BIMERR

R E N O V A T I O N   4 . Ø

**Design & develop toolkits to support
RENOVATION PROCESS of existing buildings**

RENOVATION 4.Ø

BIMERR

R E N O V A T I O N   4 . Ø

THE MISSION

The mission of the BIMERR project is to design and develop an ICT-enabled Renovation 4.0 toolkit comprising tools for Architecture, Engineering & Construction (AEC) stakeholder support throughout the energy efficiency renovation process of existing buildings. It will enforce semantic interoperability among its own tools as well as with third-party ICT tools to enable seamless BIM creation and information exchange among the AEC community in an effort to boost the rapid adoption of BIM in renovating of the existing EU building stock.

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The BIMERR Newsletters are issued twice a year to report the progress of the project and announce events.

CONTACT US
www.bimerr.eu

- BIMERR is an **EU-funded project** under Horizon 2020, related to the Building Information Modelling (BIM).
- 16 partners from **10 Member States**
- Budget: approx. **7€ million**
- Project duration: **45 months**

BIMERR TOOLS

ARIBFA
Automated BIM model semantic annotation

The **ARIBFA** (Augmented Reality enabled In-situ Building Feature Annotation) tool will be responsible for presenting BIM 3D visualisations and spatially annotated information on site during the renovation process to architects, contractors and building managers through an Augmented Reality (AR) interface.

SCAN TO BIM
Reality Capture

The **Scan-to-BIM** tool is a software solution for the (semi-)automated generation of as-is Building Information Models of existing buildings from reality capture data (mainly 3D point clouds and pictures). The tool deploys innovate data processing techniques, including machine learning, to deliver IFC models that can be meaningfully used for assessing building energy performance assessment and planning refurbishment. The tool is developed using open-source technology and manipulates data in open formats (e.g. E57 and IFC).

PWMA
Workfolw scheduling
On site worker guidance tools
Change management

The **PWMA** (Process & Workflow Modelling & Automation Toolkit) tool provides a set of tools to design, verify, simulate, execute, monitor and analyze the reconstruction process. It orchestrates the tasks of the reconstruction process and provides UI for all the key stakeholders of the process to cover all phases of the reconstruction.

The main scope of the BIMERR Interoperability Framework (BIF) is to ensure seamless and secure data exchange among the individual BIMERR tools and applications, supplying them with all the up-to-date building information they need for their operation. BIF utilizes mechanisms that enable semantic and syntactic interoperability, while enforcing access control policies to prevent any illegitimate building data exchange.

The **BICA** (Building Information Collection Application) tool is a smartphone application enabling building residents to provide complementary information (such as notes and photos) to the already recorded building information in the BIM, thus accelerating the overall collection of data required for the initial renovation scenario modelling process.

BICA
Non-geometry capture

BISP

The **PRUBS** (Profiling Resident Usage of Building Systems) tool adopts obXML as its populated data model, and applying Machine Learning algorithms on IoT data streams provided by a sensor network installed in the pilot sites, generates occupant behaviour profiles that mimic the inhabitants' actions. These profiles are subsequently used to project the building system (e.g. heating/cooling) utilization boundaries that lie within the comfort zone of the residents. BEPE (Building Energy Performance Estimation) module, as a component of the RenoDSS, is responsible for estimating the building energy performance before and after the renovation interventions under examination. It enables the RenoDSS user to explore various what-if scenarios, quickly run energy models (or simulations) to estimate the energy performance and fine-tune the interventions in order to explore the trade-offs.

PRUBS
Behavioral profiling

RENODSS
Renovation scenarios assessment

The **RenoDSS** (Renovation Decision Support System) tool provides an accurate estimation of the energy, cost, and environmental impact trade-offs of alternative renovation scenarios. The estimation of post-renovation energy consumption is based on energy data models, structural and geometrical properties of the building, materials, HVAC systems, residents' usage profile, as well as weather data. RenoDSS also takes the environmental impact of the renovation and the interaction with surrounding buildings into account. All KPIs and details of possible renovation scenarios are shown in an intuitive user interface which enables the renovation designer to select the optimal renovation scenario in terms of costs, energy consumption, and environmental impact.

BIMERR ONTOLOGY NETWORK

The **BIMERR Ontology Network** represents the semantic models that describe the different aspects of building renovation processes (e.g. energy efficiency, occupancy, building information models, etc.). Such models are defined following a modular approach, that is in the shape of a network, in which each domain (KPI, materials, building, etc.) could be reused independently. The ontology network is implemented in OWL (Web Ontology Language) and available in different formats.

The **BISP** (Building Information Secure Provisioning) tool aims to provide data protection, confidentiality and integrity for every dataset that is requested through the BIF.

Building Surveyor/ Auditor

Renovation Contractor/ Worker

Renovation Designer/ Planner

Resident Building Owner/ Manager

BIMERR Interoperability Framework (BIF)

All BIMERR tools