BIM4EEB
BIM based fast toolkit for Efficient rEnovation in Buildings

BIM4EEB Final Conference at BIMWorld Paris
Project results

Paris, FR - April/2022

Professor Bruno Daniotti from Politecnico di Milano presenting BIM4EEB project at the Final conference at BIMWorld Paris.

The BIM4EEB final conference was held at BIMWorld Paris on 5 April 2022. The fair received 10.518 participants from the BIM industry in Europe. The BIM4EEB partners presented the six BIM tools and the BIM Management System (BIMMS) that aims to speed up and facilitate the building renovation process throughout all stages from the design and construction. Three pilot buildings in Italy, Poland and Finland provided the means for testing and validating the developed tools.

After 3,5 years, BIM4EEB partners share the main results of the project; the BIM ontologies, the BIM Management System (BIMMS) and the six BIM tools, the fast mapping toolkit, the BIMeaser, the BIMcpd, the BIMPlanner, the BIM4Occupants and AUTERAS tool.

The consortium was joined by Dimitrios Biliouris, BIM4EEB project Officer at HaDEA at the European Commission. Mr Biliouris explained the role of HaDEA in European funded projects: “We are involved in the full cycle of the project management. We are doing the evaluation of the proposal, the grant agreement preparation and project follow up, and at the end the policy feedback. We take the results of the project and we provide them as a feedback to the European Commission to see if there is a need for further funding in the same sector or different areas. So basically, for each project, depending on the result, there is the possibility of future funding in the same area.”

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Dimitrios Biliouris, BIM4EEB project officer presenting HaDEA and the funding opportunities from European Commission.

Andrea Perego, Innovation Consulting Service director at One Team and BIM4EEB partner reinforced the need of funding to boost the market. “Funding is fundamental to give the possibility for companies of different sizes to have access to this kind of technology.”

Professor Bruno Daniotti, professor at the Department of Architecture, built environment and construction engineering at the Politecnico di Milano, BIM4EEB Project Coordinator, summarised the objectives of the project “Maximize efficiency in time, cost and quality and energy, accelerating the market uptake of BIM” for building renovation. He highlighted the importance of interoperability in the BIM process: “If we don’t think about open and interoperable tools we cannot go on. We cannot depend on one software.”

Interoperability is the main feature in the BIM Management System (BIMMS) developed by BIM4EEB partners led by Davide Madeddu, BIM Consultant, Autodesk AEC Application Engineer at One Team and BIM4EEB project partner. Mr Madeddu explained that the BIMMS is an “open source common data environment that can work for all the [BIM4EEB] tools and exchange data for all the [BIM4EEB] tools. (...) One

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of the main features of the BIM Management System is the user management, the role management and the resource management. (...) All the data change in the BIMMS happens using Application Programme Interface (API) and the result is 70%-time reduction when you exchange data with others."

Davide Madeddu, BIM Consultant, Autodesk AEC Application Engineer on BIM Management System (BIMMS) developed for BIM4EEB project.

The BIMMS is the result of the work on semantic and linked data developed by the Technische Universität Dresden team and the Visualynk team. At the conference Professor Alberto Pavan Associated Professor at the Department of Architecture, built environment and construction engineering at the Politecnico di Milano and BIM4EEB partner, announced "The CEN 442 confirm that the result from BIM4EEB and other sister project (BIM-Speed, BIM4REN, BIMERR, ENCORE and SPHERE) using semantic and linked data will be use to start a new standard about semantic and linked data and verticalization of buildings."

"Architects can benefit strongly from the BIM4EEB toolkit in the process of renovation. The BIM Management System and the tools can save time in the decision-making process during the early stage of the project, make more effective and efficient the exchange of information and make easier the analysis of data facilitating the post refurbishment evaluation", says Larissa De Rosso, Assistant Project Officer at the Architects' Council of Europe, partner in BIM4EEB project.

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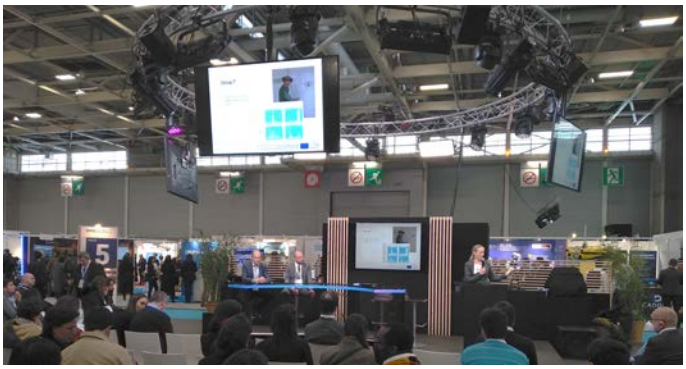
Dr. Eva-Lotta Kurkinen Senior Researcher at RISE and BIM4EEB partner brought the virtual reality glasses and the sensor stick as part of the Fast mapping toolkit to the stage. The tool's main purpose is to easily obtain documentation of the existing building. Not only the geometry, but also information about the pipe location, electricity cables and all hidden elements inside the wall can be detected. The toolkit uses laser scanning to scan the geometry of the apartment creating a point cloud. The point cloud is then loaded onto the Virtual Reality glasses. The sensor stick is used to scan the hidden elements in the wall identified by the four different sensors inside the stick; the temperature at surface, electricity (voltage), capacitance and inductance sensor. The sensor stick and the software to allow the data collection was the main innovation developed for the project.



Dr. Eva-Lotta Kurkinen Senior Researcher at RISE presented the sensor stick as part of the Fast Mapping toolkit. The toolkit was also demonstrated at the BIM4EEB stand at the fair.

The BIMeaser was presented by Markku Kiviniemi, Senior Scientist at VVT and BIM4EEB partner. The tool is designed to support the decision-making process in the early design stage of the renovation process. The tool provides a comparative table on the different building renovation options in which aspects such as operational energy cost, payback time of renovation, summer thermal comfort can be considered and validated in line with the Owner's Project Requirement. “We believe we can dramatically reduce the time needed for energy simulations. ... This is research software which VTT is willing to develop it further.” stated Mr Kiviniemi at the conference.

The BIMcpd stands for BIM Constraint Checking, Performance Analysis and Data Management. The constraint checker looks at finding the recommended location for diffuser, ducts, lighting and sensors in buildings. The performance evaluation is a tool that would allow anyone to evaluate the data quite easily, regardless of the expertise background. The data management creates a structured database. The tool was presented by

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Brian O'Regan Senior Research engineer at IERC develop in conjunction with UCC, both partners at the BIM4EEB project.

Brian O'Regan Senior Research engineer at IERC presented BIMcpd.

According to Andrea Mainini, Assistant Professor at Department of Architecture, built environment and construction engineering at the Politecnico di Milano and BIM4EEB partner leading the demonstration task at Italian pilot building, the "data is important but when there is so many it is difficult to gather some useful information from it. ... [The BIMcpd and BIM4Occupants] tools helped to understand the effectiveness of the renovation approach and if it was positive in a sense to improve the comfort perceived by the user."

"I really appreciate the capability of the tool [BIMcpd] in reading the data coming from the sensor and especially when something is missing to forecast which is the tendency of the data," says Mr Mainini.

"The BIMPlanner is a cloud-based software for detailed planning and tracking of site activities, especially on renovation projects", according to Mr Kiviniemi, leading developer of the BIMPlanner tool. "The target is to improve productivity, reduce the disruption and also provide updated information of where the activities outside are taking place and share this information to other stakeholders in the project." The inhabitants can receive information from BIM4Occupants about the works planned in their flat from the BIMPlanner tool. The link between the two tools is done by the BIMMS which collects information from the correct flat in BIMPlanner and delivers it to the correct inhabitant via BIM4Occupants.

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Markku Kiviniemi, Senior Scientist at VVT presented BIMPlanner and BIMeaser tool at the final conference.

The main purpose of the BIM4occupants tool is to engage inhabitants in the renovation process. This tool is able to record real time data and historic data and use feedback about the inhabitants' comfort. Inhabitants can communicate with the construction company about hazards on the construction site and negotiate a date for renovation works to be done at their apartment. The tool was presented by Andrea Mainini, Assistant Professor at Department of Architecture, built environment and construction engineering at the Politecnico di Milano on behalf of Suite5 team, the tool developer and partner at BIM4EEB project.

Andrea Mainini, Assistant Professor at Department of Architecture, built environment and construction engineering at the Politecnico di Milano presented BIM4Occupants.

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Giuseppina Rita Cristina Tola from Regione Lombardia together with ALER VCMB and Politecnico di Milano team developed the work at the Italian pilot building demonstrating the tools during an actual refurbishment process. Regione Lombardia has 170.000 social housing units, most of them old houses/flats requiring renovation. As a public body, Regione Lombardia is implementing BIM in order to comply with the National regulations in Italy. "The implementation of BIM is an obligation, and we are preparing for it. We are working on guidelines for the BIM implementation in the public sector", says Giuseppina Rita Cristina Tola. The BIM guidelines for the public and private sector will be available at the BIM4EEB website in summer 2022.

Giuseppina Rita Cristina Tola from Regione Lombardia talks about the BIM4EEB role in facilitating the BIM implementation at Regione Lombardia.

Finally, the AUTERAS tool developed by Technische Universität Dresden team was presented in a video. AUTERAS supports building services designers to design Room Automation Systems.

BIM4EEB partners would like to thank the Conseil national de l'Ordre des architects (CNOA) in France for hosting the partners meeting at their office. Special thanks to Mr Stéphane Lutard for sharing his knowledge on the BIM implementation in France and for hearing about the BIM4EEB results.

The BIM4EEB project is a European funded project in research and innovation on the topic of Building Information Modelling adapted to efficient renovation. The project finishes in summer 2022 and gathered partners from Belgium, Finland, Cyprus, Germany, Spain, Sweden, Ireland, Poland and Italy, and was coordinated by Politecnico di Milano, Italy.

Visit BIM4EEB website for more information https://www.bim4eeb-project.eu/ and follow us on LinkedIn and Twitter.

The full conference is available at BIM4EEB YouTube channel.

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