



BIM-based EU -wide Standardized Qualification Framework for  
achieving Energy Efficiency Training

## **D4.4 – BIMEET Platform Testing and Validation Report**

<b>WP 4</b>	<b>Leader: LIST</b>
<b>Task 4.4</b>	<b>Leader: LIST</b>
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## Abbreviations

ALO	Achieved Learning Outcomes
BEM	Building Energy Model
BIM	Building Information Modelling
CA	Consortium Agreement
DoA	Description of the Action
EE	Energy Efficiency
EPBD	Energy Performance Buildings Directive
EPC	Energy Performance Certificate
EQF	European Qualification Framework
GA	Grant Agreement
HOTS	High Level Thinking Skills
ICT	Information and Communication Technologies
ILO	Intended Learning Outcomes
KSC	Knowledge – Skills – Competencies
LO	Learning Outcomes
LOTS	Low Level Thinking Skills
Mx	Milestone date designating the start of a given task
My	Milestone date designating the end of a given document delivery deadline
PC	Project Coordinator
PSC	Project Steering Committee
QA	Quality Assurance
RIBA	Royal Institute of British Architects
RTO	Research and Technology Organisation
TAM	Technology Acceptance Model
TUI	Tangible User Interface
ToC	Table of Content
UAS	Universities of Applied Sciences
WP	Work Package
WPL	Work Package Leader

## **1 Executive summary**

The deliverable 4.4. is dedicated to the validation of the BIMEET tangible application. The validation protocol includes a presentation of the application during a workshop and the collection of feedback from attendees based on a survey questionnaire inspired from Technology Acceptance Model questionnaire (TAM3 (Venkatesh & Bala, 2008)). The researchers have consequently analysed the perceived utility and usability of the application. The first feedback is very promising. The application seems to be easy to use, very enjoyable, and well adapted to support job-related tasks. Nevertheless, the use of the application in a real context would be very useful for collecting more accurate ratings.

## 2 Introduction

This deliverable is dedicated to the assessment of the BIMEET tangible application. The deliverable describes the protocol we used to assess the application. First, we presented the application during the BIMEET workshop organized by INES and given in Chambéry (France) on February 21, 2020. Then, we sent a web questionnaire to the attendees to collect their feedback. This survey was inspired from Technology Acceptance Model questionnaire (TAM3 (Venkatesh & Bala, 2008) and dedicated to the evaluation of usability and utility of the application. This report presents the scenario we used during the workshop, as well as the analysis of the questionnaire's responses.

## 3 Workshop presentation

In the following document we describe the user scenario presented to attendees during the BIMEET workshop organized by INES and given in Chambéry (France) on February 21, 2020. About 35 professionals with different profiles participated to this workshop: trainers, engineers, architects, researchers, etc.

We presented the actual application on one of our tangible tables, which we transported to Chambéry specifically for this event. It was thus possible for the gathered experts to get a very precise idea of which information is available in the system and how to interact with it. INES created a short video teaser (<https://vimeo.com/396915894>) of the user scenario presented during the workshop.

The user scenario was started by presenting the tangible table, briefly explaining that the table replaces classical user interface devices such as the mouse and keyboard, thus abolishing the control monopoly inherent to these devices and instead gives multiple users around the table the possibility to interact simultaneously with the application by manipulating physical objects placed on the table. By doing so, we aim to lower the accessibility and acceptance hurdle of computer systems, leveraging the fact that human beings are used to manipulate physical objects. Users are able to explore available data and to test different hypothesis *together*, brainstorming and discussing while doing so. The tangible table thus no longer is only a technological tool but becomes a catalyst stimulating group dynamics and fostering collaboration.

Next, we were setting the stage and the context in which the demo would take place. Users gathered around the table were asked to imagine themselves as team members of a hypothetical training institution, wishing to define a new energy efficiency related BIM training. We then postulated that, as a training institution, we would be interested in knowing a.) the composition of the potential audience our training is targeting and b.) which trainings are already available and which learning outcomes they do cover. We then proposed to use the tangible table to find answers to those two questions.



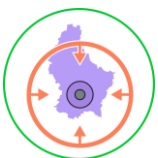
Figure 1. Demonstration during workshop

### 3.1 Interactive Map



We presented the tool we've created as a special kind of interactive map, which can be manipulated via specific objects, such as the Zoom object, allowing to zoom and pan the map, or to overlay other datasets by placing specific object on the table. We illustrated this by placing the **Territorial Units** object on the table, overlaying the OSM (Open Street Map) map with the boundaries of European countries. We also showed that we could directly interact with shown data by touching individual countries with our fingers, the respective countries being highlighted in turn. People are familiar with interactive maps, mostly through web-based maps such as Google Maps and OpenStreetMap integrated in various Online Platforms, such as Booking.com for instance, using maps as a *canvas* for displaying geographical locations of available hotels. It thus was easy for the gathered users to understand why we'd chosen the same approach to locate AEC professionals and trainings.

### 3.2 Composition of target audience



We explained, that our repository currently only contained data of existing AEC professionals for Luxembourg. We thus proposed to zoom in onto Luxembourg. Even though we could have achieved this by using solely the Zoom object, it would have taken multiple zoom and pan operations to achieve the desired map section. We thus created a dedicated **Zoom In on Luxembourg** object, immediately resulting in the required map section, hence preserving presentation flow.

We next placed the **Professionals** object on the table, showing depending on its orientation, the location of all **Architects, Construction, HVAC, Facility Management** and **Consulting Engineering** companies in Luxembourg. Each individual company appears as a coloured dot, the size of the dot being proportional to the number of employees. Companies too close to each other to be properly displayed are grouped into clusters of companies, displayed using a dedicated cluster symbol. We cycled through the different activity types, explaining the particularities of Luxembourg, explaining the high concentration of companies in and around Luxembourg City, the country's capital, and the lower concentration in the more rural north of the country.





We next showed that, by combining data about Professionals with boundaries of local administrative units (municipalities), we could produce an activity density map of Luxembourg, colorizing individual municipalities depending on the number of professionals inside its boundaries.

After having shown how to manually explore potential target audience composition for a given area, we introduced our more automated approach integrated in the application. For this we suggested that our hypothetical training institution wishes to organise a training in **Arlon**, a town in Belgium close to the Luxembourgish border. We placed the Region of Interest object on the table, moving the crosshair at the tip of the object over the city of Arlon.



We next placed the **Target Audience** object on the table, displaying a number of concentric arc graphs, one graph per **Role** as defined in the Learning Outcome matrix. We explained that we mapped the individual activity types of our AEC professionals in the repository to the corresponding roles in the matrix.

We next touched the crosshair with our finger, selecting the location as the origin of our Region of Interest, state which is visually reflected by a *thumbtack* appearing at the given location and the map being masked, except for a small region around the origin. By placing the finger on the little **Radius Tab**, which is draggable, we adjusted the radius of the region of interest to a radius of approximately 35 kilometres. The arc graphs of the Target Audience object are updated as soon as the radius tab is released. In the given example (see **Error! Reference source not found.** in D4.2), it appears that the **Architect** role has the highest head count, followed by **Building Services** and **Structural Design**. The other roles appeared to be proportionally under represented. We explained that under those circumstances, we should perhaps not target those roles and that it might perhaps be wiser to focus on the three better represented ones.

### 3.3 Available trainings



Now that we have identified the target audience for our new training, it is time to have a look at already existing trainings. We pointed out that the current offer of energy efficiency related BIM trainings is very low. In February 2020, only 19 trainings had been identified, with only 2 for Luxembourg. For the sake of the demo, we thus proposed to zoom back at European level, giving us a complete overview of all currently available trainings, knowing that this somehow breaks our storyline. We shortly placed the **Zoom Out on Europe** object on the table, thus changing the map section to display all European countries.

We next place the **Training Locations** object on the table, showing the training locations of all currently available trainings. To resume our storyline, we suggested to the gathered users that our training institution now wishes to host a training in **Paris**, and that we're targeting a region of interest with a radius of approximately 780 kilometres. We repeated the operation we did for the target audience, i.e. moving the Region of Interest object over the city of Paris, touching the crosshair to select Paris as the origin of the region and dragging the Radius Tab until we've reached the





desired radius. We next emphasised that we collected data about available trainings with a very high level of granularity, allowing us to extract a wealth of information.



To illustrate this, we first placed the **Profile Coverage** object on the table, showing a coxcomb plot where each slice represents an individual **Profile** as defined in the Learning Outcome Matrix, the length of the slice being proportional to the number of trainings targeting the given profile. In the given setting for instance, we were able to show that certain profiles are fairly well covered, however, three profiles stand out as being under represented. In the **Structural** design role for instance, the **Assistant Designer** is covered by no training at all. In the **Maintenance** role, the **Operator** and **Caretaker** profiles appear to be covered by one single training. The **Worker** profile in the **Construction** role has the same low coverage.

We next placed the RIBA Stage Coverage object on the table. Even though visually comparable to the previous object, this object focuses more specifically on the RIBA stages covered by the various trainings. We were again able to show, that for the current region of interest, most trainings cover the centre RIBA Stages from **Concept Design** (Stage 2) up-to **Construction** (Stage 5). The very early stages as well as the later stages starting with **Handover and Close Out** appear to be less frequently covered.



We continued our narration by pointing out that, even though we now have a pretty good overview of who the different trainings are targeting and which RIBA stages they do cover, we don't know yet which learning outcomes they do address and at what maturity level. We next explained that the actual Learning Outcome Matrix compiled in the scope of the BIMEET project was quite comprehensive, given its 272 individual entries. We described the hierarchical organisation of the matrix, with its high-level learning outcomes organised by roles and their respective sub learning outcomes. To illustrate this, we next placed the **Learning Outcomes** object on the table, showing first of all the central ring of buttons allowing to select a Role. We selected one of the Roles by touching it, thus bringing up the high-level learning outcomes defined for the given role. We pointed out that each learning outcome is represented as a pair of slices. One slice shows the **pre-requisite**, i.e. the maturity level a potential attendee needs to possess to attend the training, while the other slice shows the expected **outcome**, i.e. the maturity level a potential attendee is expected to achieve after completing the training. We continued our elaboration by providing more insight in how to interpret the displayed information. For instance, learning outcomes addressed by multiple trainings show the distribution of maturity levels as a simplified *box or whisker plot*, i.e. displaying the *minimum*, *maximum* and *median* value. By doing so, we as training designers are able to decide which maturity level to aim for should we plan to address the same learning outcomes in our training as well.

We ended our presentation at this point because the training design part of the application was not fully functional yet when the workshop took place. Also, the integration of the recommender engine was not completed by then.

## 4 Measurements

In order to collect feedback from workshop attendees and based on the TAM3 - Technology Acceptance Model (Venkatesh & Bala, 2008), we focused on the following measures and indicators, collected through a questionnaire.

Table 1. Measure and description

Measure	Description
Perceived usefulness	The degree to which a person believes that using the BIM4VET application would enhance his/her job performance (Davis, 1989). This measure is evaluated in a questionnaire provided at the end of the experiment.
Job relevance	The degree to which an individual believes that the BIM4VET application is applicable to his or her job (Venkatesh & Davis, 2000). This measure is evaluated in a questionnaire provided at the end of the experiment.
Output quality	The degree to which an individual believes that the BIM4VET application performs his or her jobs well (Venkatesh & Davis, 2000). This measure is evaluated in a questionnaire provided at the end of the experiment.
Result demonstrability	The degree to which an individual believes that the results of the BIM4VET application are tangible, observable, and communicable (Moore & Benbasat, 1991). This measure is evaluated in a questionnaire provided at the end of the experiment.
Perceived ease of use	The degree to which a person believes that using the BIM4VET application will be free of effort (Davis, 1989). This measure is evaluated in a questionnaire provided at the end of the experiment.
Perceptions of external control	The degree to which an individual believes that organizational and technical resources exist to support the use of the BIM4VET application (Venkatesh et al. 2003). This measure is evaluated in a questionnaire provided at the end of the experiment.
Perceived enjoyment	The extent to which the activity of using the BIM4VET application "is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use" (Venkatesh, 2000, p. 351). This measure is evaluated in a questionnaire provided at the end of the experiment.
Objective usability	A "comparison of systems based on the actual level (rather than perceptions) of effort required to completing specific tasks" (Venkatesh, 2000). A usability score is calculated based on the success rate.
Behavioral intention to use	"The degree to which a person has formulated conscious plans to perform or not perform some specified future behavior" (Warshaw & Davis, 1985) related to the use of the BIM4VET application.
Success rate	Percentage of the tasks that could be completed.
Task time	Total time to accomplish the tasks

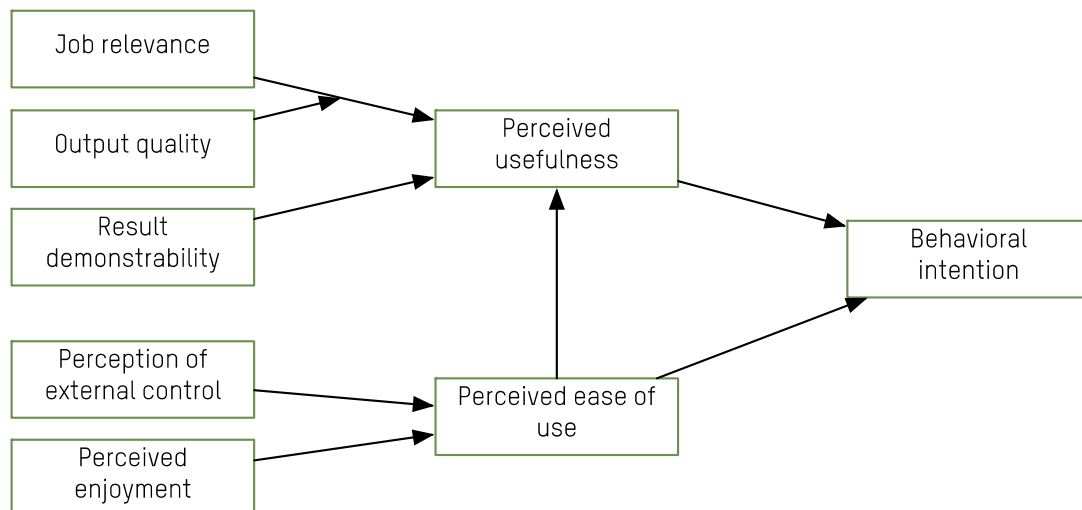
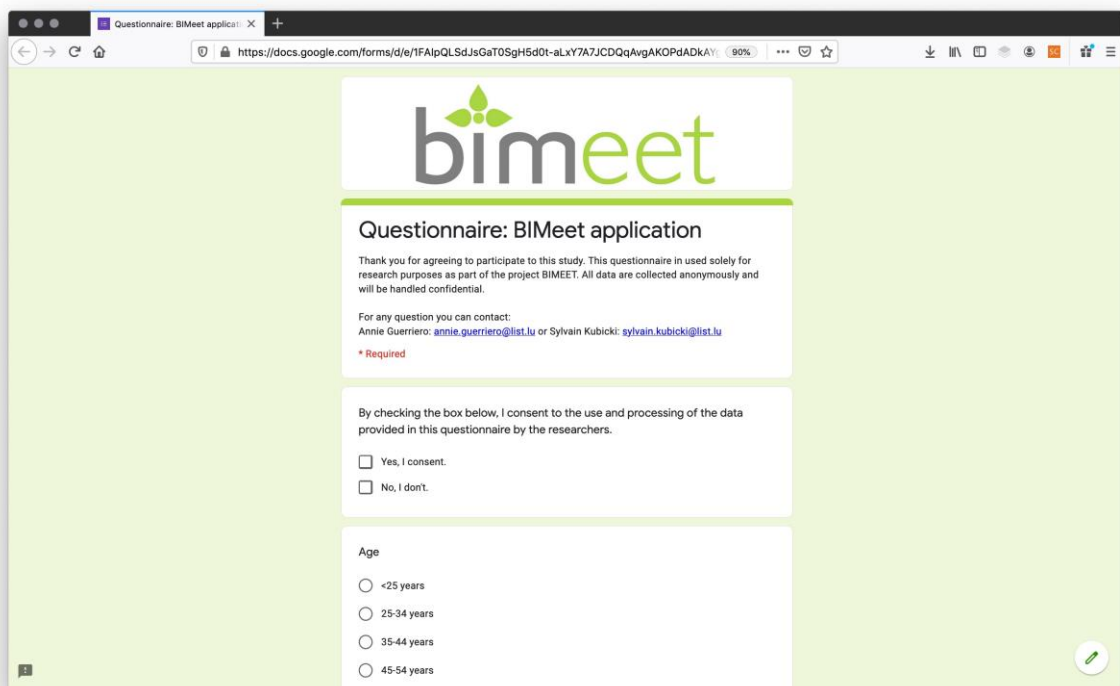


Figure 2. Adaption of the Technology Acceptance Model 3

After the workshop, participants received a questionnaire by mail (see Figure 3 & Annex). Each “measure” is linked to several questions (i.e. 3 or 4 questions). Results are presented in the next section (see section 5).



The screenshot shows a web browser displaying a Google Forms questionnaire titled "Questionnaire: BIMEET application". The form includes the BIMEET logo, a thank you message, contact information for Annie Guerriero and Sylvain Kubicki, a consent section with checkboxes for "Yes, I consent" and "No, I don't", and an "Age" section with radio button options: "<25 years", "25-34 years", "35-44 years", and "45-54 years".

Figure 3. Web questionnaire for data collection

## 5 Questionnaire & analysis

The questionnaire has been sent to the attendees of the workshop excluding the researchers involved in the development of the application (i.e., About 30 persons). At total 9 attendees of the workshop have returned the questionnaire, some of them just partially.

### 5.1 Participants

Participants were between 25 and 55+ years old. Most of them were between 35 and 44 years old (see Figure 4).

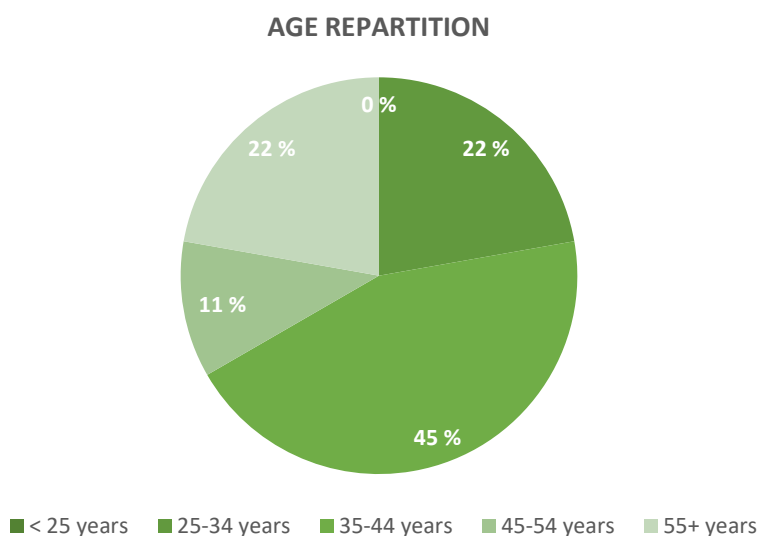


Figure 4. Age repartition

56 % of men and 44 % of women have answered the questionnaire (see Figure 5).

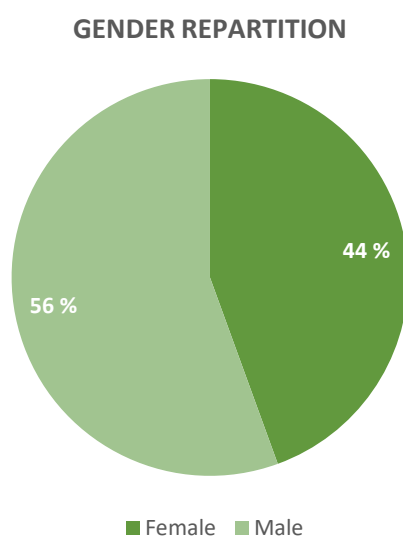


Figure 5. Gender repartition

For the question related to the position of the respondents, multiple answers were allowed. We have received answers from 5 training experts, 3 researchers, 1 project manager, 2 architects and 1 training project manager (see Figure 6).

The experience in training design is well represented amongst the respondents and that is an important point for the collection of relevant feedback on the BIMEET platform quality.

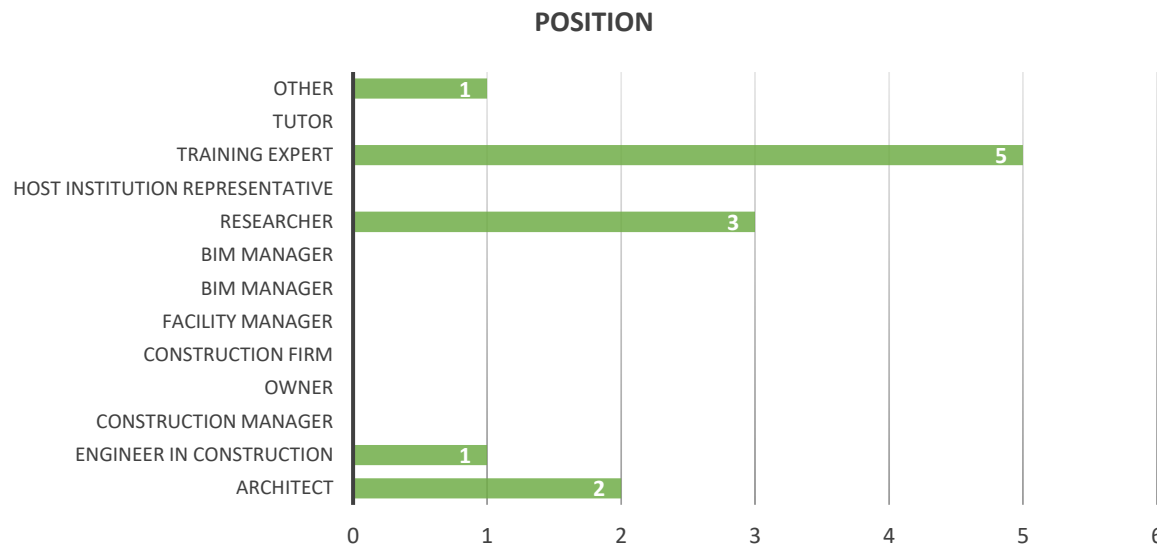


Figure 6. Position

The experience of the respondents in construction is relatively high. 44% of the respondents have more than 10 years of experience, 45 % have between 3 and 5 years of experience and only 11% have between 0 and 2 years of experience in construction (see Figure 7).

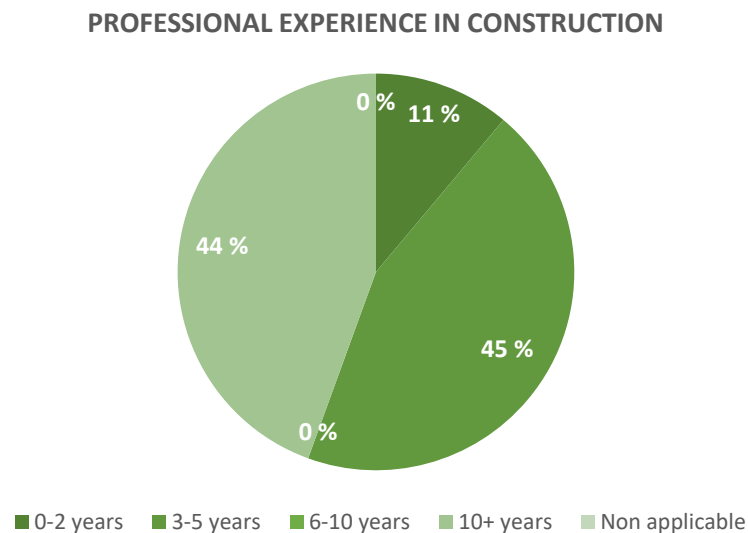


Figure 7. Professional experience in construction

The respondents have a certain expertise in BIM: 11% are experts, 22% are proficient, 11% are competent, 22% are advanced beginners and 34% are novice (see Figure 8).

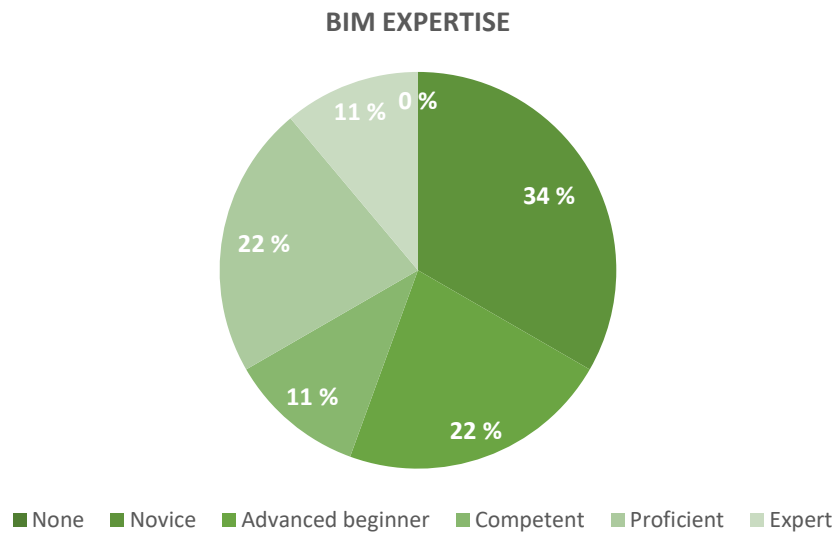


Figure 8. BIM expertise

The respondents have a good expertise in energy efficiency: 11% are proficient, 45% are competent, 22% are advanced beginners, 11% are novice, 11% have no expertise (see Figure 9).

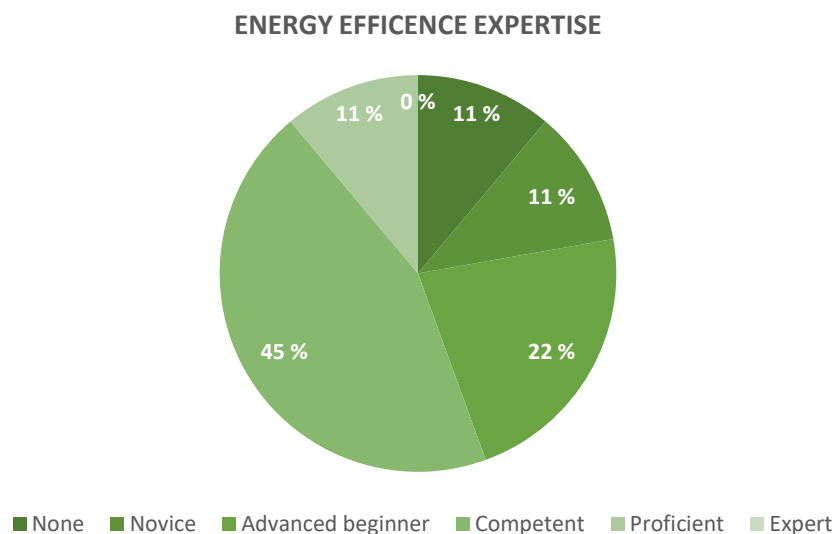


Figure 9. Energy efficiency expertise

## 5.2 Perceived ease of use

With an average of 4,03 within a rating scale from 1 to 5, the score for perceived ease of use measure is very high (See below (Figure 10) the repartition of the answers for each of the 4 questions). Most of the workshop attendees have perceived the application as a very easy to use application.

### PERCEIVED EASE OF USE

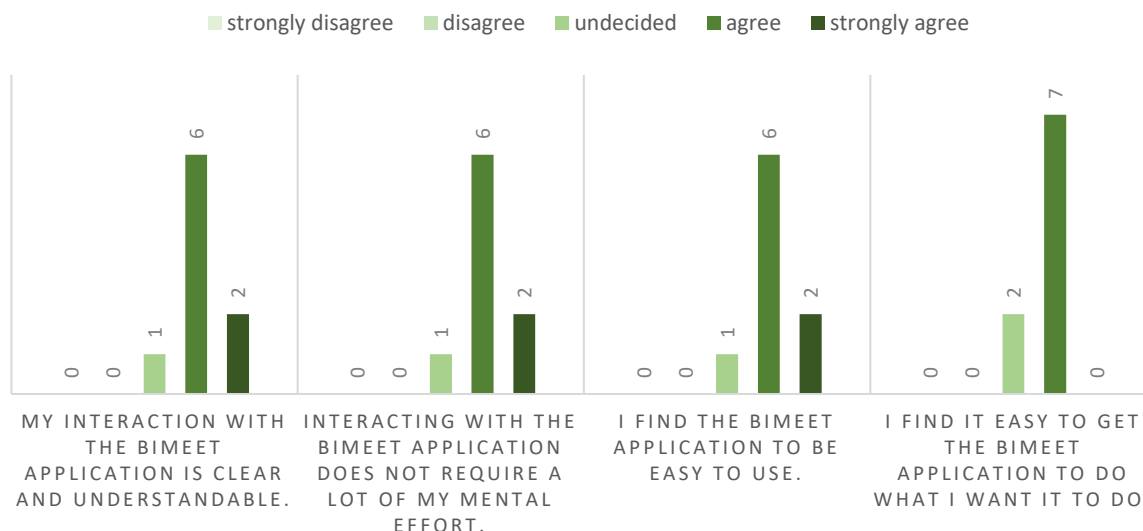


Figure 10. Perceived ease of use

### 5.3 Perception of external control

With an average of 3,67 within a rating scale from 1 to 5, the score for perception of external control measure is relatively high (See below (Figure 11) the repartition of the answers for each of the 4 questions). It seems that for some of the attendees, it is not clear if the application could be compatible with other applications. Some feedback has pointed out that actual use of the application in a real context could be useful for providing more accurate ratings.

### PERCEPTION OF EXTERNAL CONTROL

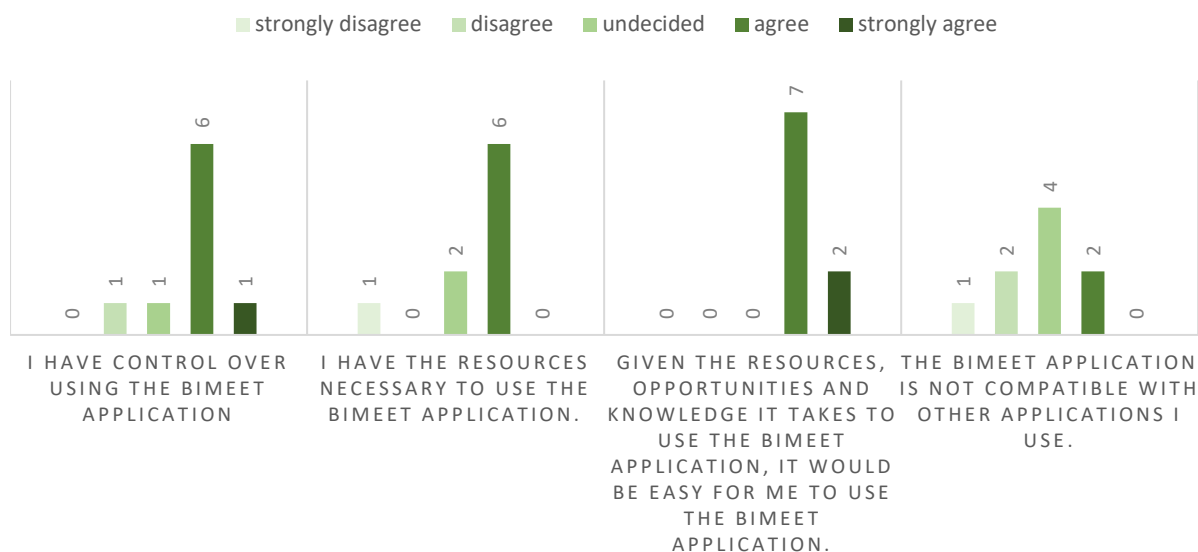


Figure 11. Perception of external control

## 5.4 Perceived enjoyment

With an average of 4,37 within a rating scale from 1 to 5, the score for perceived enjoyment measure is very high (See below (Figure 12) the repartition of the answers for each of the 3 questions). The use of tangible table associated with tokens contribute to an enjoyable and pleasant application.

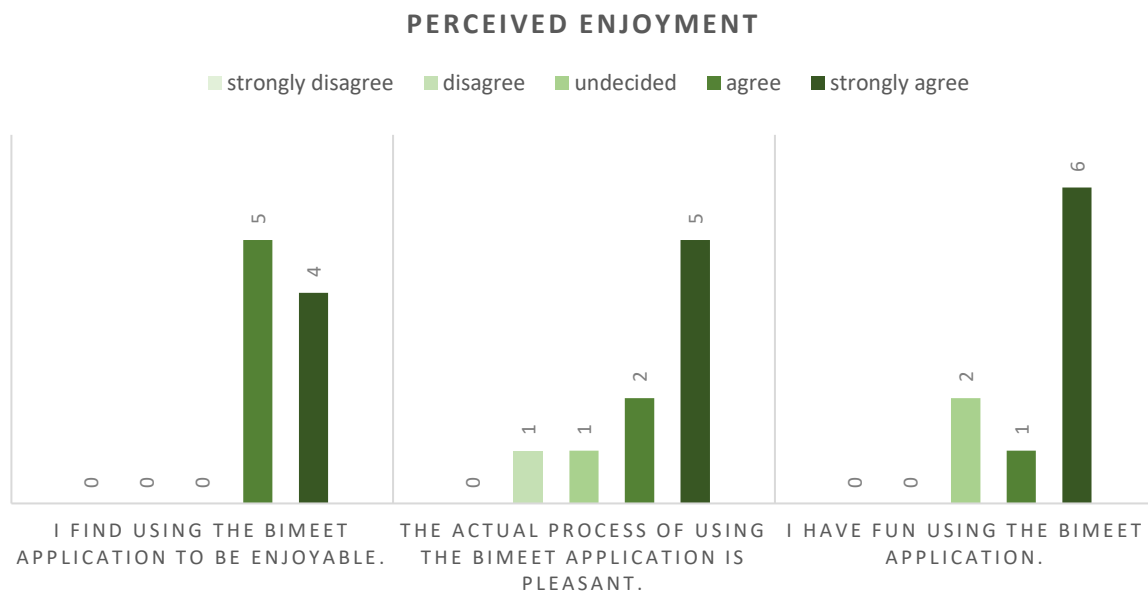


Figure 12. Perceived enjoyment

## 5.5 Output quality

With an average of 3,93 within a rating scale from 1 to 5, the score for output quality measure is high (See below (Figure 13) the repartition of the answers for each of the 3 questions). The quality of output is really appreciated by respondents. 6 of them have rated the results from the application as excellent.



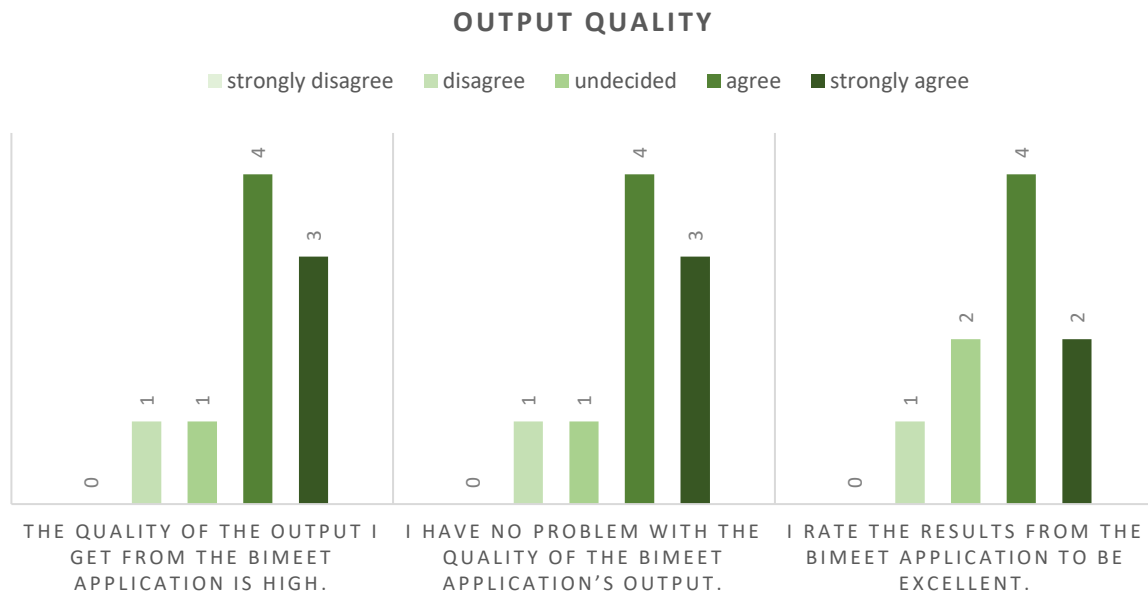


Figure 13. Output quality

## 5.6 Result demonstrability

With an average of 3,94 within a rating scale from 1 to 5, the score for output quality measure is high (See below (Figure 14) the repartition of the answers for each of the 4 questions). The results of the last question reveal that it is difficult for some attendees to explain why the application may or not may be beneficial. The use of the application in a real context could be very useful for more accurate ratings.

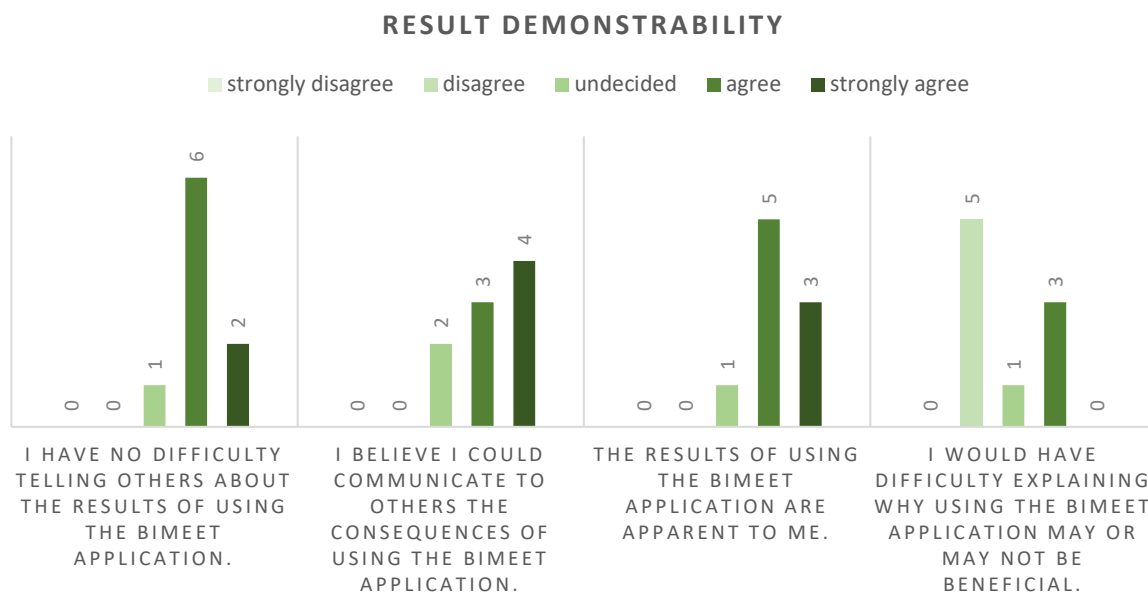


Figure 14. Result demonstrability

## 5.7 Perceived usefulness

With an average of 3,64 within a rating scale from 1 to 5, the score for perceived usefulness is relatively high (See below (Figure 15) the repartition of the answers for each of the 4 questions). The results for the two last questions reveal that the application seems useful and that it could improve the effectiveness in the attendees' jobs. Nevertheless, it is not really clear if it will increase the productivity or improve the performance. The use of the application in a real context could be very useful for more accurate ratings.

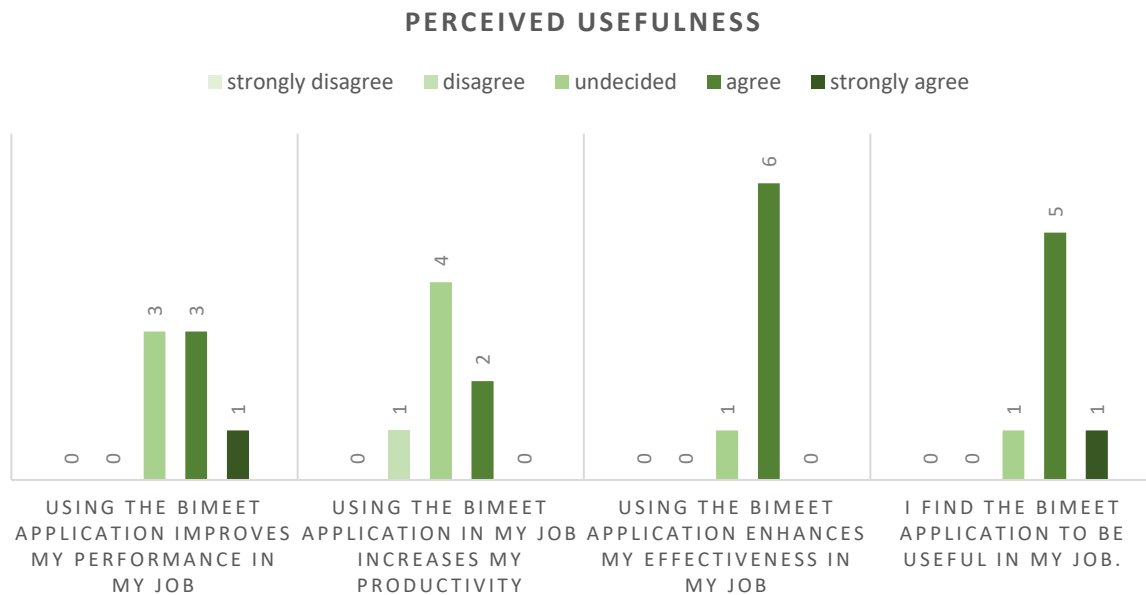


Figure 15. Perceived usefulness

## 5.8 Job relevance

With an average of 3,9 within a rating scale from 1 to 5, the score for job relevance measure is high (See below (Figure 16) the repartition of the answers for each of the 3 questions). The use of the application seems to be relevant and pertinent to support attendees job-related tasks.

### JOB RELEVANCE

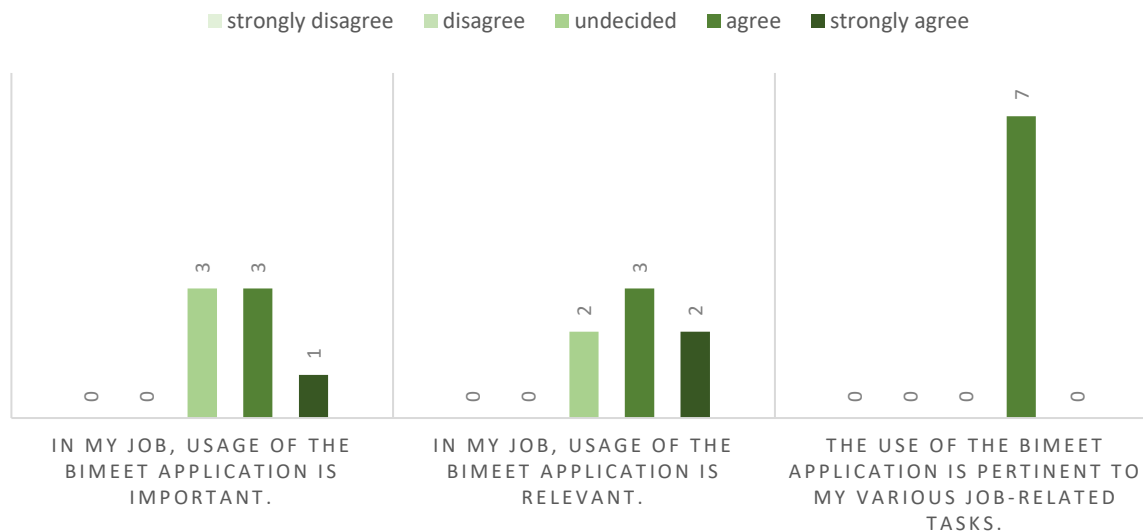


Figure 16. Job relevance

## 5.9 Behavioral intention

With an average of 3,77 within a rating scale from 1 to 5, the score for output quality measure is relatively high (See below (Figure 17) the repartition of the answers for each of the 3 questions). All the respondents would intend to use the BIMEET application assuming they had access to the BIMEET application. If we consider the real use of the application in the 6 months, only half of the respondents would use it. Some limits to use the application in a real context already exists, for example the high cost of the tangible tabletop.

### BEHAVIORAL INTENTION

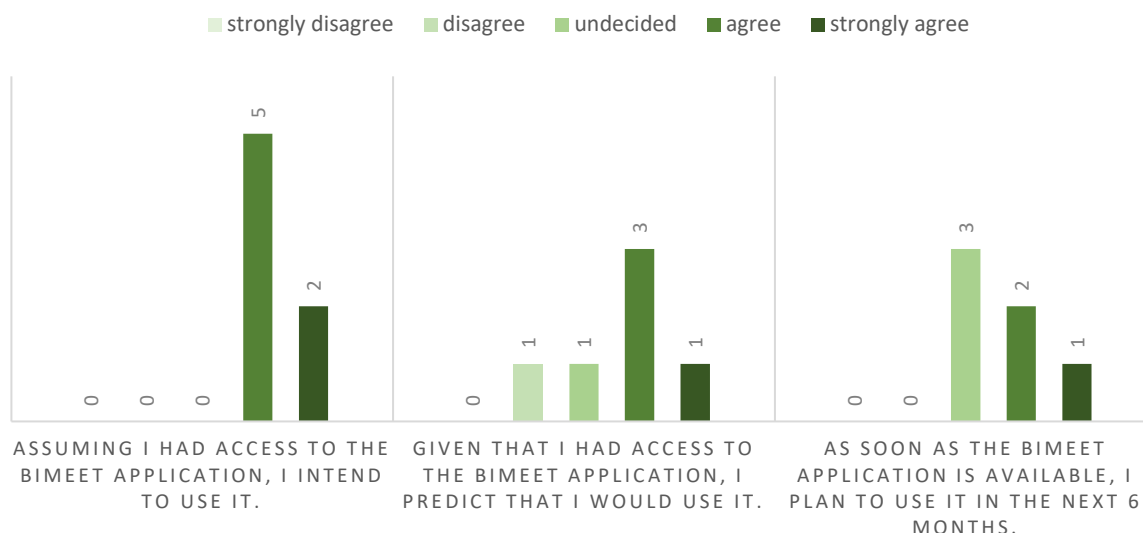


Figure 17. Behavioral intention

## 6 Conclusion

In conclusion, in order to collect feedback about the BIMEET application, in a first time, we have presented the application during a workshop, and in a second time, we have collected feedback based on a Web questionnaire inspired by the TAM3<sup>1</sup> survey. Finally, we have analysed the results. As shown in the graph below (see Figure 18), all the measures based on TAM 3 survey are quite high. The application which is still at a state of prototype is very promising. Most of the respondents really have appreciated the application. It has appeared as easy to use, very enjoyable, and well adapted to support job-related tasks. Nevertheless, we are conscious that the use of the application in a real context could be very useful for collecting more accurate ratings.

At this stage, we are considering new developments in order to extend the scope of the application such as supporting the labelling or refining the recommendation engine (see deliverable 4.2 for more details).

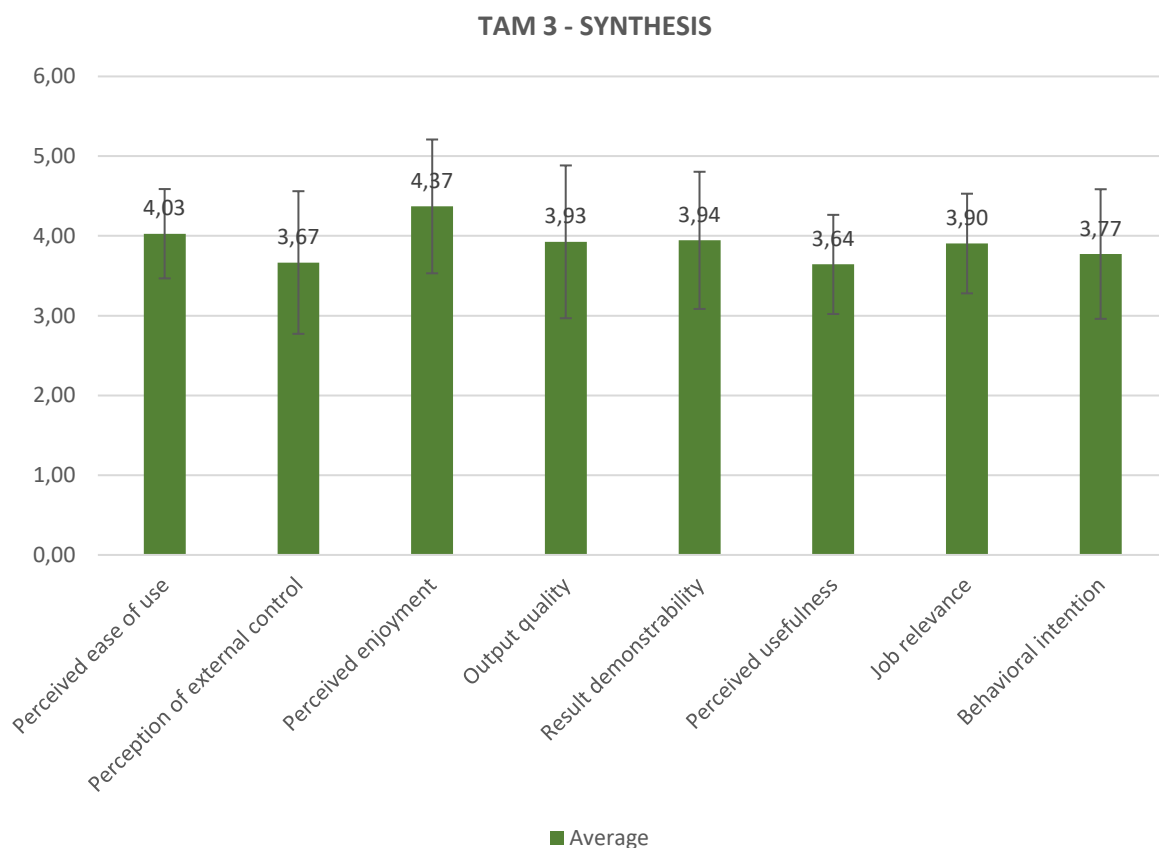


Figure 18. TAM 3 synthesis

<sup>1</sup> Technology Acceptance Model 3 from (Venkatesh & Bala, 2008)

## 7 Bibliography

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences, Volume 39 Number 2, May 2008*.

## 8 Annex

22/04/2020

Questionnaire: BIMEET application

### Questionnaire: BIMEET application

Thank you for agreeing to participate to this study. This questionnaire is used solely for research purposes as part of the project BIMEET. All data are collected anonymously and will be handled confidential.

For any question you can contact:

Annie Guerriero: [annie.guerriero@list.lu](mailto:annie.guerriero@list.lu) or Sylvain Kubicki: [sylvain.kubicki@list.lu](mailto:sylvain.kubicki@list.lu)

\* Required

1. By checking the box below, I consent to the use and processing of the data provided in this questionnaire by the researchers.

*Check all that apply.*

☐ Yes, I consent.

☐ No, I don't.

2. Age

*Mark only one oval.*

☐ <25 years

☐ 25-34 years

☐ 35-44 years

☐ 45-54 years

☐ 55+ years

☐ prefer not to say

3. Gender

*Mark only one oval.*

☐ Female

☐ Male

22/04/2020

Questionnaire: BIMEET application

4. Position

*Check all that apply.*

- ☐ Architect
- ☐ Engineer in construction
- ☐ Construction manager
- ☐ Owner
- ☐ Construction firm
- ☐ Facility manager
- ☐ BIM manager
- ☐ Researcher
- ☐ Host institution representative
- ☐ Training expert
- ☐ Tutor

Other: ☐ \_\_\_\_\_

5. Professional experience in construction

*Mark only one oval.*

- ☐ 0-2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ 10+ years
- ☐ Non applicable

6. BIM expertise

*Mark only one oval.*

- ☐ None
- ☐ Novice
- ☐ Advanced beginner
- ☐ Competent
- ☐ Proficient
- ☐ Expert

[https://docs.google.com/forms/d/12pJc4eKofYEVVvKPKcP\\_8impTx\\_\\_Kq-c\\_WpoqThMSop4/edit](https://docs.google.com/forms/d/12pJc4eKofYEVVvKPKcP_8impTx__Kq-c_WpoqThMSop4/edit)

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Questionnaire: BIMEET application

7. Energy efficiency expertise

Mark only one oval.

- ☐ None
- ☐ Novice
- ☐ Advanced beginner
- ☐ Competent
- ☐ Proficient
- ☐ Expert

8. Perceived Ease of Use \*

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
My interaction with the BIMEET application is clear and understandable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interacting with the BIMEET application does not require a lot of my mental effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the BIMEET application to be easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it easy to get the BIMEET application to do what I want it to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Questionnaire: BIMEET application

9. Perceptions of External Control \*

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
I have control over using the BIMEET application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have the resources necessary to use the BIMEET application.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Given the resources, opportunities and knowledge it takes to use the BIMEET application, it would be easy for me to use the BIMEET application.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The BIMEET application is not compatible with other applications I use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Perceived enjoyment \*

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
I find using the BIMEET application to be enjoyable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The actual process of using the BIMEET application is pleasant.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have fun using the BIMEET application.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Questionnaire: BIMEET application

11. Output quality \*

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
The quality of the output I get from the BIMEET application is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have no problem with the quality of the BIMEET application's output.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I rate the results from the BIMEET application to be excellent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Result Demonstrability \*

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
I have no difficulty telling others about the results of using the BIMEET application.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe I could communicate to others the consequences of using the BIMEET application.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The results of using the BIMEET application are apparent to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would have difficulty explaining why using the BIMEET application may or may not be beneficial.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Questionnaire: BIMEET application

13. Perceived Usefulness

To be filled in only if you are or were working in construction.

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
Using the BIMEET application improves my performance in my job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the BIMEET application in my job increases my productivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the BIMEET application enhances my effectiveness in my job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the BIMEET application to be useful in my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Job relevance

To be filled in only if you are or were working in construction.

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
In my job, usage of the BIMEET application is important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my job, usage of the BIMEET application is relevant.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of the BIMEET application is pertinent to my various job-related tasks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Questionnaire: BIMEET application

15. Behavioral Intention

To be filled in only if you are or were working in construction.

Mark only one oval per row.

	strongly disagree	disagree	undecided	agree	strongly agree
Assuming I had access to the BIMEET application, I intend to use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Given that I had access to the BIMEET application, I predict that I would use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As soon as the BIMEET application is available, I plan to use it in the next 6 months.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Thank you for your contribution. If you have any comments, feel free to use the field below.

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