BIM4EEB

BIM based fast toolkit for
Efficient rEnovation in Buildings

D8.5 Report about the validation results by relevant stakeholders

This project has received funding from European Union's H2020 research and innovation programme under grant agreement N. 820660

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D8.5 Report about the validation results by relevant stakeholders

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1.0	24.06.2022	Final and formal review, plagiarism check, submission	B.Daniotti, M.Signorini (PoliMi), G.Canzi (FPM/PoliMi)

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EXECUTIVE SUMMARY

The following report describes the final months of Advisory Board engagement for final validation and collection of feedbacks proving stakeholders' acceptance.

This report does not contain the results of the Key Performance Indicators (KPIs) evaluation for individual tools, already presented in previous deliverable but wants to add broader views from the advisory board on all project developments.

Therefore, simple, and general questions were asked to leave room for suggestions. Omitted from this part therefore are all survey activities previously noted for example in the 3 different demo case workshops

PUBLISHING SUMMARY

The advisory board has continuously accompanied the development of the project, but in recent months it has been particularly engaged in several occasions. On these pages you will find a summary of their responses regarding the results found by the project and their applicability in the construction world. The point of view often reflect the specificity of the individual peculiarities regarding the profession practiced; for this reason, for some concepts, the generality of concepts rather than the specificity of the individual was preferred to be unified, without altering the content.

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1. Introduction

This document describes the engagement of the Advisory Board for the final validation of the project and the collections of suggestions that could open new horizons of development and implementation of the project's results. Below is the path followed for their involvement:

Figure 1: Engagement of the Advisory Board-Last steps

Although the creation of a community of expert of the advisory board has followed several stages the last few months have been the ones for which it has been most called upon, in the various workshop activities at the demo sites but also with specifically designed activities.

2. Description of the AB and last modification

The advisory board was formed following the partners' guidance but with the aim of bringing together different players in the construction supply chain. The final group was structured as follows being an Italian member of RFI (Italian Railway Network) substituted with the president of the Construction Federation. Some of them are part of the Standard Organizations; others are members of Construction Associations, others of Real Estate Groups or Building Managers.

A. Galeotto	Director of Standards at UNI – Italian Standard Body	PoliMi
M. Pola	Innovation Mng - Federbeton Italy	PoliMi
M. Vuolle	Equa Simulation Finland	VTT
M. Rekola	Senate Properties	VTT
N. Milis	Vice-president of the Technical Chamber of Greece	SUITE5
A. Sica	REDO Sgr.	REGLOMB
J. Zawistowski	PSMB - Polish Association of Building Managers	PROCHEM
D. Johansson	Lund University	RISE
M. Weise	AEC3 Deutschland	TUD
L. Perissich	Federcostruzioni	PoliMi
B. Ingelaere	Dep. General Director at WTCB-CSTC-BBRI	ACE-CAE

Figure 2: The Advisory Board

3. The kit organized for the last survey

The validation regarding tools has been developed during the workshop described in D10.12. During those workshops specific survey activities have been developed to validate the tools. Following that experience a new opportunity has been investigated to enlarge the vision on continuing the project. A document summarizing the most explanatory videos of the project was distributed to the Advisory board and they were then invited to answer a series of questions.

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Milan, May the 6th

Dear Advisory Board member,

As a participant of the Board, we would like to thank you for your involvement in the BIM4EEB project. As part of the final developments of the project, we would like to invite you to participate in an online meeting on Monday 16th May at 10:30 (CEST).
In this meeting we would like to hear your thoughts and discuss the three questions below:

1. Do you think BIM is a methodology that can positively influence the construction world considering the increasing goals of sustainability and energy saving?
2. How do you think BIM4EEB will affect the world of construction? Do you think we should go for more and more diffusion to allow an improvement of the whole process?
3. If you think about its further development, in which phase of the building process do you think BIM should be more present?

If you prefer and/or you are unable to attend the meeting, you can send a written response for these questions by replying to this email. The deadline for a writing reply is on the 16th May.

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If you want to review some of the tools we have created, please access BIM4EEB webpage https://www.bim4eeb-project.eu/the-project.html, click on the link provided for each tool and watch the video available. You can find more video at BIM4EEB YouTube channel https://www.youtube.com/channel/UCq_-Wx-f1TWQoZz-iMBL3Yw

Along with this you can also read the project deliverables at the webpage https://www.bim4eeb-project.eu/reports.html

Sincerely,

The coordinator
Bruno Daniotti

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Figure 3: The kit to inform the Advisors

3.1. Web pages offered to Advisory Board members

According to the invitation partners were asked to look at the pages of the site to review the tools again and the pathway taken for their validation by addressing them principally to the website through the fruition of the pages and videos on YouTube channel.

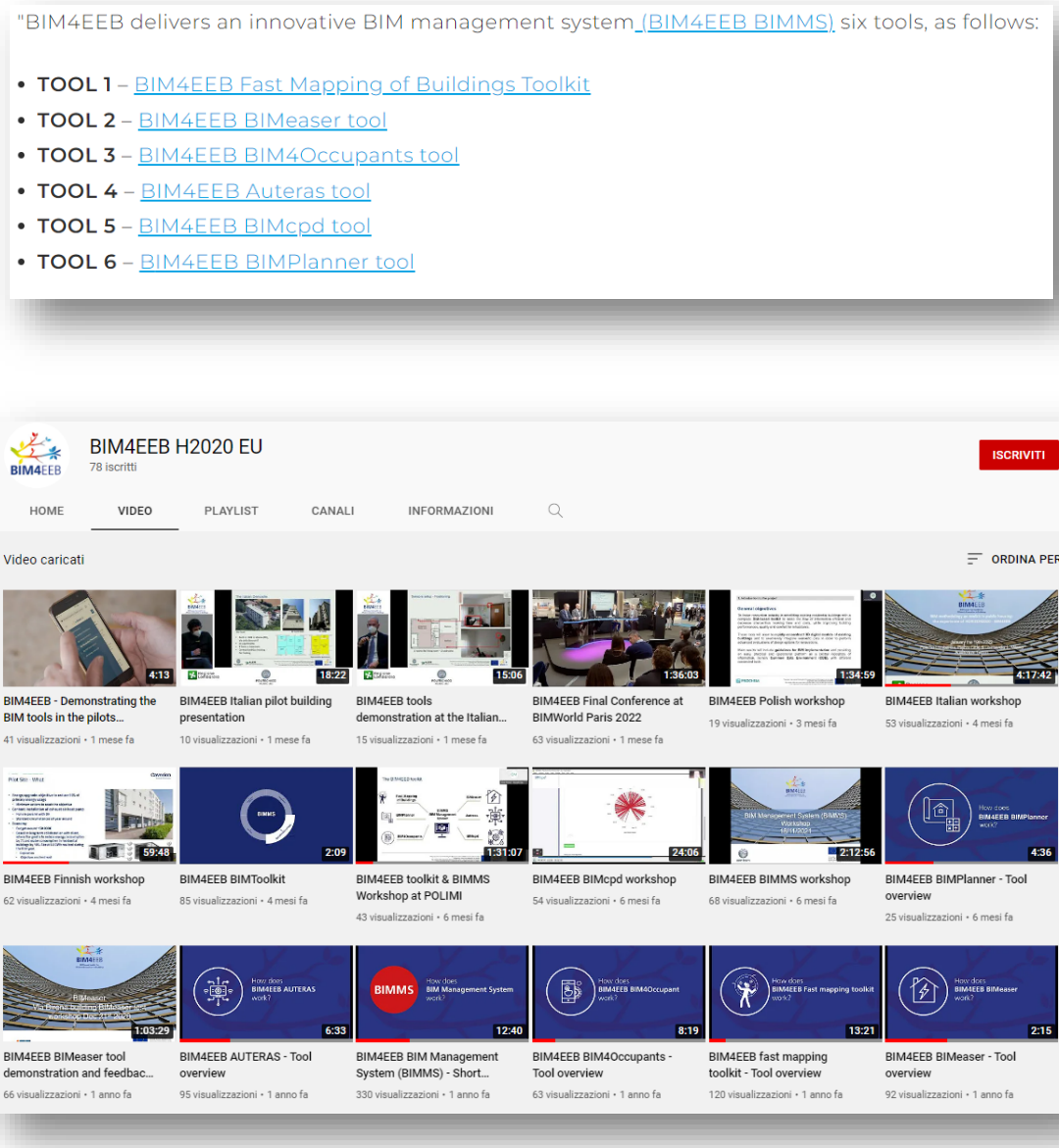

Figure 4: The informative tools

Specific links were provided to validation videos and experiences in the channel for each member of the advisory.

4. Results

Members of the advisory board were all asked the same three questions to get a 360 view on the issues posed, given the different profiles and origins of the members. Two members were not available for reply.

4.1. BIM and BIM4EEB

The first question is more general than the others and evaluates the awareness of the Advisors related to terms linked to BIM in general. It represents a sort of introduction of their thinking to understand relations with the next replies.

Do you think BIM is a methodology that can positively influence the construction world considering the increasing goal of sustainability and energy saving?

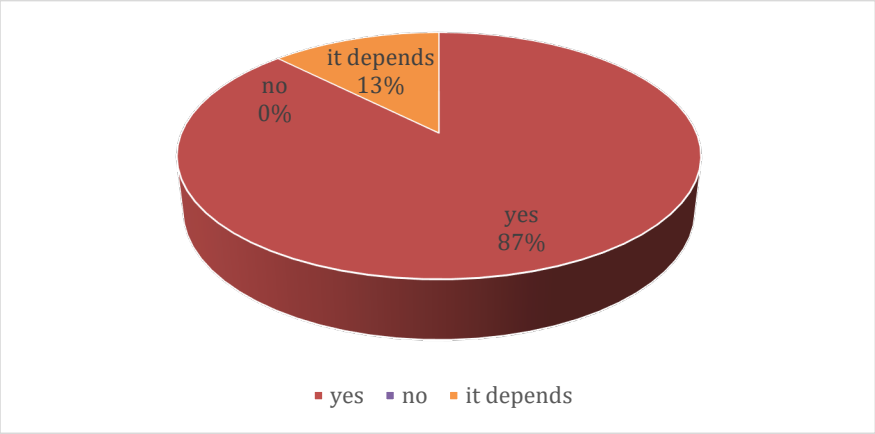

Figure 5: Can BIM positively influence?

The responding partner -depends- believes the question should be asked primarily to a target audience of residents and/or owners.
There are some recurring words and adjectives in the answers given when refered to BIM in general or to BIM4EEB project as below described:

BIM: powerful, with potential, necessary, collaborative, a must, rasing awareness and vision, needed to be experienced, manging data, multy disciplinary sharing, eanbling interoperability, improving circular economy, developing smart systems, developing sustainability awareness.

BIM4EEB: tools, smart tools, raising awareness, raising awareness on sustainability.

An interesting and precise point of view is here reported: " The construction sector meets ever increasing requirements and business challenges, which risk to endanger the affordability of constructions. A first option could be to lobby to diminish requirements and goals. An utterly wrong attitude, endangering the challenges of climate change, circularity etc.! The other solution is to increase the productivity of the sector, which has been stagnating and seriously lagging behind the other industrial sectors. With profit margins of less than 3 % compared to all kind of failure costs1 (estimated on average at more than 10 % of the building cost), there is room to decrease costs and increase profit margins. And then even the rise in costs due to increasing requirements and goals of sustainability, circularity, energy saving, etc. can (at least partially) be compensated. There is now also a stronger focus on the power of BIM-based collaboration with optimised data and information exchange. Recent standardisation created a

framework defining “Exchange Information Requirements (EIR)” for a certain purpose and milestone (use case). The computer readable implementation “Information Delivery Specification (IDS)” allows for an automatic check whether a model complies with the EIR for that use case. Editing the EIR (and its IDS) in Europe for the purpose of evaluating (at a certain milestone of the project) the circularity design, LCA, energy performance, acoustics, etc., will allow to use the model to optimise sustainability and energy performance via dedicated simulation tools and the correctly stored data (data dictionaries !). Circularity requires that the data in the model will still be available when the building will be destroyed (material and building elements inventories). In that way “Open BIM” is important and the EIR should take in account the requirements for a correct IFC-export.”.

4.2. BIM4EEB and its influence in the AEC sector

The second question refers to the BIM4EEB's placement in the AEC sector.

How do you think BIM4EEB will affect the word of construction?

In the answers the advisors point out the weaknesses of the AEC sector as possible point on which BIM4EEB should intervene to improve it with its action. These weaknesses regards

- the fragmentation of the market, of the companies, of the producers of component
- the lack of large companies
- the lack of an economic policy intended for innovation
- the lack of systemic organization of the AEC sector,
- the different languages used by the different contracting stations
- the lack of standardization
- the lack of a real interoperability among platforms

The action of BIM4EEB will develop as a useful tool for the transformation of many of these fragility points through the possibility to

- intervene in the process in a systemic way,
- the ability to foster information
- interoperability
- the provision of consensus-based tools for an effective management of information
- the offer of operational tools to simplify the approach to the planner
- a standardization of the languages and software

As a note to watch out for is highlighted the need to have a good support and maintenance of the tool. A note reiterated several times is that: “BIM is also becoming important in public procurement because it is compulsory in several Member States. This trend will continue and BIM utilization in PP will grow.”

Here reported two main answers:

1-The better the different tools could interact based on exchange formats and APIs the more flexibility there is for single stakeholders to select their tools and to use always the best too for a given purpose.

The BIM4EET project has demonstrated this idea of connecting different tools and stakeholders to manage the process through common environment (BIMplanner tool) very well. For the moment maybe not all the aspects of the user interfaces look super easy to quickly comprehend but the overall idea is there and details can be developed further. I hope this has impact to the world of construction if not resulting a commercial tool itself, also inspiring further development into this direction in existing and to be software.

I hope the project will give a boost into use of BIM in renovation, which still is a bit less than in new building. In the future, partially already, we also have lots of buildings that have been designed and delivered with BIM, and there the starting point for renovations is totally different than used to be.

2- BIM4EEB results aim at developing a BIM-based toolset to support the different building related stakeholders on their decision making. The incorporation of the core platform that stand as the lingua-franca among the different data attributes enables the plug and play adaptation of the different data sources that are expanding within the building environment. The state-of-the-art technologies/tools developed in the project and smoothly integrated with the core platform provide evident value to the different business stakeholders of the building. It is clear that the different solutions developed will establish the improvement of the different processes during and post renovation while the core platform will aim to facilitate the development and incorporation of new services and apps.

4.3. Future developments

The third question requests suggestions on future project development and possible implementations of the project.

If you think about its further development, in which phase of the building process do you think BIM4EEB should be more present?

Some of the answers focus on the further development, others more on the AEC phases of interaction.

Here reported some answers:

1. *While BIM4EEB project and tools are effectively tackling the different phases of the building management process, there is still place for further development. At the core of the platform, further expansion of the information model may be considered (and can be easily handled taking into account the live management of the project ontological model) in order to incorporate additional or new concepts from the building environment. In addition, different information exchange means may be supported in order to ensure real time access on the information. On the other hand, the field for further development of application is vast, indicatively applications related to real time building performance of the building, applications targeting time and cost management and optimization for construction companies etc…*

2. *Regarding further development, it might be useful to also include LCA optimization of different renovation alternative. The indoor environment is already considered but can be further developed with risk of moisture problem and bad indoor environment due to spread of unwanted substances in the ventilation system. Different quality checks are important and also the purpose of the renovation. It is important to do the right things. Fire safety is another aspect that is important to deal with when renovating buildings.*

3. *At the moment BIM is the most present during design and construction from the detailed design phase onward. The handover from building project to asset management is still vague and the use of constructed models too little during the FM phase. There BIM should be more present but*

the model and data of interest in the FM process is actually different that the model and data during construction, so a phase of transforming the model delivered from the project into a FM model would be needed and is still struggling.

There is still room for more active BIM use also in the starting phases of property development and design. BIM can support the visualization and communication of ideas and intentions to possible users and investors. There the model information is not yet in a crucial role. "Virtual prototyping" can and should be also used to develop functionality of buildings. There could be potential for better understanding the space needs and ways of using the building also beyond hospitals or complex industrial processes where this kind of evaluation and user driven design now merely takes place.

4. *While BIM over the last couple of years has managed to acquire quite a wide audience of users in the design phase of constructions, there still is a lack of use of it in the construction as well as in the management phase. These 2 phases are very important to ensure that all the benefits of BIM can be exploited and, in my opinion, should be specifically targeted by further actions/developments of the project.*

5. *BIM is still mostly used for geometrical collaboration in the design and construction phases. It should be in all "use cases" and milestones of the building design, the construction process, the building use and facility management and finally in its transformation or demolition (as to "the circularity principles"). Moreover, the BIM-information should link (with all the security and privacy measures applied) in urban city modelling, the smart city approach).*
   Then there are of course the ecological challenges like climate change, LCA and circularity…
   Building information Modelling can be the indispensable tool to allow meeting these challenges.

6. *The possibility to use the model and its (linked) data in combination with technological holistic software simulation tools is next (r)evolution of BIM. It is yet possible to import the data (mostly just geometrical) into separate simulation tools that have their own data for materials and building elements. So the evaluation has to be made successively for each technological discipline, each time using separate specific technological data for an object (e.g. a thermal insulation database linked to the energy simulation program, a separate acoustic database for acoustic simulation software… What is needed is the linking of multitechnological data to objects within the model, allowing holistic simulations.*

5. Future interaction with stakeholders – Lesson learnt

The variety of the advisory board group was an undoubtedly advantageous choice for observing multiple aspects of the project. However, this may prove to be a complication in describing some purposes especially of the tools intended for users other than those represented by the individual board member.

In the future it would be useful to organize review sessions participated by all components with exchange of opinions among immediate advisory members to dissect immediate issues and criticalities.

A second point concerns the distance between the stakeholders and the technicalities of the project, except in a few cases. These are often prominent personalities who are not in technical roles offering an expanded view of the topic, but often not specific.

In the future, similar personalities could be chosen but accompanied by members of the same group with technical qualities also who are willing to enter into the consistency of the project.

The advisory board has sometimes struggled with requests for active cooperation, responses to questionnaires, requests for suggestions. It is useful to present at the beginning of the project a timetable of the activities that will involve them, making them participants from the outset in the effort that will be required from them.

6. Bibliography

[1] BIM4EEB 2022, D8.2 Report on demonstration in Italy, public report

[2] BIM4EEB 2022, D8.3 Report on demonstration in Poland, public report

[3] BIM4EEB 2022, D8.3 Report on demonstration in Finland, public report