Welcome to the event! Please note:

- The meeting is **recorded** for **internal purposes**.
- We kindly ask you to **turn off your microphone and camera**, unless you have the floor.
- You can use the **chat** to ask a question.
- We kindly ask you to please **don’t raise your hand**.
- If you have the floor, please **avoid background noise** and **check your internet connection**.

Technical issues: chat or Buildinglogbook@ecorys.com
Announcement webinar for the “Technical study for the development and implementation of digital building logbooks”

15 June, 14.00 – 16.00
<table>
<thead>
<tr>
<th>Time</th>
<th>Agenda point</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00 – 14:05</td>
<td><strong>Opening of the session</strong></td>
</tr>
<tr>
<td>14:05 – 14:15</td>
<td><strong>Opening remarks by the European Commission</strong></td>
</tr>
<tr>
<td>14:15 – 14:30</td>
<td><strong>Presentation on the overall approach and timeline</strong></td>
</tr>
<tr>
<td>14:30 – 14:50</td>
<td><strong>Presentation on the review of existing databases and sources</strong></td>
</tr>
<tr>
<td></td>
<td>With an intervention by Estonian Ministry of Economic Affairs &amp; Communications</td>
</tr>
<tr>
<td>14:50 – 15:30</td>
<td><strong>Presentation on the envisioned framework for an EU level DBL</strong></td>
</tr>
<tr>
<td>15:30 – 15:55</td>
<td><strong>Moderated discussion on additional ideas and suggestions for the study</strong></td>
</tr>
<tr>
<td>15:55 – 16:00</td>
<td><strong>Closing of the session</strong></td>
</tr>
</tbody>
</table>
Opening remarks
Overall approach

Ecorys
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.”

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.

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

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)**

**WP 1: Data Mapping**

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

**Outputs:**
- mapping of databases
- costs to develop DBLs
- data business models
- built environment policies
- enforcement

**WP 2: Data Harmonizing**

**Aim:** provide the tools to create a DBL Framework

**Outputs:**
- an EU ontology
- multilingual dictionary
- technical implementation guidelines
- 20 explanatory videos

**WP 3: Data Linking**

**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

**WP 4: Data Sharing**

**Aim:** present a plan to facilitate data sharing for the DBL

**Outputs:**
- cost estimates
- presentation of benefits
- guidelines for data sharing
- guidelines for enforcement

**WP 1-4: Framework & Technical guidelines**
## Overall approach (6)

### Stakeholder involvement

<table>
<thead>
<tr>
<th>Month</th>
<th>Year</th>
<th>Activity</th>
<th>WP</th>
<th>Aim</th>
<th>Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-Sep</td>
<td>2022</td>
<td>Survey</td>
<td>1</td>
<td>Filling gaps</td>
<td>Database coverage</td>
</tr>
<tr>
<td>Sep</td>
<td>2022</td>
<td>Workshop</td>
<td>1-3</td>
<td>Discussion</td>
<td>Linking data &amp; gateway approach</td>
</tr>
<tr>
<td>Nov</td>
<td>2022</td>
<td>Workshop</td>
<td>2</td>
<td>Discussion</td>
<td>Semantic data model approach</td>
</tr>
<tr>
<td>Dec-Jan</td>
<td>2022</td>
<td>Survey</td>
<td>1-2</td>
<td>Filling gaps</td>
<td>Existing semantic data models, costs</td>
</tr>
<tr>
<td>Mar</td>
<td>2023</td>
<td>Workshop</td>
<td>4</td>
<td>Discussion</td>
<td>Data sharing, costs, enforcement</td>
</tr>
<tr>
<td>May-Jun</td>
<td>2023</td>
<td>Survey</td>
<td>2-3</td>
<td>Validation</td>
<td>Feasibility of technical guidelines</td>
</tr>
<tr>
<td>Jun</td>
<td>2023</td>
<td>Workshop</td>
<td>2-3</td>
<td>Validation</td>
<td>Feasibility of technical guidelines</td>
</tr>
<tr>
<td>Sep</td>
<td>2023</td>
<td>Full-day event</td>
<td>1-4</td>
<td>Next steps</td>
<td>Presentation technical guidelines</td>
</tr>
</tbody>
</table>
Mapping of databases and sources

Ecorys
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 permit application
Construction notification service
Usage permit application
My buildings

Building Registry (EHR) services

Building registry
EHR external data tables
Mapping of databases and sources (4)

Example Estonia: before e-construction platform
Mapping of databases and sources (5)

Example Estonia: e-construction platform principles
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

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

Mapping of databases and sources (8)

We collect the following information on databases for a DBL

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

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

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

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

-- means mentioned by less than 25%

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

TNO

DBL
DIGITAL BUILDING
LOGBOOK
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

<table>
<thead>
<tr>
<th>Building types</th>
<th>Life-cycle phases</th>
<th>Disciplines</th>
<th>Data levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual houses (90%)</td>
<td>Program</td>
<td>Cadastral</td>
<td>Semantic data</td>
</tr>
<tr>
<td>Multi-apartment buildings (67%)</td>
<td>Design</td>
<td>Financial</td>
<td>Representations</td>
</tr>
<tr>
<td>Office buildings (48%)</td>
<td>Fabricate</td>
<td>Functional</td>
<td>Visualizations</td>
</tr>
<tr>
<td>Industrial buildings (48%)</td>
<td>Construct</td>
<td>Architectural</td>
<td>Documents</td>
</tr>
<tr>
<td>Public buildings (48%)</td>
<td>Operate</td>
<td>Structural</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain</td>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Renovate or Repurpose</td>
<td>Installations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demolish</td>
<td>Energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recycle</td>
<td>Finishing</td>
<td></td>
</tr>
</tbody>
</table>
EU Framework for DBLs (2)

DBL data aspects: ISO 8000 VIEW EXTENDED & APPLIED

**Acronyms used**
- DBL  – Digital Building Logbook
- QL   – Query Language
- API  – Application Programming Interface
- CEN  – European Committee for Standardization
- TC442  – CEN Technical Committee on BIM
- SML  – Semantic Modelling and Linking standard
- URI  – Uniform Resource Identifier
## EU Framework for DBLs (3)

Where are the various DBL data aspects defined?

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

**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
Guiding data principle: FAIR

- Findable
- Accessible
- Interoperable
- Reusable
  - Well-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

= semantic data model
**EU Framework for DBLs (6)**

**DBL Semantic Data Model**

```xml
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 .
```

**DBL Data Dictionary**

```xml
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 .
```

**DBL Data**

EU Framework for DBLs (7)

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)
- 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)
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
Closing discussion

Ecorys
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
Thank you!
The DBL project team
BuildingLogbook@ecorys.com
Mapping of databases and sources (extra - 1)

Example 1 of owner DBL: JC Arena information platform

- 3D Model
- Floor plans
- Façade
- Sections
- Visualisations
- KPI

Field
Players entrance
Goal

Ring
North
East
South
West

Parking
Level 1 - North
Level 1 - East
Level 1 - South
Level 1 - West
Level 2 - North
Level 2 - East
Level 2 - South
Level 2 - West
Mapping of databases and sources (extra - 2)
Example 2 of owner/professional DBL: Digital Twin Arcadis office Rotterdam