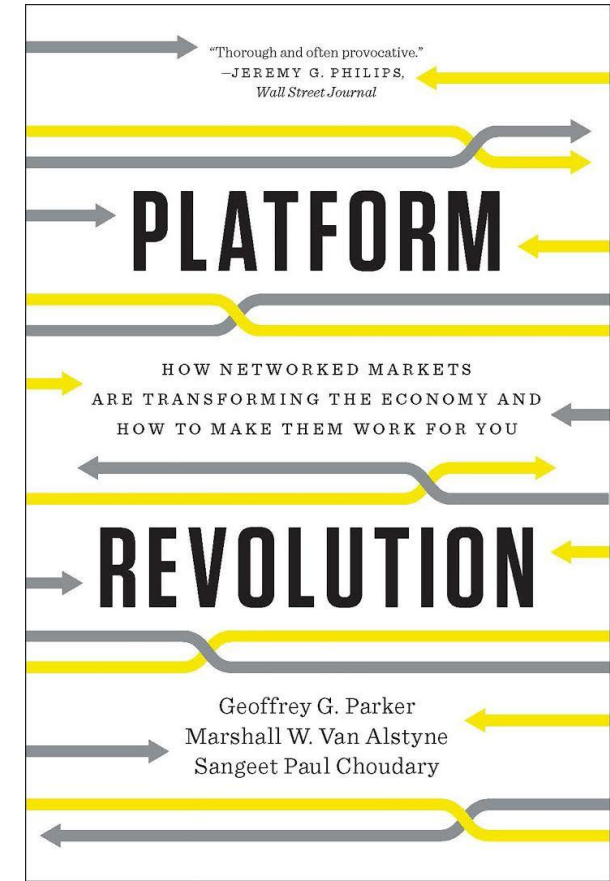


# 2<sup>nd</sup> generation – disseminate



# Inspiration: Digital Business Platform

- A business based on enabling value-creating interactions between external producers and consumers.
- The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them.
- The platform's overarching purpose is to consummate matches among users and facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants.



# Pipeline

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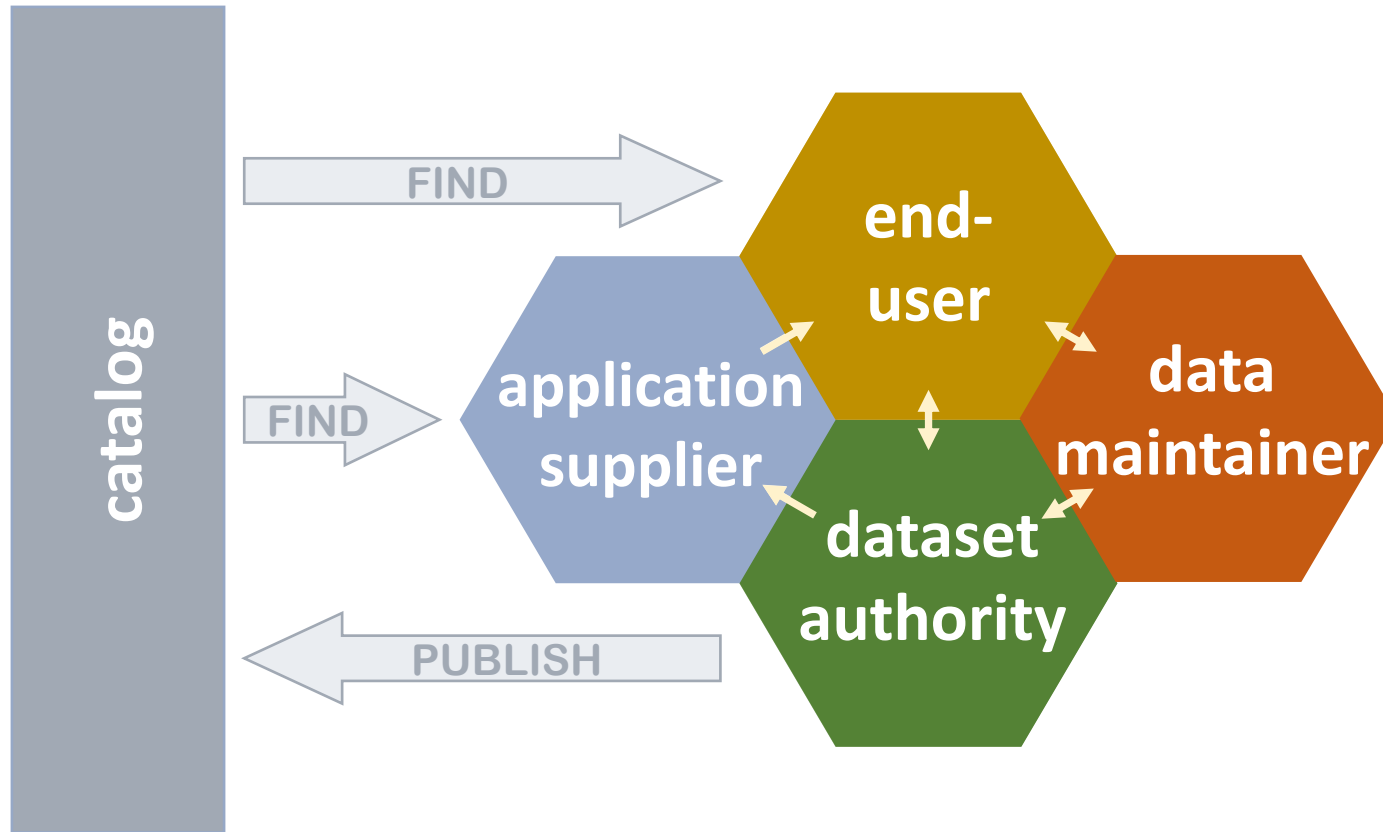
# Platform

- Linear Value Creation
- Resource control
- Internal optimization
- Focus on customer value
- Supply-side economics of scale
- Scales linearly

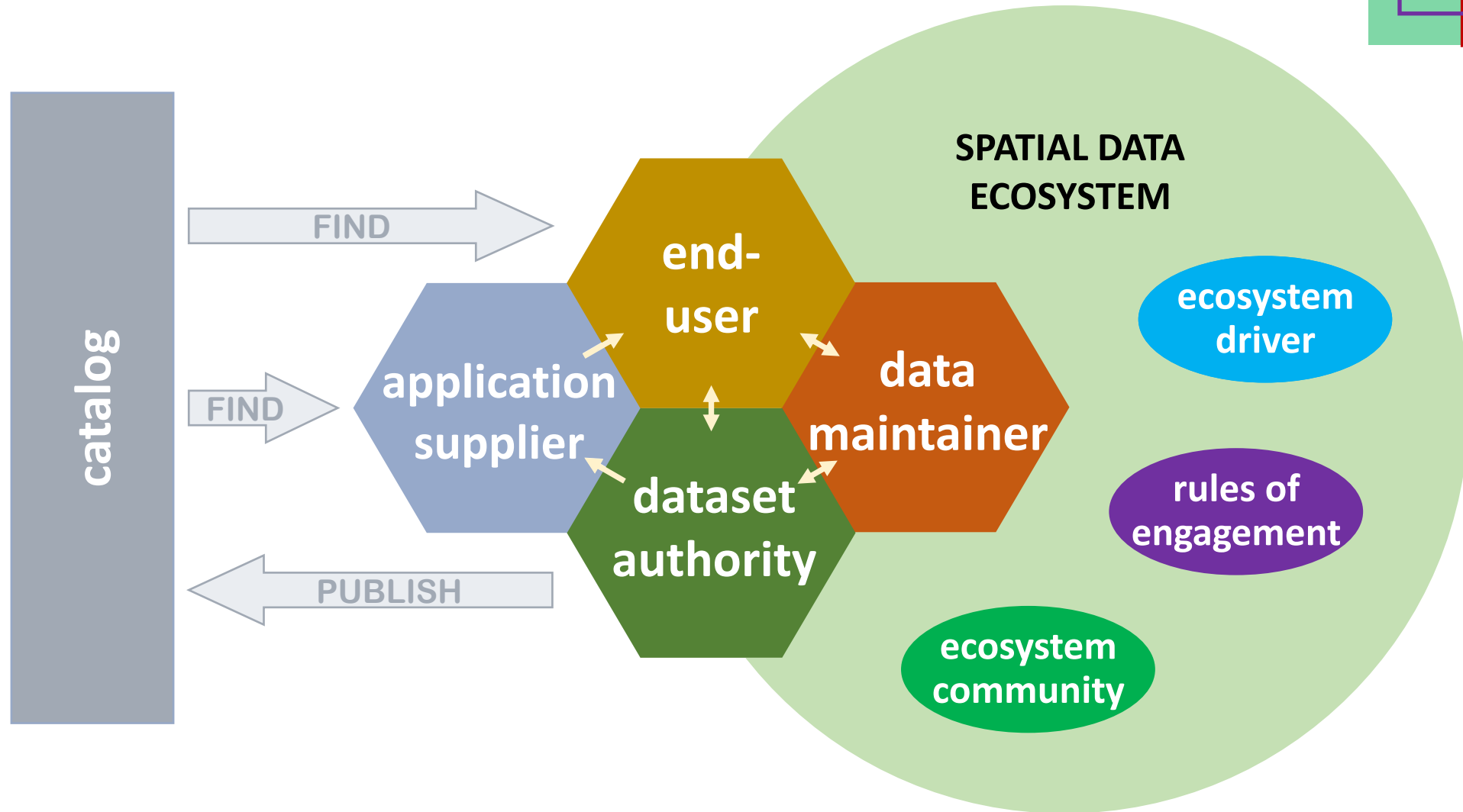
- Multidirectional Value Creation
- Resource orchestration
- External interaction
- Focus on ecosystem value
- Demand-side economics of scale
- Scales exponentially



# Next generation – collaborate



# Next generation – collaborate



New business model – can it work?

# Addressing 'to-be' challenges

- Trust
  - Only trusted users are approved as authorized data contributors
  - Trusted users must operate under professional responsibility and be covered by liability insurance
- Incentives
  - Requirement for use of verified and – if necessary – updated data in conjunction with triggering events
- Funding
  - End-user(s) with primary interest in an event triggering data contribution pays for the task of providing the data contribution

# Addressing 'to-be' challenges - examples

Case	Trust	Incentives	Funding
<b>A:</b> Home condition reports	Appointed building experts	Added requirement for home condition report	Home seller <i>(marginal added cost)</i>
<b>B:</b> Home valuation for mortgage	Authorized credit unions	Added requirement for mortgage approval	Borrower <i>(marginal added cost)</i>
<b>C:</b> Real estate cadastral case handling	Chartered land surveyors	Added requirement for cadastral case handling	Landowner <i>(marginal added cost)</i>

# Checking against the goal

- knowledge that resides in citizens and professionals is utilized
  - ✓ data knowledge emerging from use related activities is utilized
- data handled via the model can be trusted
  - ✓ trusted users operate under professional responsibility and covered by liability insurance
- activities are demand-driven
  - ✓ events, where manually interpreted geodata is particularly valuable, trigger maintenance
- resources are scaled to meet demand
  - ✓ trusted user community can scale involvement based on demand
- funding is tied to value creation
  - ✓ data contributions financed by end-users with primary interest in events triggering data contributions

# Caveats

The outlined business model seems compelling

– BUT is disruption possible/welcomed?

- Ecosystem driver
  - Who has the power?
  - Who is willing to take the role?
- Dataset authorities
  - Will dataset authorities embrace the outlined business model
    - Taxi companies did not embrace Uber
    - Hotel chains did not embrace Airbnb

# Articles about same topic from the authors

- Demand-driven improvement of government geodata
  - <https://www.idunn.no/doi/10.18261/issn.2535-6003-2021-03-04-07>
- Behovsdrevet forbedring af retlige geodata – opfølgning og uddybning
  - <https://www.epaper.dk/landinspekt%C3%B8rforeningen/fagbladet-fra-2008/2021-5/> page 14-18.
- Behovsdrevet forbedring af retlige geodata
  - <https://www.epaper.dk/landinspekt%C3%B8rforeningen/fagbladet-fra-2008/2020-6/> page 36-41.