



Announcement webinar for the “Technical study for the development and implementation of digital building logbooks”

15 June, 14.00 – 16.00

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Agenda

Time	Agenda point
14:00 – 14:05	Opening of the session <i>Andreas Pauer – Project Director, Ecorys</i>
14:05 – 14:15	Opening remarks by the European Commission <i>Fulvia Raffaelli – Head of Unit, European Commission</i>
14:15 – 14:30	Presentation on the overall approach and timeline <i>Michael Flickenschild – Ecorys</i>
14:30 – 14:50	Presentation on the review of existing databases and sources <i>Martin van der Ende – Ecorys</i> <i>With an intervention by Jaan Saar – Estonian Ministry of Economic Affairs & Communications</i>
14:50 – 15:30	Presentation on the envisioned framework for an EU level DBL <i>Michel Bohms - TNO</i>
15:30 – 15:55	Moderated discussion on additional ideas and suggestions for the study
15:55 – 16:00	Closing of the session



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Opening remarks

*Fulvia RAFFAELLI, Head of Unit, DG
GROW H.1*

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Overall approach

*Michael FLICKENSCHILD, Project
coordinator, Ecorys*

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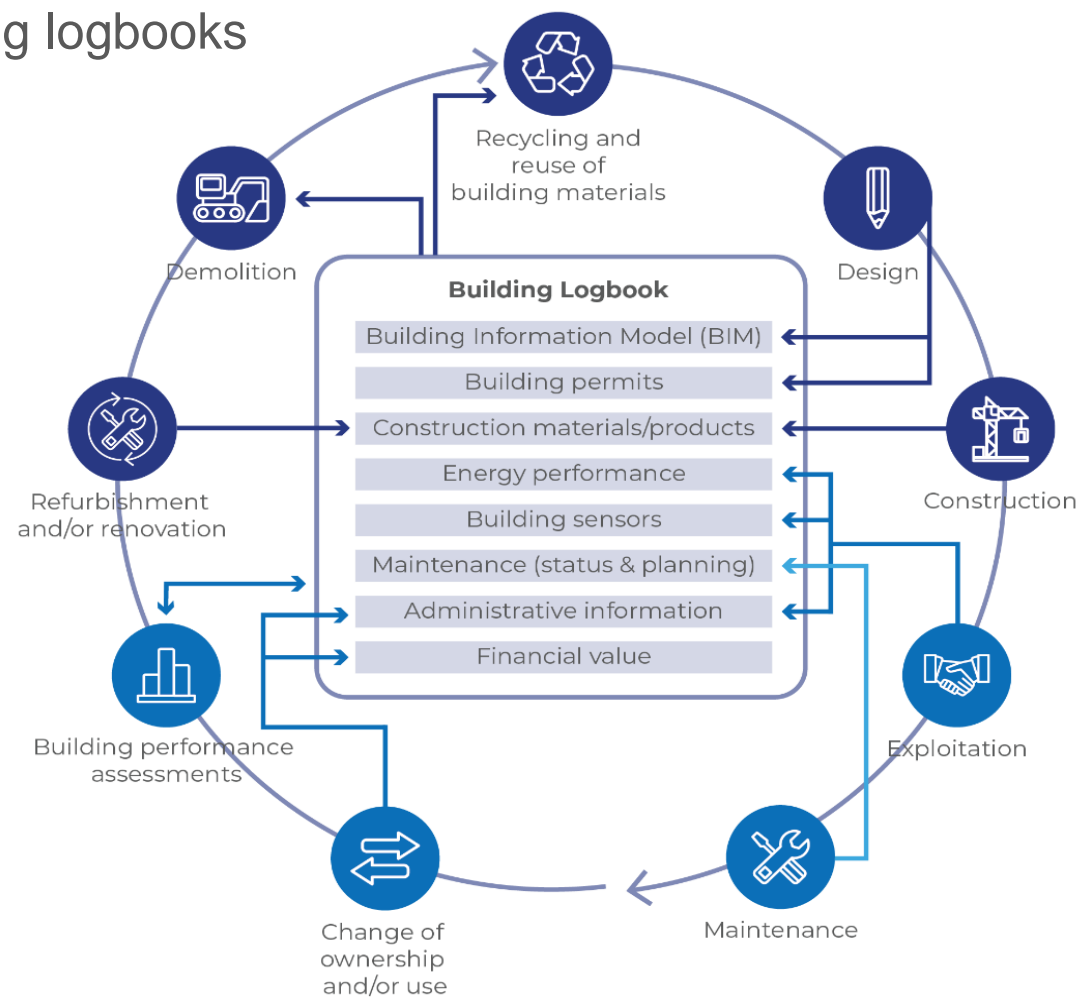


Overall approach (1)

Aim: development of an EU model for digital building logbooks

“A digital building logbook is a common repository for all relevant building data. It facilitates transparency, trust, informed decision making and information sharing within the construction sector, among building owners and occupants, financial institutions and public authorities.”

Source: Study on the development of a European Union Framework for Digital Building Logbooks (2020)



Overall approach (2)

Aim of an EU Framework for DBL

- Improve data sharing, use and organization and thereby support the creation of single EU digital construction market
- Need for a common EU Framework to improve efficiency & effectiveness
 - Harmonize a fragmented construction sector (strategic)
 - Avoid reinvention of the wheel (tactical)
 - Enable combination of data sources regardless of software used (operational)
- EC, Member States, Building Owners & Construction professionals are key stakeholders
 - Owners/Professionals bring & use data on buildings from BIM, GIS, BMS, ...
 - Member states develop national Digital Building Logbooks to link data
 - Framework and gateway at EU level
- **Central idea:** DBL is not a self-contained library but links existing databases

Overall approach (3)

This study is about how to meet needs and overcome barriers to make DBLs successful

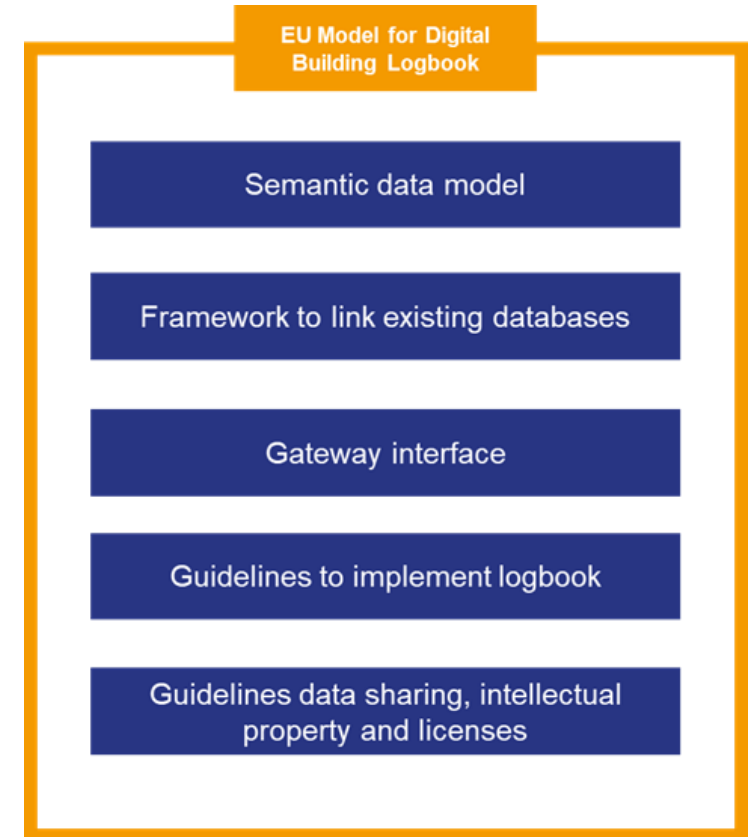
Benefits	Needs	Barriers
Faster compliance checks	Stakeholder involvement	Costs (implementation, updates, validation)
Data sharing along value chain	Clear scope of DBL	Manual updates
Increased building safety/life	Clear legal framework	Unclear data ownership
Accelerates open standards	Alignment with initiatives / standards	Limited access to data
Up-to-date data	Up-to-date data	Benefits are unclear
Measuring climate progress	Data validation	Fragmented regional approach (Italy, Spain)
More business (e.g., renovation)	Data sharing format	
	User friendliness	
	<i>(Facilitation of new trends)</i>	<i>(Lack of interoperability)</i>

Source: Study on the development of a European Union Framework for Digital Building Logbooks (2020)

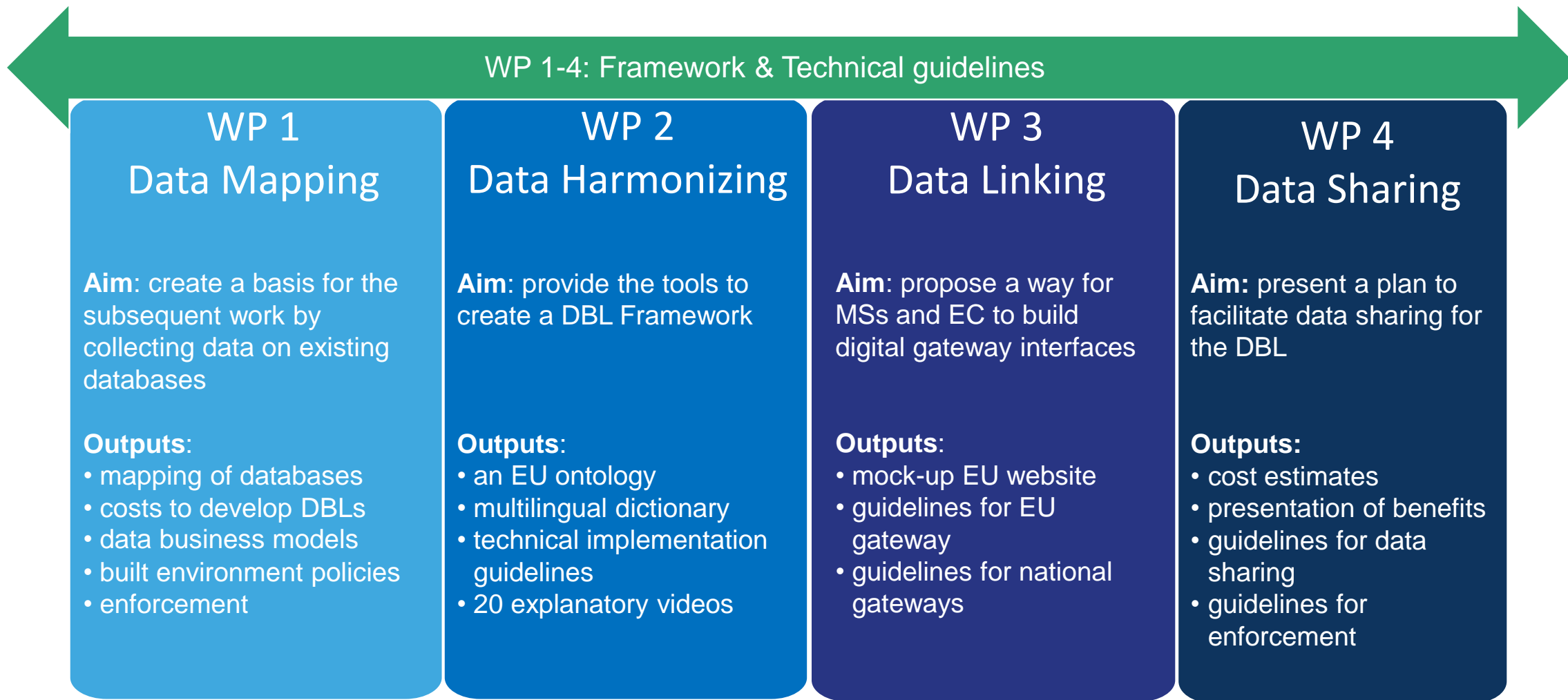
Overall approach (4)

Key deliverables

- An ontology for European digital building logbooks
(= dictionary + semantic data model)
- Overview of existing databases
- The logbook as a gateway: linking existing databases
- Guidelines on data sharing, intellectual property and licenses
- Guidelines on the implementation of logbooks



Overall approach (5)



Overall approach (6)

Stakeholder involvement

Month	Year	Activity	WP	Aim	Aspect
Jul-Sep	2022	Survey	1	Filling gaps	Database coverage
Sep	2022	Workshop	1-3	Discussion	Linking data & gateway approach
Nov	2022	Workshop	2	Discussion	Semantic data model approach
Dec-Jan	2022	Survey	1-2	Filling gaps	Existing semantic data models, costs
Mar	2023	Workshop	4	Discussion	Data sharing, costs, enforcement
May-Jun	2023	Survey	2-3	Validation	Feasibility of technical guidelines
Jun	2023	Workshop	2-3	Validation	Feasibility of technical guidelines
Sep	2023	Full-day event	1-4	Next steps	Presentation technical guidelines



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Mapping of databases and sources

Martin van der Ende, Project Manager, Ecorys

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Mapping of databases and sources (0)

Purpose of this Work Package

Work Package 1

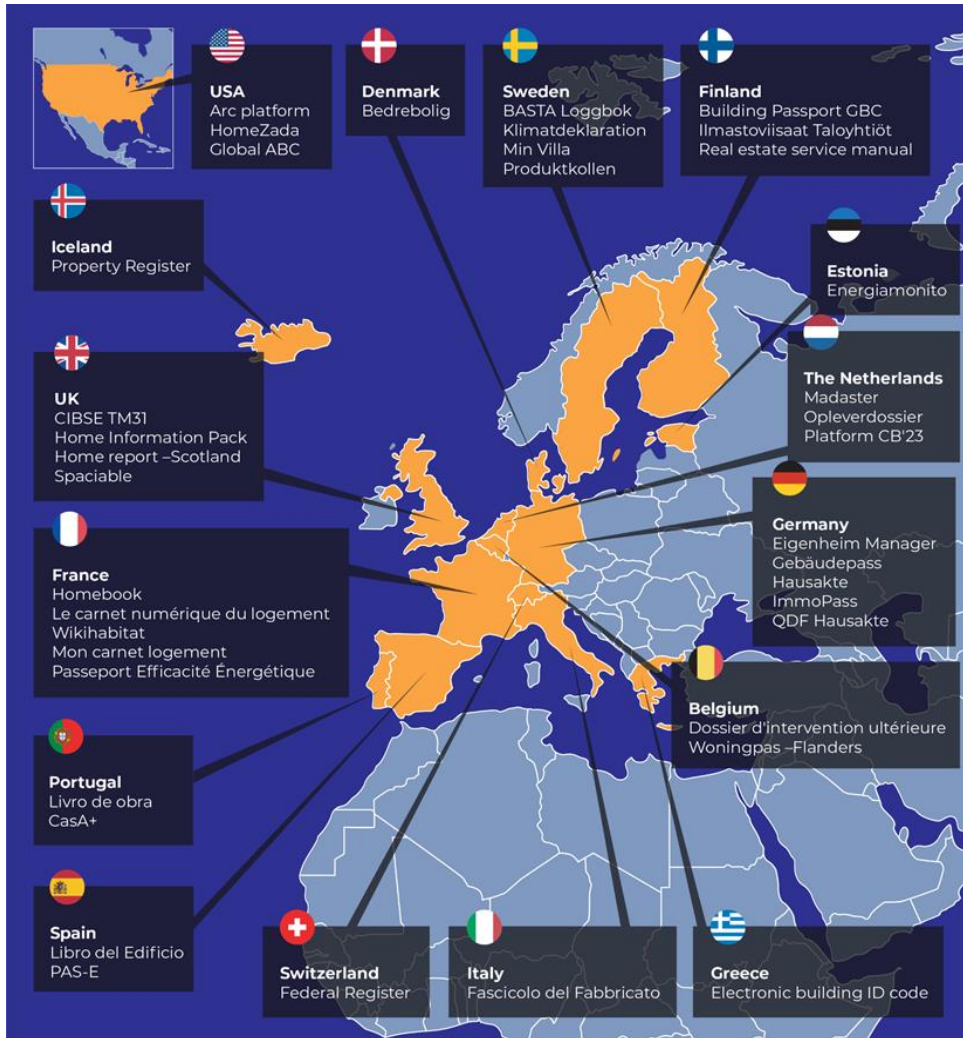
Aim: create a basis for the subsequent work by collecting data on existing databases

Outputs:

- mapping of databases
- cost to develop DBLs
- data business models
- built environment policies
- enforcement

Mapping of databases and sources (1)

Focus is on national DBLs; one case study on building owner / professional DBL



Example – E-construction platform (Estonia)

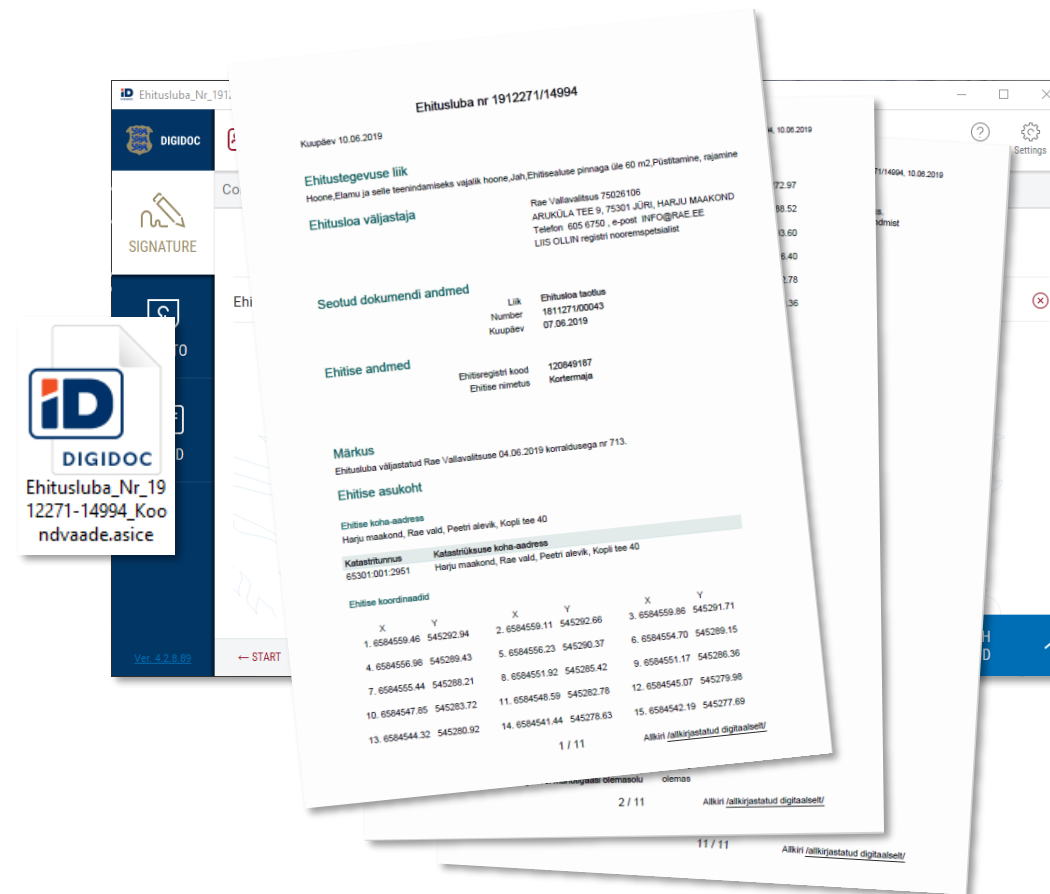
- Public
- Online
- Tool for data exchange between systems
- Lifecycle approach
- Building control data: professionals and authorities
- Utility, sales info: interested parties and authorities

Mapping of databases and sources (2)

Example Estonia: building registry

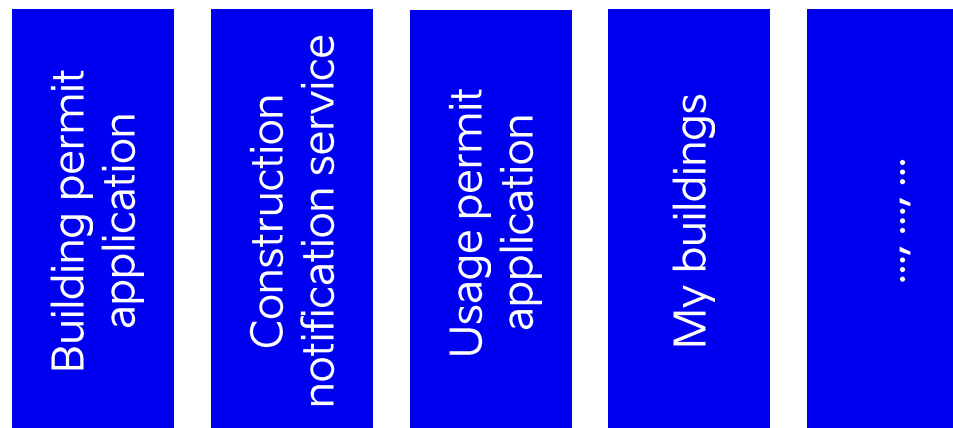
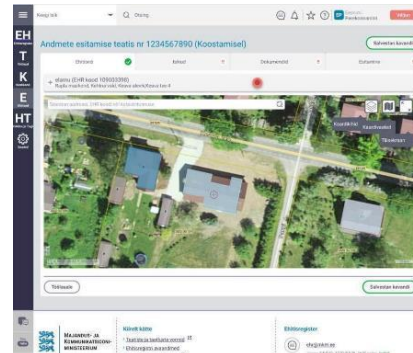
aka the **building logbook**

100% digital building permit process est 2016
 Used by all municipalities in Estonia
 over 32 000 procedures handled yearly
 Part of **e-construction platform**



Mapping of databases and sources (3)

Example Estonia: construction processes

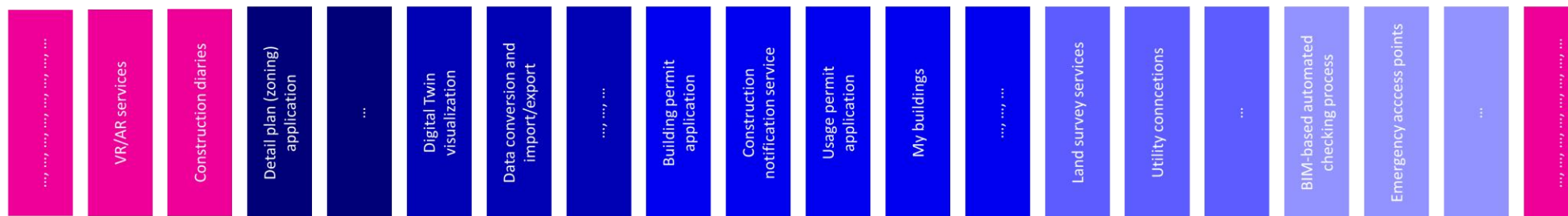
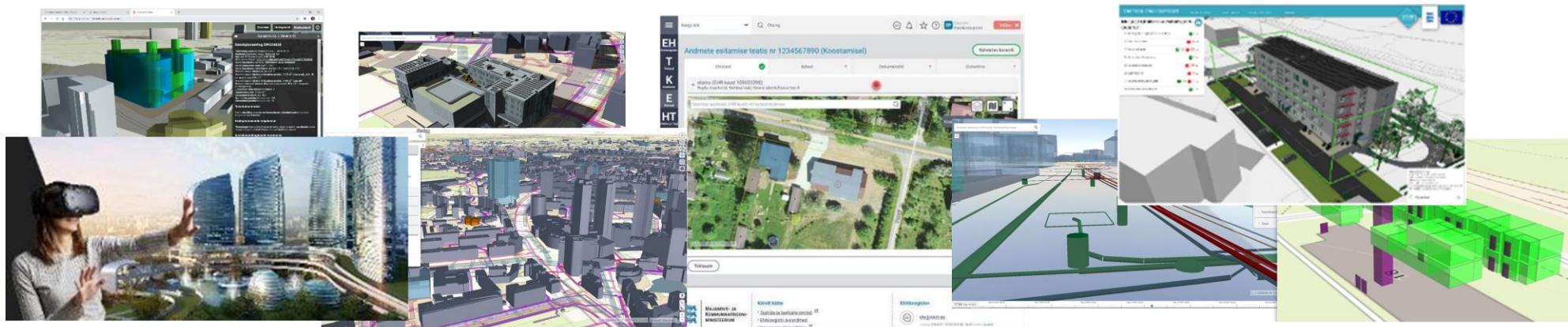


Building Registry (EHR) services



Mapping of databases and sources (4)

Example Estonia: before e-construction platform



Private sector

Other public services

Digital Twin services

Building Registry (EHR) services

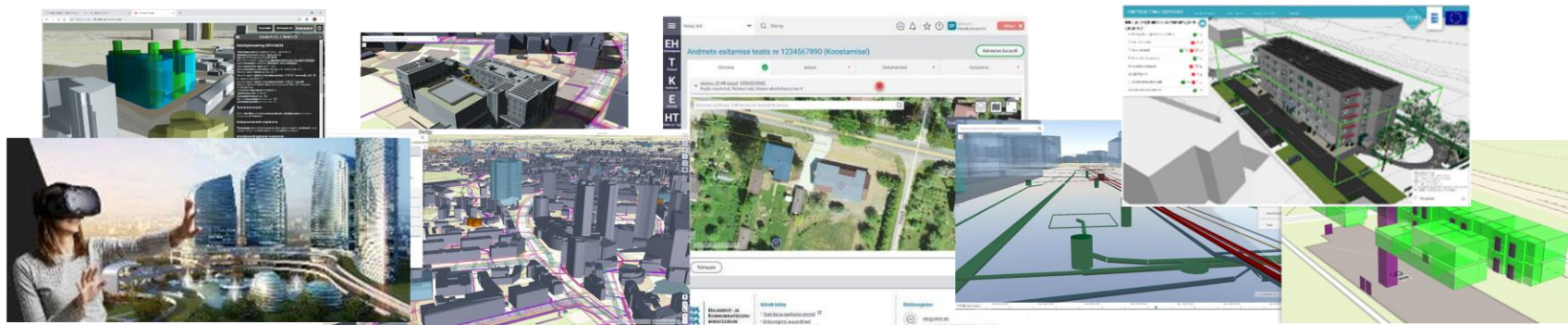
Utility Network (VRA) services

BIM services



Mapping of databases and sources (5)

Example Estonia: e-construction platform principles



Private sector

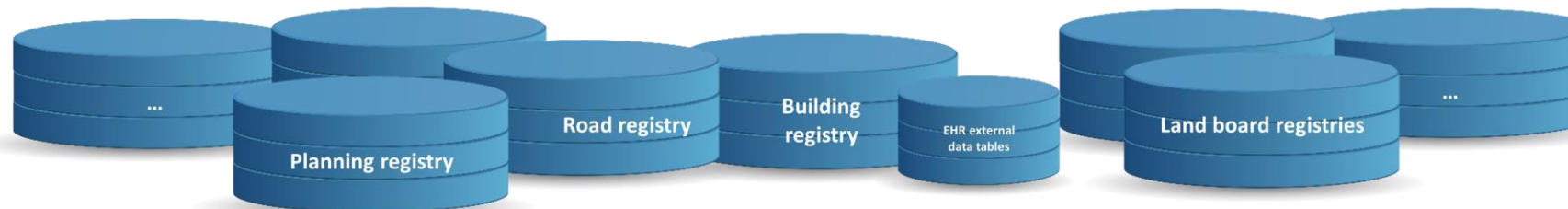
Other public services

Digital Twin services

Building Registry (EHR) services

Utility Network (VRA) services

BIM services



Mapping of databases and sources (6)

Example Estonia: benefits of the e-construction platform

e-construction platform

lossless **exchange of standardized and trustworthy data** between all stakeholders throughout the building lifecycle

- + connecting built environment data and services
- + Better data = better decisions
- + make BIM business as usual
- + more efficient and transparent public processes
- + added value from **new digital products and services**

Mapping of databases and sources (7)

Potential data fields, by % of Building Logbook initiatives already covering these

Asset-specific	Risk assessment	Use / maintenance	Financial
Building descriptions (86%) Register, monuments, use limitations	Flood risk	Electricity, ... consumption (38%) Dynamic data: 5%	Ownership (62%)
Building design, plans (57%) Building permit / delivery files	Earthquake risk	Local grids (electricity, ...)	Financial, insurance, legal docs (67%)
Designs and plans of building interventions (57%)	Pollution (soil, noise, water, air)	Electricity outages	(Lifecycle) cost information (29%)
BIM models (19%)	Soil subsidence	Recharging points	Tax valuation (29%)
Zoning / planning data (48%)	Foundation problems	Solar panels, heat pumps, ...	Insurance valuation
Building materials (67%)	Asbestos register	Boilers, ...	Claims (case law)
Energy performance cert. (52%)	Fire incidences, ...	Detectors, ...	
Info on renovation potential (29%)	Burglaries		

Source on %: Study on the development of a European Union Framework for Digital Building Logbooks (2020)

Mapping of databases and sources (8)

We collect the following information on databases for a DBL

All Member States	3 selected Member States
Name, hyperlink	Use cases (supported processes)
Open, downloadable, viewable, free?	Voluntary or mandatory?
Query feature (search for individual buildings)	Access conditions / business models
Owner name + contact data	User-friendliness of interface
	Language homogeneity between databases
	Aggregation level, interoperability

Proposed selection criteria:

- 2 MS with interesting DBL that links databases or otherwise facilitates data exchange (best practice to learn from)
- 1 MS with regional construction legislations (to identify additional problems for a national DBL for such countries)

Mapping of databases and sources (9)

High importance (I) and availability (A) of Building Logbook features

This study develops a framework for harmonizing (WP2), linking (WP3) and sharing (WP4) data

Functionality	I	A
Building and administrative information	--	86
Construction information	--	71
Contacts	--	57
Operation, maintenance, use	--	57
Compliance information	--	48
Energy performance	--	48
Authorisations to 3rd parties	40	33
Building diagnosis	--	29
Alerts, reminders, deadlines	--	24
Link to renovation roadmap	45	19

Functionality	I	A
Link with external databases	35	19
Valuation and financial due diligence	27	14
SMART information	--	10
Life-cycle costs	52	10
3. Notification of resource consumption	65	10
Benchmarking with similar buildings	42	10
2. Alerts on building performance / condition	67	5
Estimated environmental impact	50	5
1. Automatic input from 3D/BIM model	68	5

-- means mentioned by less than 25%

Source: Study on the development of a European Union Framework for Digital Building Logbooks (2020)

Questions on DBL mapping

- What Member States are the most interesting cases in the development of DBLs / repository / linking of BIM models?
- What type of information should DBLs include?



EU Framework for Digital Building Logbooks

Michel Bohms, WP2 Leader, TNO

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EU Framework for DBLs (0)

Purpose of this Work Package

Work Package 2

Aim: provide an EU-level DBL Framework

Outputs:

- an EU-level semantic data model (ontology)
- a multilingual dictionary
- technical implementation guidelines
- including explanatory videos

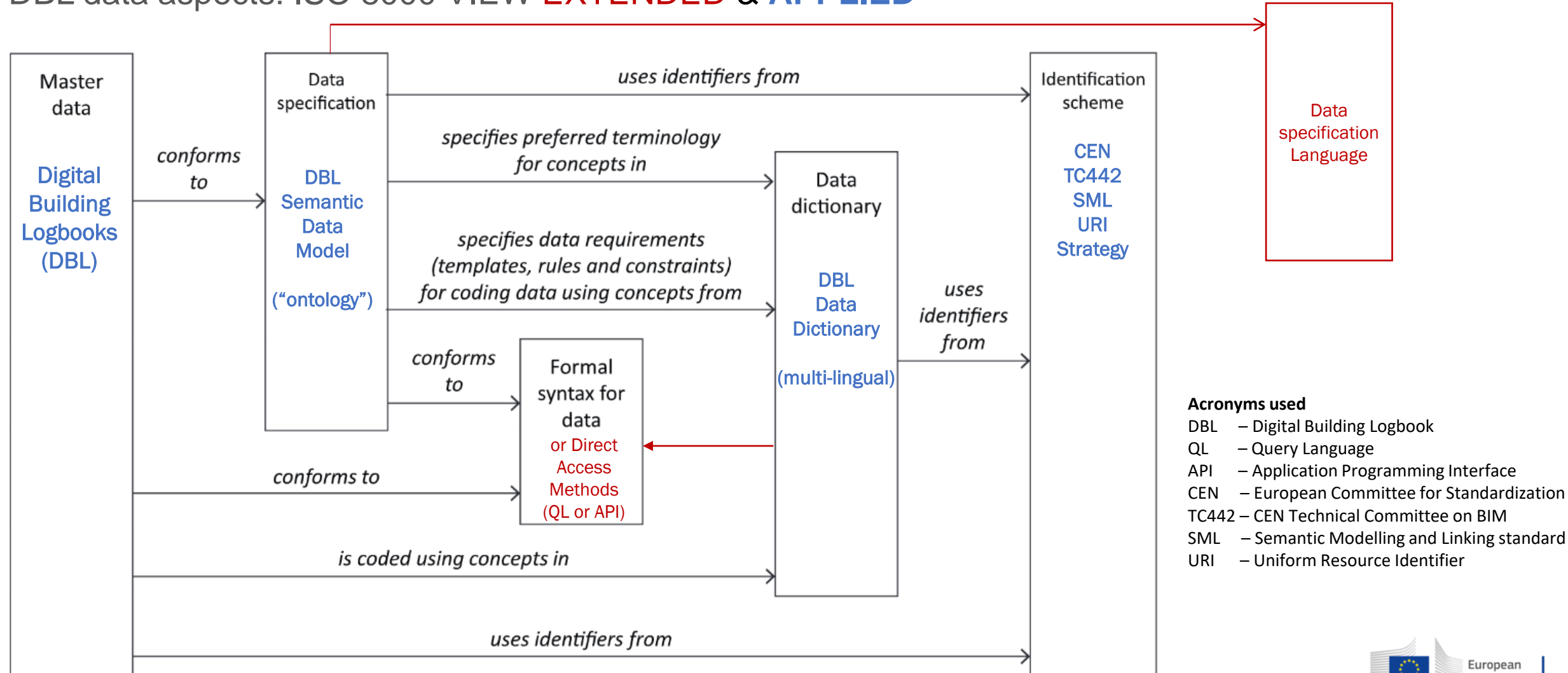
EU Framework for DBLs (1)

Perspectives involved, by percentage of DBL initiatives

Building types	Life-cycle phases	Disciplines	Data levels
Individual houses (90%)	Program	Cadastral	Semantic data
Multi-apartment buildings (67%)	Design	Financial	Representations
Office buildings (48%)	Fabricate	Functional	Visualizations
Industrial buildings (48%)	Construct	Architectural	Documents
Public buildings (48%)	Operate	Structural	
	Maintain	Materials	
	Renovate or Repurpose	Installations	
	Demolish	Energy	
	Recycle	Finishing	

EU Framework for DBLs (2)

DBL data aspects: ISO 8000 VIEW **EXTENDED** & **APPLIED**



EU Framework for DBLs (3)

Where are the various DBL data aspects defined?

Stakeholder / Geographic level	Formats & Direct access methods	Identification scheme	Language	Semantic Data Model & multi-lingual Data Dictionary	DBLs
EU/EC	like Turtle & SPARQL	like CEN-SML URI-strategy involving UUIDs	like SKOS & OWL	key results of project	asserted/ inferred by EU/EC
Member State/ National agencies		“Technology”		extended by national agencies like registry	asserted/ inferred by national agencies
Asset/ Building owner & Construction professional				extended by owners/ professionals	asserted/ inferred by owners/ professionals

Acronyms used

- DBL – Digital Building Logbook
- Turtle – Terse RDF Triple Language
- RDF – Resource Description Framework
- SPARQL – SPARQL Protocol and RDF Query Language
- UUID – Universally Unique IDentifier
- SKOS – Simple Knowledge Organization System
- OWL – Web Ontology Language
- SML – Semantic Modelling and Linking standard
- URI – Uniform Resource Identifier

EU Framework for DBLs (4)

Guiding data principle: FAIR

- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**eusable
 - **W**ell-defined (by data model!)
 - + Data Quality (context-dependent)
 - Relevant, useful, timely
 - Correct, complete, consistent
 - Precise enough, reproduceable, traceable

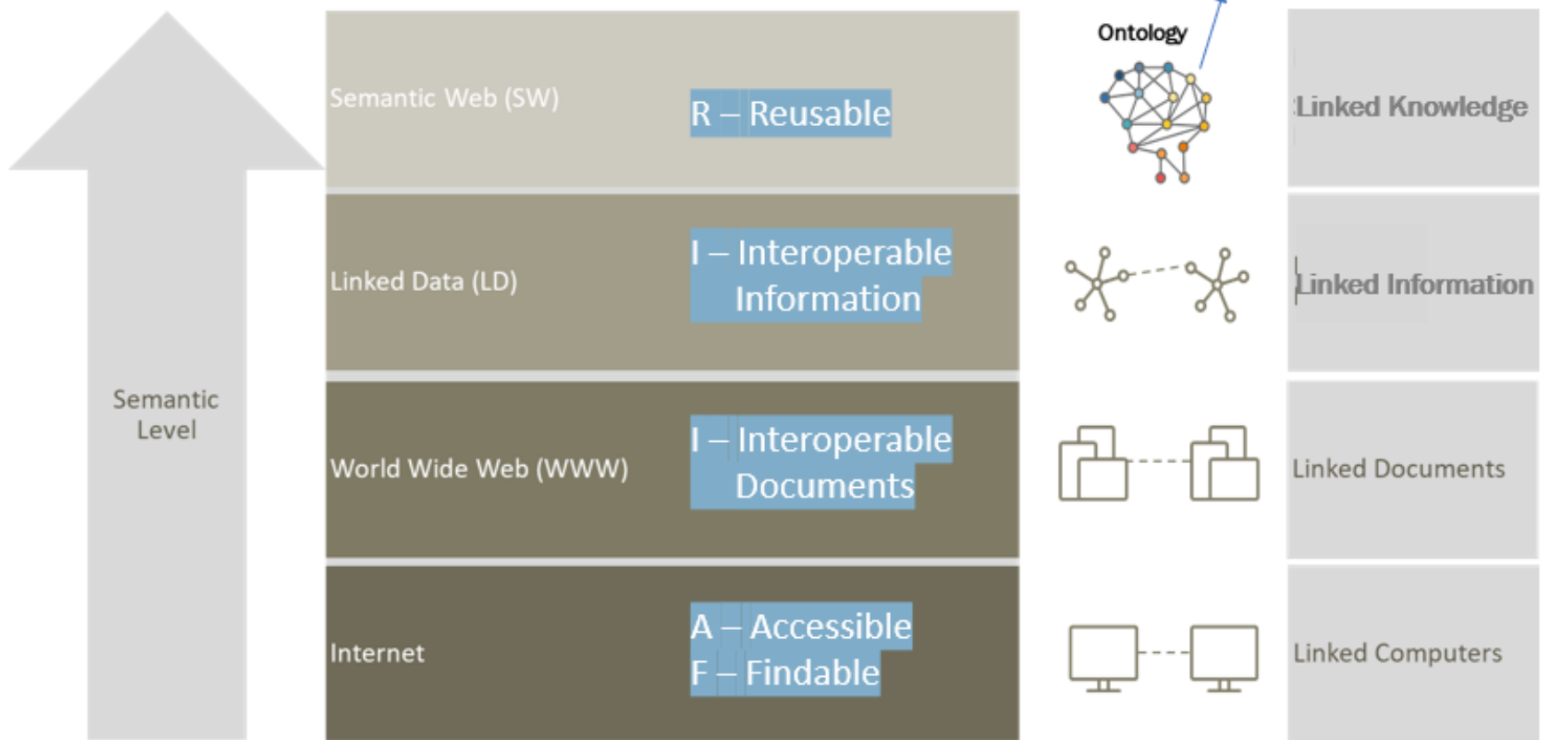


“GO FAIR is a bottom-up, stakeholder-driven and self-governed initiative that aims to implement the FAIR data principles, making data Findable, Accessible, Interoperable and Reusable (FAIR)”

EU Framework for DBLs (5)

Key enabler for FAIRness: W3C Linked Data/Semantic Web

W3C LD/SW:
“Standardization
not limiting Innovation”



Acronyms used

- W3C – WWW Consortium
- WWW – World Wide Web
- LD – Linked Data
- SW – Semantic Web

EU Framework for DBLs (6)

A small example ...

DBL Semantic Data Model

```
bot:Building a owl:Class ;
  rdfs:subClassOf bot:Zone ;
  rdfs:isDefinedBy bot: ;
  rdfs:seeAlso bot-term:Building .
```

```
dbl:onMap a owl:ObjectProperty ;
  rdfs:range xsd:anyURI .
```

```
ex:MyHouse a bot:Building ;
```

DBL Data

```
dbl:onMap
```

<https://3dbag.nl/en/viewer?rdx=73255.63631104137&rdy=443509.3808832952&ox=28.464074678500765&oy=39.095544912425325&oz=28.464074678486213> .

DBL Data Dictionary

```
bot-term:Building a skos:Concept
  skos:definition "Building - An independent unit of the
  built environment with a characteristic spatial structure,
  intended to serve at least one function or user activity
  [ISO-12006]."@en ;
  skos:definition "Gebouw - Een zelfstandige eenheid van de
  gebouwde omgeving met een karakteristieke ruimtelijke structuur,
  bedoeld om ten minste één functie of gebruikersactiviteit te vervullen
  [ISO-2006]."@nl ;
  skos:example "Multi-apartment building"@en ;
  skos:example "Multi-appartement gebouw"@nl .
```

EU Framework for DBLs (7)

A small example ...

When clicked:

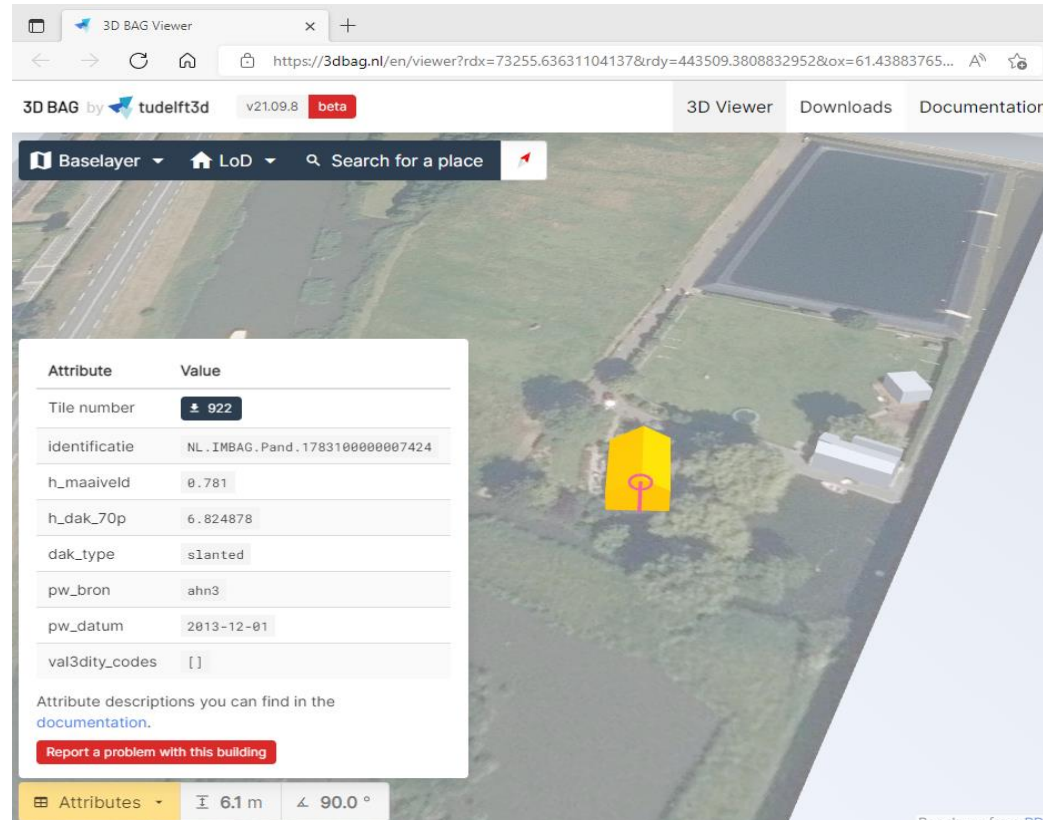
Experimental Dutch
3D GEO Buildings Registry

(3D BAG)

Itself in “CityJSON” (not LD/SW)

That is:

- OGC CityGML semantics
- JSON syntax



Acronyms used

- GEO – Geography
- BAG – Basisregistratie Adressen en Gebouwen (NL)
- JSON – (JavaScript Object Notation)
- OGC – Open Geospatial Consortium
- GML – Geography Markup Language
- LD – Linked Data
- SW – Semantic Web

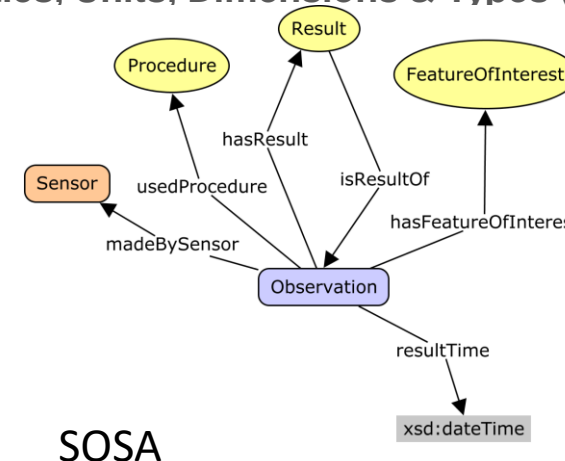
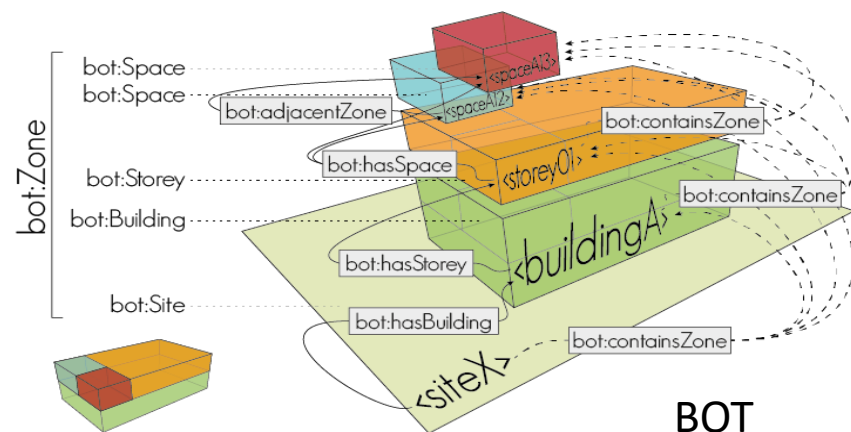
EU Framework for DBLs (8)

Study will build on existing resources where possible for DBL ontology / dictionary

- **CEN TC442 SML – Semantic Modelling and Linking**
- bSI Industry Foundation Classes (IFC / ifcOWL / ifcJSON)
- bSI buildingSmart Data Dictionary (bSDD, bsddRDFS, bsddJSON)
- OGC CityGML & cityjson.org CityJSON
- Google Building Ontology (GBO)
- **W3C Building Topology Ontology (BOT) & Sensor, Observation, Sample & Actuator (SOSA)**
 - OGC GeoSPARQL – W3C wgs84_pos (GPS) – W3C Time – Quantities, Units, Dimensions & Types (QUDT)



Building Information Modelling (BIM)



Questions on the EU framework

- What EU level harmonisation would create the most added value:
 - A harmonised dictionary
 - A harmonised ontology
 - Requirement to use given units of measurement
 - Conversion of units of measurement
 - International building identifiers
 - Other
- EU ontology:
 - For which building type is an EU ontology most useful?
 - For which life cycle phase is an EU ontology most useful?
 - What existing building ontologies do you know of / can you recommend?
 - Should the EU gateway have a feature to update the DBL ontology?
 - If yes who should have updating rights: MS, Commission, jointly, ...?

Digital gateway proposal (0)

Purpose of this Work Package

Work Package 3

Aim: propose a way for MSs and EC to build digital gateway interfaces

Outputs:

- mock-up EU website
- guidelines for EU gateway
- guidelines for national gateways

Digital gateway proposal (1)

Different guidelines for EU and national gateways

EU gateway

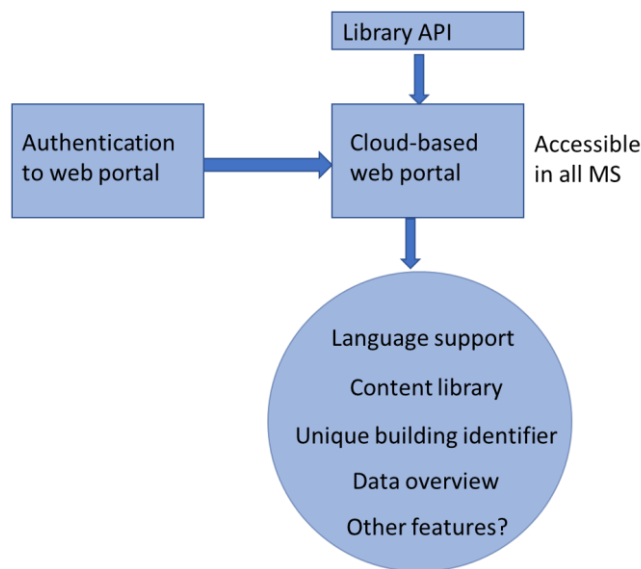
Data overview, guidelines, links to national portals

Deliverable: guidelines and mock-up

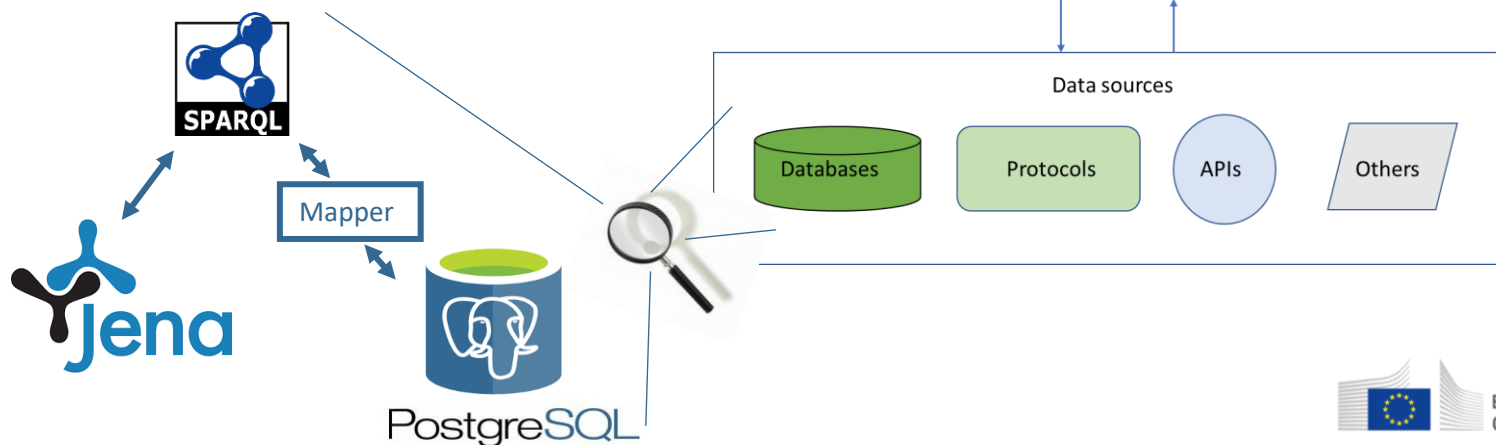
National gateways

Deeper integration to data itself

Deliverable: guidelines



Enabling forms of access to, direct or indirect, Common Data Environments (CDE) implementations of the defined conceptual DBL Framework (technology/ontology/dictionary)



Questions on the gateway proposal

EU gateway:

- Should the EU gateway have a query feature to search individual buildings?
 - And if yes:
 - Should building identifiers / search terms be harmonized at EU level or
 - Should EU gateway just "forward" the query to MS gateways and forward response back if query fails?
- What other features should the EU gateway have?

Member State gateways:

- Linking national and building data
 - Should MS gateway gateways act as main entry point retrieving information from both national and owner/professional databases, or
 - Should owner/professional DBLs retrieve data from the Member State gateway which still retrieves information from national databases



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Closing discussion

*Michael FLICKENSCHILD, Project
coordinator, Ecorys*

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Questions

- Which other stakeholders not present today should we reach out to?
- Would you be willing to share information about our study with them?
- What information about this project would be useful for you at this point?
- What materials can you share with us at this point?
- What relevant national, private, or EU level initiatives are you aware of?

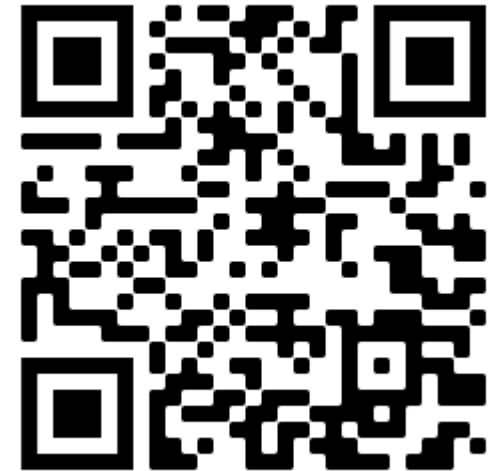
- *Any other comments, suggestions or questions to consider?*

Stay in touch

Any more questions or comments?

Then contact us at: BuildingLogbook@ecorys.com

And if not done yet, sign up to our DBL expert community and spread the word about it: <https://ec.europa.eu/eusurvey/runner/DBLsurvey2022>





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Thank you!

The DBL project team

BuildingLogbook@ecorys.com

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