



THE UNIVERSITY *of* EDINBURGH
Edinburgh Futures Institute

Centre for Future Infrastructure

Using Data for Future Infrastructure and Construction

Scotland DAFNI Roadshow 2021





20-minute neighbourhoods

Utilising GIS and local authority data on community services, education, infrastructure, travel modes

Lead: Dr Dan Van der Horst (School of Geosciences)
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Aims:

- To support future decision making leading to inclusive and better supported communities
- To identify best uses of gap sites in communities to deliver 20-min neighbourhoods



Reduce flooding / Identify earlier

*Utilising satellite data, geo-surface conditions
with soil moisture conditions*

Lead: Dr Encarni Medina-Lopez (School of Engineering)
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Aims:

- To have a faster insight to potential flooding and support early warning and design of pre-emptive resilience measures for higher risk areas
- Build on existing data platforms and support future local planning



Maximising recycling and value add

Utilising local authority waste and recycling data

Lead: Prof Sean Smith (School of Engineering & CFI)
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Aims:

- Harness and measure the full embodied carbon via non-landfill
- Identify existing dry waste (landfill) which could be recycled which would reduce waste
- Provide underpinning data and analysis to support a future community / household engagement by local authority to recycle more



BIMERR

Develop ICT-enabled Renovation 4.0 toolkit comprising various tools and enforcing semantic interoperability

Lead: Dr Frédéric Bosché (School of Engineering & CFI)
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Aims:

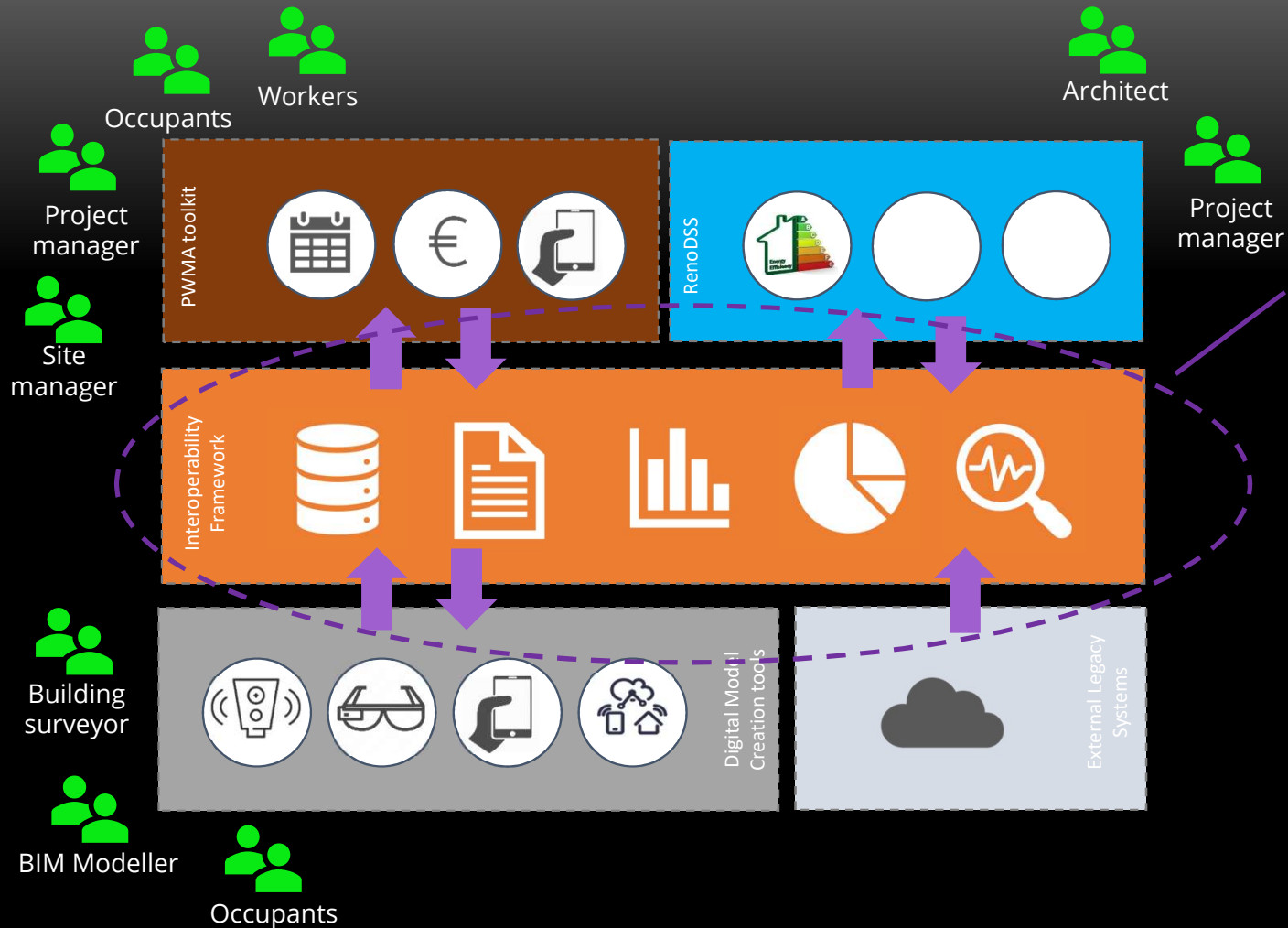
- Tools for capturing existing buildings, design the renovation holistically and conduct the construction
- Enhance digital models of existing buildings that go beyond geometrical information



<https://bimerr.eu/>



BIMERR



Need: Interoperability between heterogeneous data formats, sources, schemas, etc. for data exchange.

Solution: Common data models derived from ontologies

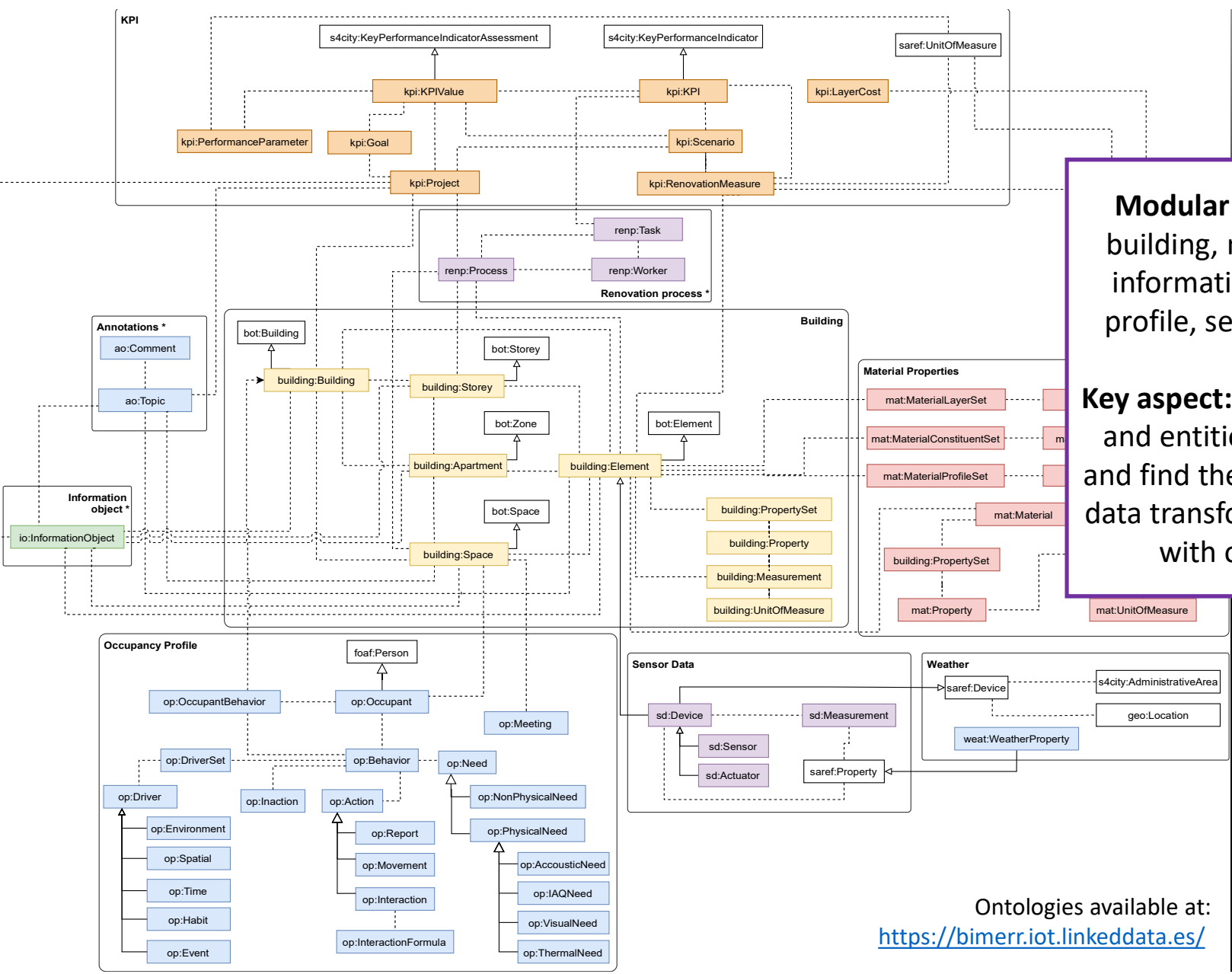


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Modular solution: KPI, project, building, materials, annotations, information objects, occupancy profile, sensor data and weather

Key aspect: find common identifiers and entities to link different data and find the right level of details for data transformation in combination with original file storage



Ontologies available at:
<https://bimerr.iot.linkeddata.es/>



<https://bimerr.eu/>





COGITO

Construction Phase Digital Twin Platform and Tool Ecosystem

Lead: Dr Frédéric Bosché (School of Engineering & CFI)
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Aims:

- Enhance project performance and predictability
- New digital tools to improve process and outcome of Workflow, Quality and Safety.
- With a DT platform and data model ensuring interoperability across various domains



<https://cogito-project.eu/>



COGITO

- **Use cases** to be **supported** by the **ontologies**
 - Workflow management (incl. smart contracts)
 - Construction safety
 - Quality control
- Foreseen **domains**:
 - **As planned**: building, construction site, railways, geometry, time, process, cost
 - **As built**: multi source visual data, Internet of things
- **Challenges**
 - Alignment between current standards
 - Trade-off between semantic description and performance



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POLITÉCNICA



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Thank you