DELIVERABLE: D25 - D4.5

First Seminar with Public Administration, Owners, Tenants and Building Administrators

WP Leader: University of Zagreb, Faculty of Civil Engineering
Authors: University of Zagreb, Faculty of Civil Engineering

Network for Using BIM to Increase the Energy Performance

Grant Agreement Number: 754016
Net-UBIEP H2020

April 2020

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Contents

A. Deliverable Details 3
B. Short description 4
1. Learning outcomes and training programme 5
2. Conducted courses 7
2.1 Croatia 7
2.1.1 Course description and results 7
2.1.2 Agenda 16
2.2 Estonia 16
2.2.1 Course description and results 16
2.2.2 Agenda 24
2.3 Italy 24
2.3.1 Course description and results 24
2.3.2 Agenda 28
2.4 Lithuania 30
2.4.1 Course description and results 30
2.4.2 Agenda 31
2.5 Slovakia 32
2.5.1 Course description and results 32
2.5.2 Agenda 40
2.6 Spain 40
2.1.1 Course description and results 40
2.1.2 Agenda 42
2.7 The Netherlands 42
2.7.1 Course description and results 42
2.7.2 Agenda 45

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A. Deliverable Details	
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Delivery Date:	
Author(s):	University of Zagreb, Faculty of Civil Engineering
Contributors:	All the partners
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Type of deliverable	Other
Format	Report
Dissemination Level:	Public

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B. Short description

This deliverable is informative to demonstrate the activities performed in each partner's country. It shows the partner's approach to classroom courses (training methodology) and validation results per partner country for this respective course. Statistical data shown for each partner's country could be useful to understand the need of this target. The goal of this report is to provide an overview of the **First Seminar with Public Administration, Owners, Tenants and Building Administrators**.

The main objectives that were pursued through seminars are:

1. Introduce Public Administration and Owners/Tenants/Building Administrator on the importance of having reliable information when designing and managing a building.
2. Help Public Administration and Owners/Tenants/Building Administrator to define the requirements of BIM model.
3. Develop a strategy for implementing BIM with the local stakeholders.

Validation of BIM Qualification Models and training materials was implemented in each partner country by the partners with more experience in training activities such as Universities and Training Centres. Mainly one partner per country organised and performed training, and these were as follows: ENEA (IT), FLC (ES), TUT (EE), FCE (HR), Dig.Con. (LT), ISSO (NL), ViaEU (SK).

First Seminar with Public Administration, Owners, Tenants and Building Administrators were conducted in national languages Croatian, Dutch, Estonian, Italian, Latvian, Slovak, Spanish. Validation of training material and assessment for **Public Administration, Owners, Tenants and Building Administrators** on how to use BIM for the energy performance was conducted during classroom courses using questionnaires.

Questionnaire tailored for **training participants** were prepared (*D27-D4.7 Survey and or interview among all different Targets*) in order to validate defined competence lists for **Public Administration, Owners, Tenants and Building Administrators** as well as trainee satisfaction with course and instructor (trainer) effectiveness. **Training participants** were asked to judge on their competences **before the training as well as after the training**.

Good quality practices of education are based on these three pillars:

- clear definitions of learning outcomes,
- design and structure of the programme course,
- evaluation and monitoring of the learning outcomes

Two types of questionnaires were used to cover these three pillars of good education and to simultaneously perform a self-assessment of competences gained by the participants during the course.

The purpose of the "**Pre training questionnaire**" was to assess initial level of knowledge, experience and current practices regarding BIM. "**Post training questionnaire**" contains the same or similar questions as a "Pre training questionnaire" which serve to determine in simple ways the progress training participants have made during the courses and efficiency of the courses. Questions about the completeness or redundancy of the foreseen schemes and training courses were also included in the "Post training questionnaires". The main goal of this report is to provide information for future activities, based on the experience during the Net-UBIEP project. Therefore, this report will present the overview of the conducted classroom curses and will set guidelines for the learning outcomes (also project deliverable *D4.8 Review of the three dimensional matrix*), the evaluation of the courses, and finally will also enable experience exchange between the different training institutions. The report does not contain sensitive information and the collected data is being treated confidentially following the rules of General Data Protection Regulation 2016/679.

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1. Learning outcomes and training programme

Both learning outcomes and training programme were explored and defined in details in previous project activities. All the partners followed the learning outcomes defined in deliverables *D14 - D3.1 Three-dimensional Matrix* and *D15 - D3.2 Requirement for learning outcomes* as well as the training materials developed as deliverables *D16 - D3.3 Multimedia Handbook for Public Administration on BIM* and *D17 - D3.4 Multimedia Handbook for Owners, Tenants and Building Administrators*.
Therefore, in this chapter a summary of the main information is presented, as detailed information can be found in the respective Deliverables.

The training materials developed in WP3 were in line with defined learning outcomes, while the courses and seminars were used to transfer the body of knowledge (contained in WP3 training materials) to the trainees. The main objectives of the courses and seminars were to: 1) introduce Professionals, Public administration, Owners/Tenants/Building Administrator and Technicians with the importance of having reliable information when designing and managing a building with special focus to energy efficiency; 2) Help Professionals, Public administration and Owners/Tenants/Building Administrator to define the requirements of BIM model for energy efficiency purposes; 3) Develop a strategy for implementing BIM and energy efficiency with the local stakeholders; 4) to demonstrate the activities performed in each partner's country (show the partner's approach to classroom courses - training methodology) and validate the training materials and the trainings per partner country and for the respective course.
Statistical data shown for each partner's country and the respective group trained was useful to understand the need of each target. Due to the different BIM maturity levels (different levels of maturity with regards to the ability of the construction supply chain to operate and exchange information) in different partner countries and specific competence level of the group to be trained, partners opted for the specific course durations.
The classroom courses followed somewhat different structure in every partner country but as mentioned before have always included all the learning outcomes and training content defined in respective deliverables. Partners who are highly experienced trainers and experts in both BIM and energy efficiency (working at Universities and training institutions) concluded that the same training methodology would not have the same effect in all partner countries (different maturity levels of BIM implementation as well as energy efficiency implementation). Additionally, partners assessed their target audiences for the specific training sessions and thus tailored the training duration to the specific group. Thus in countries with higher BIM maturity level and for groups like professionals who have been working with BIM previously, in depth, hands on, practical training was organized (around the same training material) with more practical explanations was organized. On the other hand, in countries with lover BIM maturity level and for group like owners who don't have any competences on BIM and energy efficiency, more theoretical training sessions were organizing, focusing on basic explanations and showing practical examples and benefits to trainees (but again tailored around the training materials developed in WP3).
Additionally, each respective partner developed their own training aids (i.e. power point presentations, etc.) which then followed their course structure.
In such a situation, partners agreed that relative validation to previous competences was the only feasible way to perform the training material validation. Absolute validation of BIM and energy efficiency competences was not possible in this circumstances because of the different starting points for training participants in partner countries and specific groups. In the opinion of the project partners, each country and group has different starting points in both BIM and energy efficiency and also specific requirements in both topics. Thus partners organized trainings which all followed the developed training materials and had just a

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slightly different training methodology. Training materials developed within the WP3 aimed to reach the defined learning outcomes.

Validation questionnaires for training participants were prepared in order to validate defined competence lists for all the different targets groups as well as trainee satisfaction with course and instructor (trainer) effectiveness. Training participants, professionals and workers belonging to the different target groups were asked to judge on their competences before the training as well as after the training. The purpose of the "Pre training questionnaire" was to assess initial level of knowledge, experience and current practices regarding BIM. "Post training questionnaire" contains the same or similar questions as a "Pre training questionnaire" which serve to determine in simple ways the progress training participants have made during the courses and efficiency of the courses. Questions about the completeness or redundancy of the foreseen schemes and training courses were also included in the "Post training questionnaires".

Partners used different systems for validation of training courses, but all using the questionnaires developed for this purpose in *D27-D4.7 Survey and or interview among all different Targets*. Some countries used GoogleForms, other partners used free web based voting solution (VoxVote) for interactive presentations and real time feedback from the course participants, BIMSync (CDE) platform was also used to evaluate training, while the fourth option was to use hardcopy questionnaires. The participants filled questionnaires anonymously during classroom courses in order to get their honest opinion and validation.

Table 1 Overview of First Seminar with Public Administration, Owners, Tenants and Building Administrators duration training methodology and number of participants

Partners country	Course date	Classroom course duration	Theoretical (T) / Practical (P)	No. of participants	Voting system
Croatia	11 December 2018	8 hours	T	42	VoxVote
Estonia	22 October 2018 15 March 2019	8 hours	T	43+52=95	Hardcopy
Italy	29 March 2019	4 hours	T	107	GoogleForms
Lithuania	10 December 2018	4 hours	T	34	BIMSync
Slovakia	25 October 2018	6 hours	T	36	GoogleForms
Spain	16 October 2018	2 hours	T	23	-
The Netherlands	31 January 2019	4 hours	T	17	-
			Total No. of participants	354	

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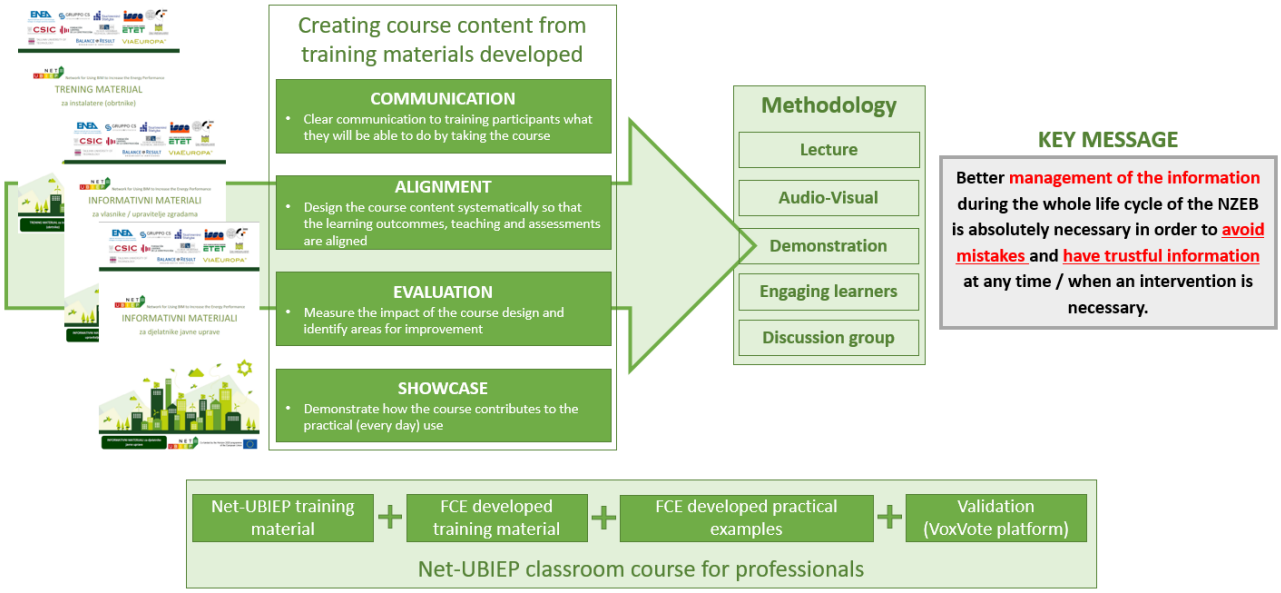
2. Conducted courses

2.1 Croatia

2.1.1 Course description and results

First Seminar with Public Administration, Owners, Tenants and Building Administrators was organized on **December 11th 2018** in Zagreb, Croatia.
The course programme consisted of 8 academic hours of theoretical lectures with application examples (case studies) but with no practical tasks.
A group of **42 participants** which work in public administration are building owners, tenants or building administrators had undertaken the classroom course in Croatia within the framework of the Net-UBIEP project.
The overview of the content development and methodological basis of the classroom courses is shown in the figure below.



Several photos from the First Seminar with Public Administration, Owners, Tenants and Building Administrators conducted by the **FCE** can be found bellow.

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Pre- and Post-training questionnaires were translated to Croatian language and filled by training participants using interactive voting system VoxVote. Pre-training questionnaire is available at this link: https://docs.google.com/forms/d/e/1FAIpQLSfQYVDL0b-Uic830VIoYTrRaET2YvaGRmp3XeiNnZgwxfe42Q/viewform

On the other hand, Post-training questionnaire is available at this link: https://docs.google.com/forms/d/e/1FAIpQLSeDbMImztef6JkfdPQRccDasa0pexMC3RPi5foZyTad-UZ6gQ/viewform

Few general conclusions of the classroom course validation from the participants in Croatia is given below, while the entire questionnaire analysis is performed in deliverable *D27-D4.7 Survey and or interview among all different Targets*. Due to the fact that validation was performed in partners' native language, the analysis below has both English questions and the same questions in native language.

1. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?	a) Yes b) No

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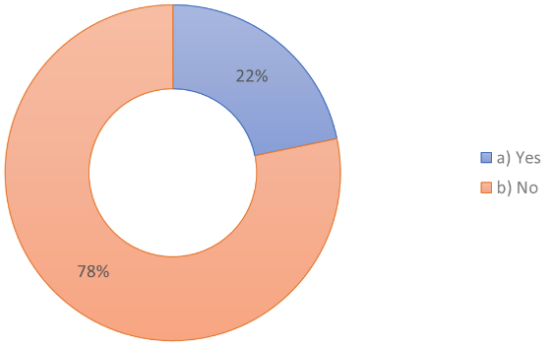
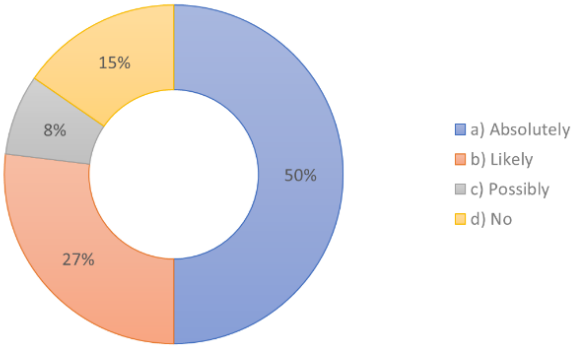
1. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?



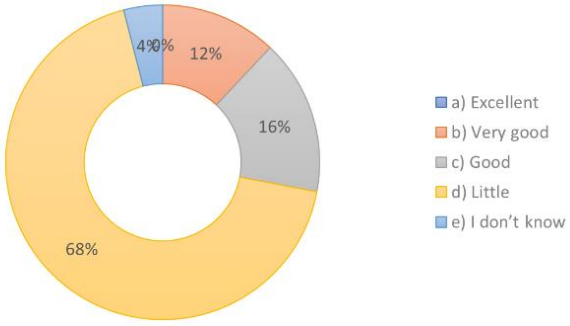
15. Would BIM certification, support or training, benefit Your colleagues?	a) Absolutely b) Likely c) Possibly d) No

15. Would BIM certification, support or training, benefit Your colleagues?



18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?	a) Excellent b) Very good c) Good d) Little e) I don't know

18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?



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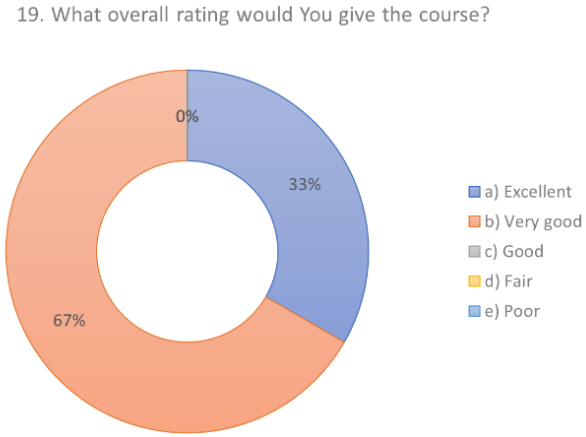
19. What overall rating would You give the course?	a) Excellent b) Very good c) Good d) Fair e) Poor



20. Please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The course objectives were clear.						
The content was organized and easy to follow.						
The course materials were clear and well written.						
The course materials contain sufficient number of images and videos explaining the course content.						
The assignments were appropriate for the level of this class.						
The topics covered were relevant to me and will be useful in my work.						
The coursework was appropriate to my prior knowledge.						
The course increased my interest in the subject.						
The course corresponded to my expectations.						

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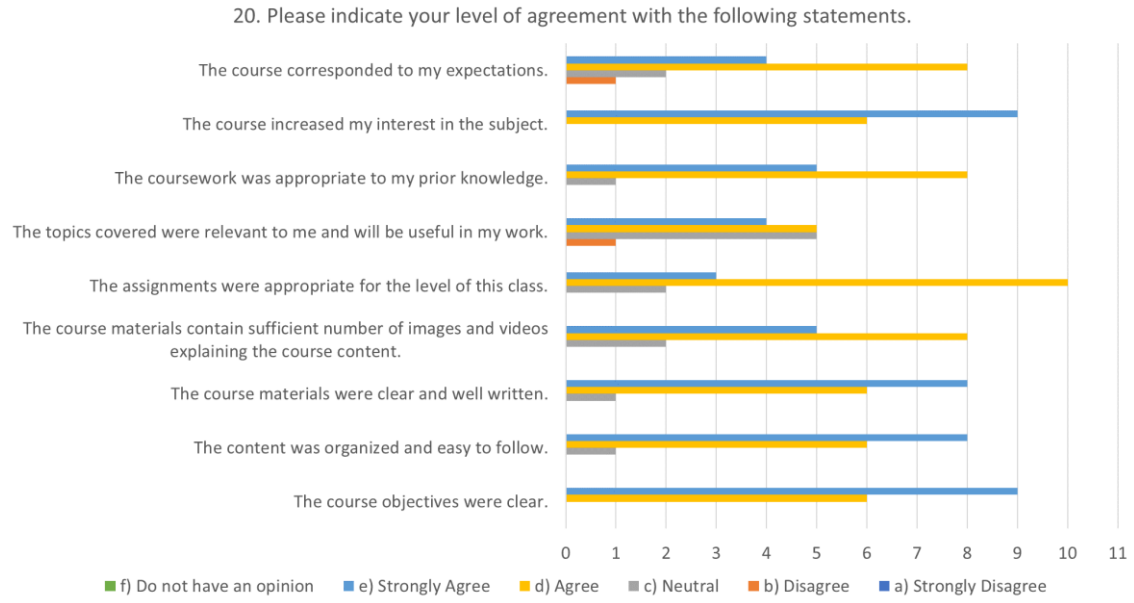
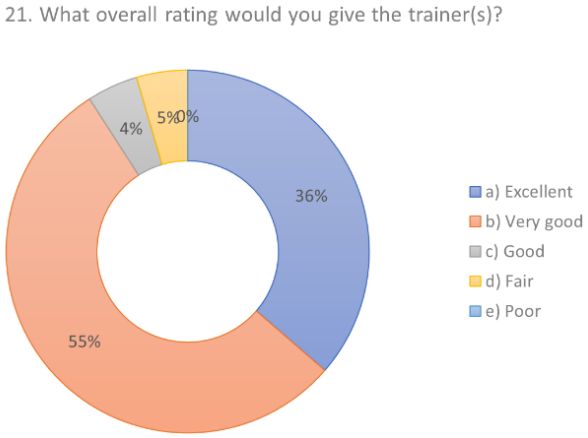


21. What overall rating would you give the trainer(s)?	a) Excellent b) Very good c) Good d) Fair e) Poor



23. How much new information did you receive in the training course? Rate on the scale from: 1 (none) to 5 (a lot of new information)	a) 1 b) 2 c) 3 d) 4 e) 5

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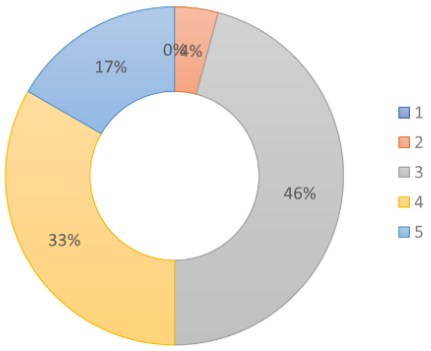
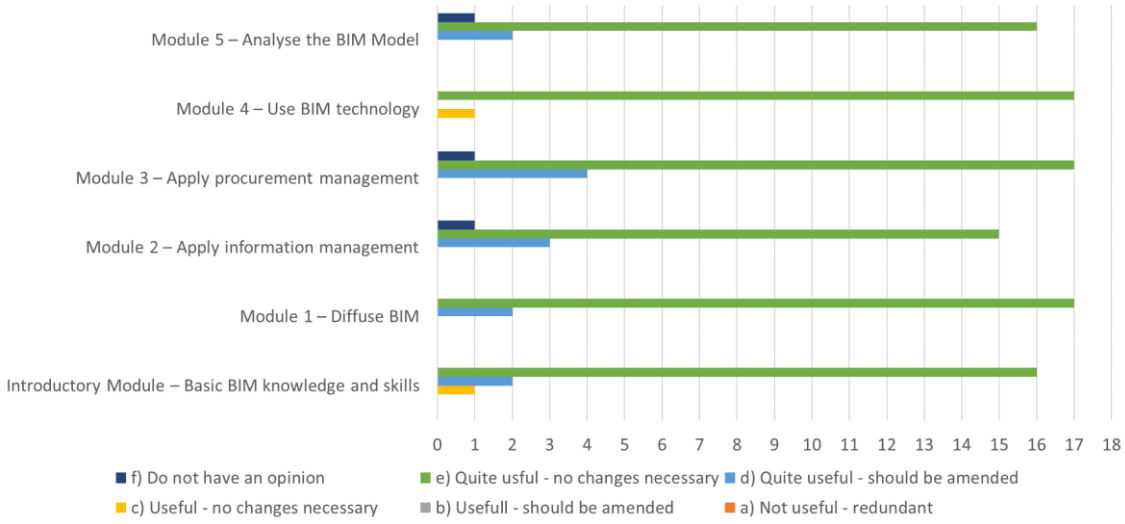
23. How much new information did you receive in the training course?



25. Please rate the following BIM course modules based on how they are useful and interesting to You.

	Not useful - redundant	Useful – should be amended	Useful – no changes necessary	Quite useful – should be amended	Quite useful – no changes necessary	Do not have opinion
Introductory Module – Basic BIM knowledge and skills						
Module 1 – Diffuse BIM						
Module 2 – Apply information management						
Module 3 – Apply procurement management						
Module 4 – Use BIM technology						
Module 5 – Analyse the BIM Model						

25. Please rate the following BIM course modules based on how they are useful and interesting to you.



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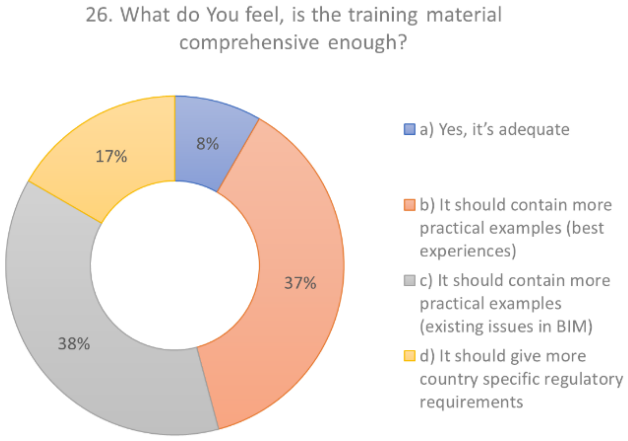
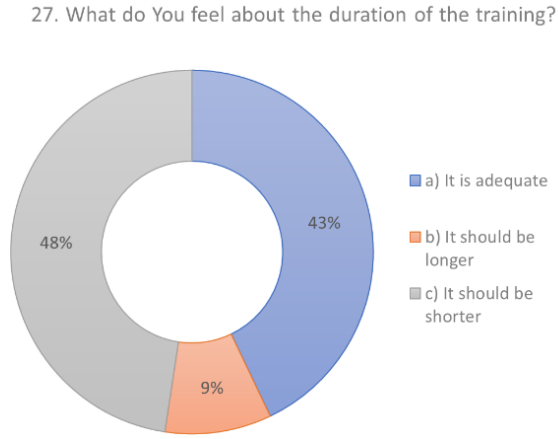
26. What do You feel, is the training material comprehensive enough? (Please mark all that apply)	a) Yes, it's adequate b) It should contain more practical examples (best experiences) c) It should contain more practical examples (existing issues in BIM) d) It should give more country specific regulatory requirements



27. What do You feel about the duration of the training?	a) It is adequate b) It should be longer c) It should be shorter



28. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Definitely b) Probably c) Not sure d) Probably not e) Definitely not

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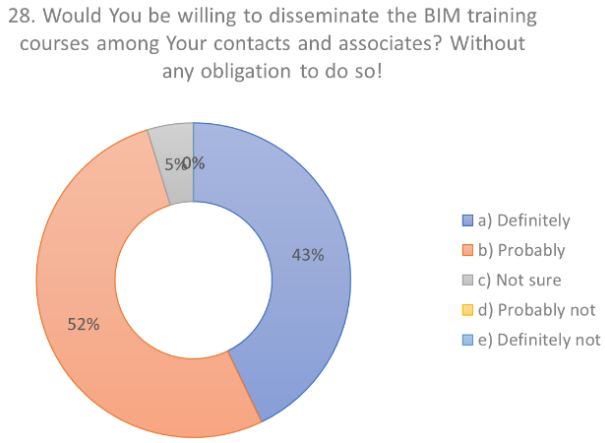
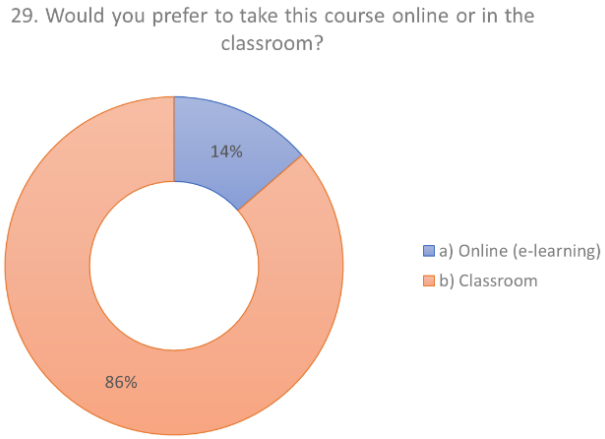


29.	Would you prefer to take this course online or in the classroom?	a) Online (e-learning) b) Classroom



It is evident from the training validation results that 77 % of participants feel BIM certification, support or training would absolutely (50 %) or likely (27 %) be beneficial to their colleagues which is a good indication of their view about the necessity of certification courses. Additionally, after the course, training participants were asked to evaluate their competences prior to the classroom course on BIM. The intention was to get the information what is their initial knowledge on BIM as well as to see whether the course was an “eye opener” and comprehensive enough. The participants replied that they feel they had little (68 %) or good (16 %) competences. Since 22 % of course participants are already using BIM (or intends to use it in near future) the overall rating of the course as very good (67 %) and excellent (33 %) is very encouraging and positive for the developed training materials and courses held in Croatia. Trainers received positive overall rating of very good (55 %) and excellent (36 %).

The majority of course participants who responded to these questions agree and strongly agree with the statements that the course objectives were clear with organized and easy to follow content. They mainly agree and strongly agree that course materials were clear and well written and contain sufficient number of images and videos explaining the course content. The positive validation of the Croatian course is also evident from the fact the majority of participants agree that assignments were appropriate for the level of this class (appropriate to their prior knowledge) and the topics covered are relevant and will be useful in their future

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work as they received new information (50 % of participants feel they got significant amount and 46 % got some amount of new information). The course also increased their interest in the subject and corresponded to their expectations.
The vast majority of respondents see the developed and presented training modules as quite useful and think that no changes are necessary, while there are several respondents that specific training modules should be amended. On the other hand, the necessity to amend the training materials is evident from the responds to question 26 where only 8 % of course participants feel the training material is adequate and comprehensive enough, while remaining participants think that training materials should contain more practical examples (best experiences and existing issues in BIM), 37 % and 38 % respectively which is a significant number and should be respected while 17 % of respondents think training materials should give more country specific regulatory requirements. Regarding the duration of training, 43 % of training participants said that 8-hour training course is adequate, while 48 % think it should be shorter. It has to be enhanced that 86 % of course participants prefer to take this course in the classroom while only 14 % of people would prefer to take it on-line.
The quality of the course is best rated if training participants disseminated and recommend the course to their colleagues, friends and associates, and in the case of Croatian 1st Seminar with Public Administration, Owners, Tenants and Building Administrators, 43 % of participants declared they would definitely and 52 % they would probably be willing to disseminate the BIM training courses among their contacts.

Analysis of the training results, problems and solutions together with lessons learned during the courses are as follows:

- A model of trainings for BIM has been developed, combining theoretical part with application examples (case studies) and without practical session using BIM tools.
- The duration of trainings – 8 hours. Participants of the trainings have confirmed that duration is appropriate but approximately the same number of participants asked for shorter training duration.

Comments and suggestions of the training participants could be summarised in the following few lines:

- The classroom course participants seek for more practical lessons and tasks, more examples of good practice.
- Lacking of digital capacity of persons would hamper the BIM implementation
- Extreme reluctance of employees to change their business as usual approach would hamper the BIM implementation
- Public bodies cannot request BIM in public procurement through because there are not enough companies which can offer these solutions

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2.1.2 Agenda

NET-UBIEP | Network for Use BIM to Increase Energy Performance

BIM za djelatnike javne uprave i vlasnike (upravitelje zgradama)

Besplatna radionica

Održavanje: 11.12.2018.

Mjesto održavanja: Građevinski fakultet, Sveučilišta u Zagrebu, Kačićeva 26, 10000 Zagreb, Vijećnica

Kontakt osoba:

- Mergim Gaši, Građevinski fakultet Zagreb,
- Tel: +385 1 4639 121
- mgasi@grad.hr

Prijavni obrazac: http://www.net-ubiep.eu/hr/registracija-2/

Sat	Tema	Predavač
9.00 – 9.30	Uvodno o projektu Net-UBIEP Zašto korištenje BIM-a može poboljšati energetsku učinkovitost u zgradarstvu	Bojan Milovanović
9.30 – 9.45	Diskusija – pre-training upitnici	Bojan Milovanović
09.45 – 10.30	Uvodni modul - osnovna BIM znanja i vještine • Uvod: što je BIM? • BIM Rječnik – osnovni pojmovi • Prednosti i cijena korištenja BIM-a u različite svrhe • Povrat na investiciju (ROI) • Standardi koji podupiru BIM proces • Diskusija	Kristijan Robert Prebanić
10.30 - 10.45	Pauza	
10.45 – 11.30	Modul 1 – Difuzija BIM-a • Otvoreni BIM alati i standardni format • BIM uloge i odgovornosti • Dimenzije BIM-a ○ 4D, 5D, 6D, 7D • Diskusija	Ivana Burcar Dunović

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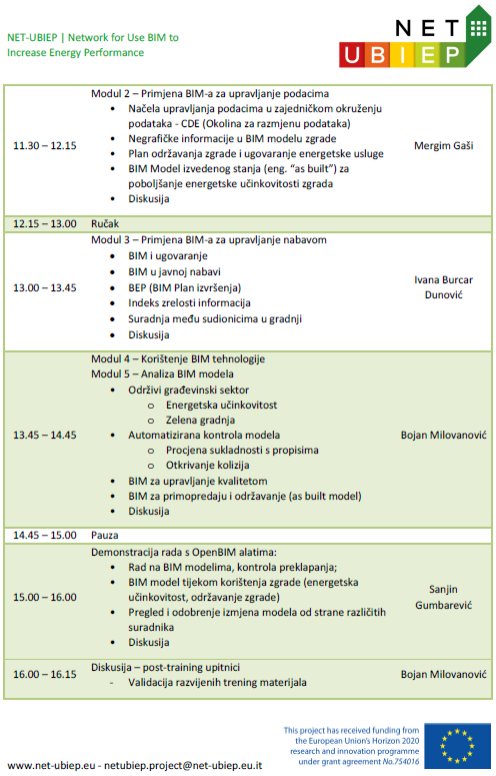

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11.30 – 12.15	Modul 2 – Primjena BIM-a za upravljanje podacima • Načela upravljanja podacima u zajedničkom okruženju podataka - CDE (Okolina za razmjenu podataka) • Negrafičke informacije u BIM modelu zgrade • Plan održavanja zgrade i ugovaranje energetske usluge • BIM Model izvedenog stanja (eng. "as built") za poboljšanje energetske učinkovitosti zgrada • Diskusija	Mergim Gaši
12.15 – 13.00	Ručak	
13.00 – 13.45	Modul 3 – Primjena BIM-a za upravljanje nabavom • BIM i ugovaranje • BIM u javnoj nabavi • BEP (BIM Plan izvršenja) • Indeks zrelosti informacija • Suradnja među sudionicima u gradnji • Diskusija	Ivana Burcar Dunović
13.45 – 14.45	Modul 4 – Korištenje BIM tehnologije Modul 5 – Analiza BIM modela • Održivi građevinski sektor ○ Energetska učinkovitost ○ Zelena gradnja • Automatizirana kontrola modela ○ Procjena sukladnosti s propisima ○ Otkrivanje kolizija • BIM za upravljanje kvalitetom • BIM za primopredaju i održavanje (as built model) • Diskusija	Bojan Milovanović
14.45 – 15.00	Pauza	
15.00 – 16.00	Demonstracija rada s OpenBIM alatima: • Rad na BIM modelima, kontrola preklapanja; • BIM model tijekom korištenja zgrade (energetska učinkovitost, održavanje zgrade) • Pregled i odobrenje izmjena modela od strane različitih suradnika • Diskusija	Sanjin Gumbarević
16.00 – 16.15	Diskusija – post-training upitnici - Validacija razvijenih trening materijala	Bojan Milovanović

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2.2 Estonia

2.2.1 Course description and results

Estonian partners decided to organise training courses specifically aiming at different target groups, thus they organised four different events where for Public Administration they intended two seminars **(Public Administration Seminar held on 22.10.2018 and Public Administration Handbooks held on 15.03.2019) with 43 and 52 participants respectively**. Two events which targeted Owners, Tenants and Building Administrators were held on **23.10.2018 (Tenants Seminar) and 5.11.2018 and 15.11.2018 (Tenants Handbooks) with 21, 13 and 40 participants respectively.**

In this report, seminars intended for Public administration will be analysed. Public Administration Seminar was organised on **October 22nd, 2018** (8 hours) while Public Administration Handbooks was held on **March 15th 2019** (8 hours) in Tallinn, Estonia.
The course programme consisted of 8 academic hours of theoretical lectures with application examples (case studies) but with no practical work.
The duration of 8 hours of the classroom course focused on the following topics:

- Introduction to energy efficiency

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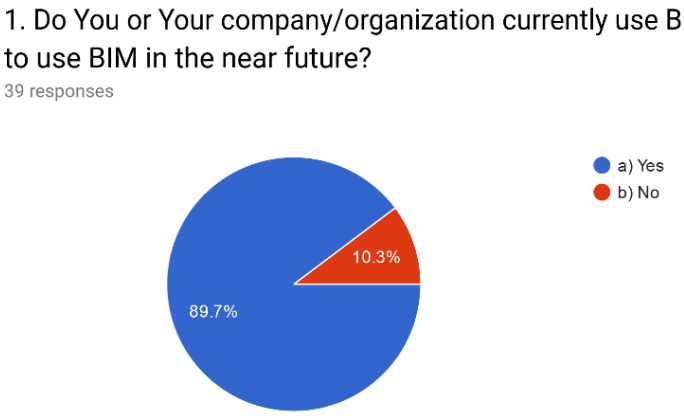
- Designed and measured energy use
- Introduction to BIM
- BIM Strategy
- BIM and energy efficiency in design and construction procurement
- Applying BIM models for building permit and permit
- How do I check the power efficiency level based on the BIM model and energy label information?

Several photos from the Public Administration Seminar conducted by the **TUT** can be found bellow.

Pre- and Post-training questionnaires were translated to Estonian language and filled by training participants. Estonian partners used hardcopy questionnaires for the course validation.

Few general conclusions of the classroom course validation from the participants in Lithuania is given below, while the entire questionnaire analysis is performed in deliverable *D27-D4.7 Survey and or interview among all different Targets*. Due to the fact that validation was performed in partners' native language, the analysis below has both English questions and the same questions in native language.

1. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?	a) Yes b) No



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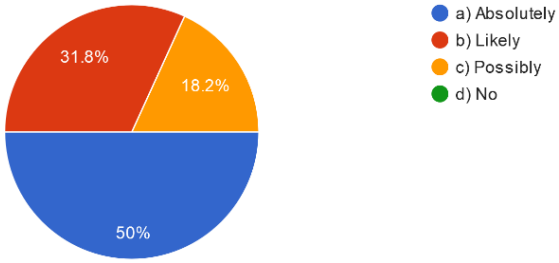
15. Would BIM certification, support or training, benefit Your colleagues?	a) Absolutely b) Likely c) Possibly d) No

15. Would BIM certification, support or training, benefit Your colleagues?

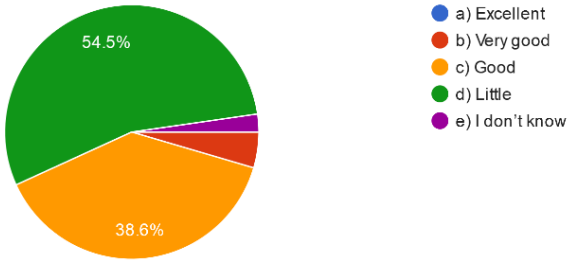
44 responses



18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?	a) Excellent b) Very good c) Good d) Little e) I don't know

18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?

44 responses



19. What overall rating would You give the course?	a) Excellent b) Very good c) Good d) Fair e) Poor

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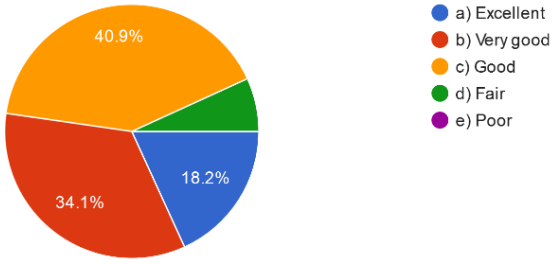
19. What overall rating would You give the course?

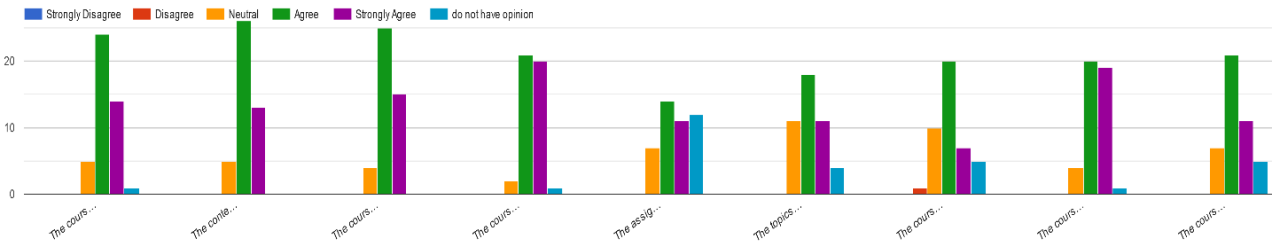
44 responses



20. Please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The course objectives were clear.						
The content was organized and easy to follow.						
The course materials were clear and well written.						
The course materials contain sufficient number of images and videos explaining the course content.						
The assignments were appropriate for the level of this class.						
The topics covered were relevant to me and will be useful in my work.						
The coursework was appropriate to my prior knowledge.						
The course increased my interest in the subject.						
The course corresponded to my expectations.						

20. Please indicate your level of agreement with the following statements:



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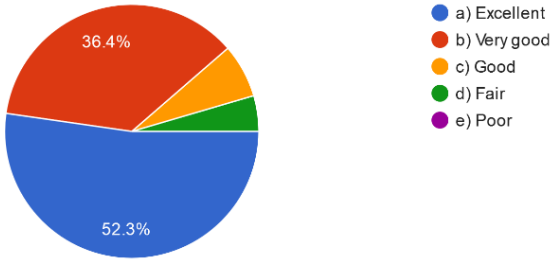
21. What overall rating would you give the trainer(s)?	a) Excellent b) Very good c) Good d) Fair e) Poor

21. What overall rating would you give the trainer(s)?

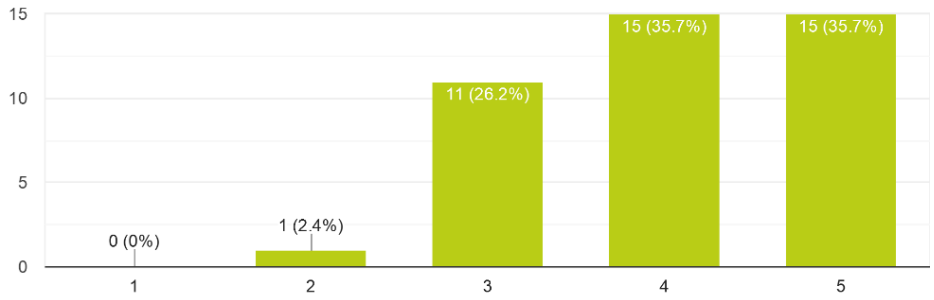
44 responses



23. How much new information did you receive in the training course? Rate on the scale from: 1 (none) to 5 (a lot of new information)	a) 1 b) 2 c) 3 d) 4 e) 5

23. How much new information did you receive in the training course?

42 responses



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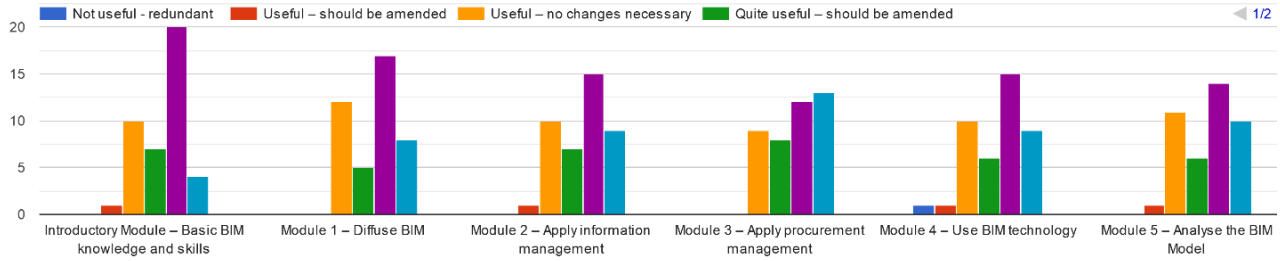
25. Please rate the following BIM course modules based on how they are useful and interesting to You.

	Not useful - redundant	Useful – should be amended	Useful – no changes necessary	Quite useful – should be amended	Quite useful – no changes necessary	Do not have opinion
Introductory Module – Basic BIM knowledge and skills						
Module 1 – Diffuse BIM						
Module 2 – Apply information management						
Module 3 – Apply procurement management						
Module 4 – Use BIM technology						
Module 5 – Analyse the BIM Model						

25. Please rate the following BIM course modules based on how they are useful and interesting to You.



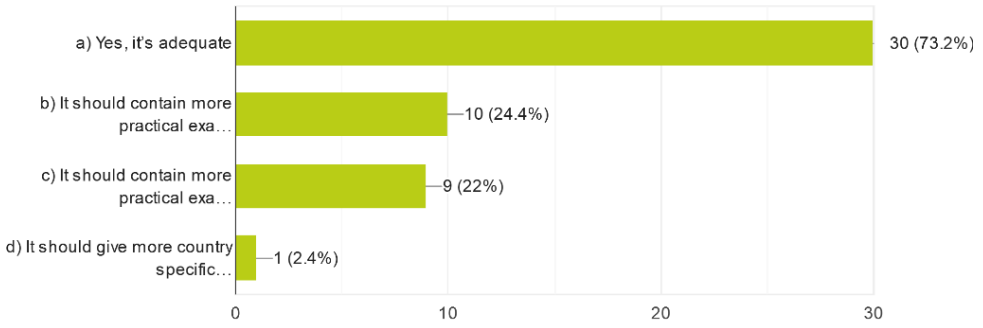
26. What do You feel, is the training material comprehensive enough?

(Please mark all that apply)

a) Yes, it's adequate
b) It should contain more practical examples (best experiences)
c) It should contain more practical examples (existing issues in BIM)
d) It should give more country specific regulatory requirements

26. What do You feel, is the training material comprehensive enough?

41 responses



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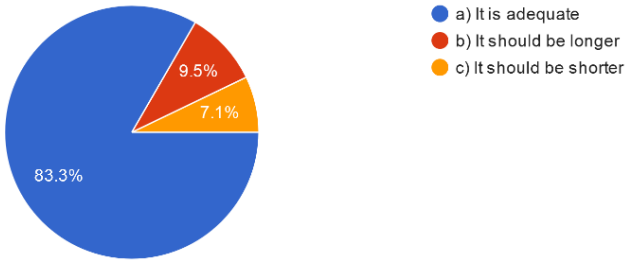
27. What do You feel about the duration of the training?	a) It is adequate b) It should be longer c) It should be shorter

27. What do You feel about the duration of the training?

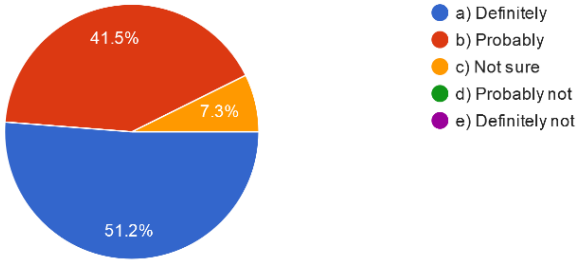
42 responses



28. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Definitely b) Probably c) Not sure d) Probably not e) Definitely not

28. Would You be willing to disseminate the BIM training courses among Your contacts and associates?

41 responses



29. Would you prefer to take this course online or in the classroom?	a) Online (e-learning) b) Classroom

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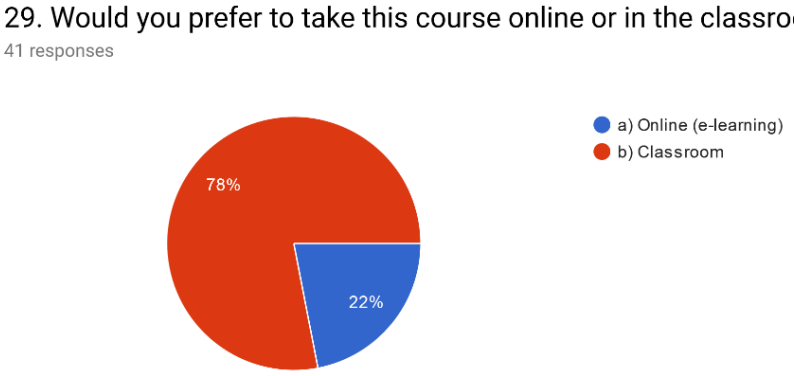

It is evident from the training validation results that 81.8 % of participants feel BIM certification, support or training would absolutely (50 %) or likely (31.8 %) be beneficial to their colleagues which is a good indication of their view about the necessity of certification courses. Additionally, after the course, training participants were asked to evaluate their competences prior to the classroom course on BIM. The intention was to get the information what is their initial knowledge on BIM as well as to see whether the course was an "eye opener" and comprehensive enough. The participants replied that they feel they had little (54.5 %) or good (38.6 %) competences. Since 89.7 % of course participants are already using BIM (or intends to use it in near future) the overall rating of the course as good (40.9 %), very good (34.1 %) and excellent (18.2 %) is very encouraging and positive for the developed training materials and courses held in Estonia. Trainers received positive overall rating of very good (36.4 %) and excellent (52.3 %).

The majority of course participants agree to the statements that the course objectives were clear with organized and easy to follow content. They mainly agree and strongly agree that course materials were clear and well written and contain sufficient number of images and videos explaining the course content. The positive validation of the Estonian course is also evident from the fact the majority of participants agree that assignments were appropriate for the level of this class (appropriate to their prior knowledge) and the topics covered are relevant and will be useful in their future work as they received new information (71.4% of participants feel they got a significant amount of new information). The course also increased their interest in the subject and corresponded to their expectations.

When getting more in depth and looking for their opinion on each of the training modules, participants have opinion that Introductory module and 5 modules developed are deemed useful or quite useful and require no changes, but there is significant number of those that do not have an opinion. Specifically, the general opinion is that training materials are adequate, while some participants would like to have more practical examples (best experiences and existing issues in BIM), 24.4 % and 22.0 % respectively. Regarding the duration of training, 83.3 % of training participants said that 8-hour training course is adequate, while 9.5 % think it should be longer and 7.1 % think the course should be shorter. It has to be enhanced that 78.0 % of course participants prefer to take this course in the classroom while only 22.0 % of people would prefer to take it on-line.

The quality of the course is best rated if training participants disseminated and recommend the course to their colleagues, friends and associates, and in the case of Estonian Seminar for Public Authority, participants declared they would definitely (51.2 %) and probably (41.5 %) be willing to disseminate the BIM training courses among their contacts.

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2.2.2 Agenda

The agenda was the same for both courses, Public Administration Seminar held on 22.10.2018 and Public Administration Handbooks held on 15.03.2019 as shown below.

Ensuring the energy performance of buildings by using BIM- training for local governments, subscribers and owners, property custodians and managers

Date: 22. 10 2018, 10:00 - 17:30

Location: Tallinn University of Technology, Ehitajate tee 5, U05 409

Time schedule

Time	Lecturer	Title
10:00-10:45	Targo Kalamees	**Introduction to energy performance of buildings** • H / A, ETA, KEK • What does the future hold? • Energy efficiency assessment at the stage of applying for a building permit and a permit for use • Energy efficiency planning in building design • Impact of construction design and construction quality on energy efficiency
10:45-11:30	Anti Hamburg	**Designed and measured energy consumption** • How to read the label? • New buildings • Renovation of buildings
11:30-11:45		**Pause**
11:45-13:15	Raido Puust	**Introduction to BIM** • Terms, principles, process description • BIM versus CAD • Different stages and details of the models • BIM versus traditional design
13:15-14:15		**Lunch**
14:15-15:45	Ergo Pikas	**BIM Strategy:** • Objectives and uses of the BIM design, • Implementation of BIM in the design and organization, • Principles of open BIM interoperability, • BIM standards and guidelines • BIM requirements and practice at different stages: o Pre-design activities (eg architectural competitions, initial sketches, description of needs, concept development, etc.) o Design, Construction, Supervision o Use, o Demolition o Examples of best / worst theory and best / worst practice
	Ergo Pikas Targo Kalamees	**BIM and energy performance in design and construction procurement** • Requirements for procurement modeling, final result • Requirements for competent persons (invitations) • Model inspection and delivery
15:45 – 16:00		**Pause**
16:00-16:45	Raido Puust	**Application of BIM models in issuing building permits and permits for use:** • Software, file formats, transfer of information from one BIM to another • Working with models, • Navigating models, • Reading model construction information and deriving new construction information from the model (areas, • Window area, area of fencing structures • Properties of building parts: thermal permeability, thicknesses of material layers, material properties
16:45-17:30	Anti Hamburg	**How to check the order of magnitude of energy performance based on BIM model and energy label information?** • Heat losses ~ ratio of heating energy consumption • Thermal permeability (thermally homogeneous, thermally homogeneous) • Renewable energy production (slope, orientation, shadows) • Transfer of information from BIM to energy efficiency software
17:30-17:40		**Test**

2.3 Italy

2.3.1 Course description and results

First Seminar with Public Administration, Owners, Tenants and Building Administrators was organized on **March 29th 2019** in Oristano, Italy.
The course programme consisted of 4 hours of theoretical lectures with application examples (case studies) but with no practical tasks.
A group of **107 participants** which work in public administration are building owners, tenants or building administrators had undertaken the classroom course in Italy within the framework of the Net-UBIEP project.
The overview of lectures held at the First Seminar with Public Administration, Owners, Tenants and Building Administrators course is shown below.

- The challenges of the cities and the role of the municipalities for an energy transition that affects all sectors and thanks to the BIM tools it can also implement the management and monitoring of the

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SECAP "Sustainable Energy Climate Action Plan". BIM as a development of real estate management;

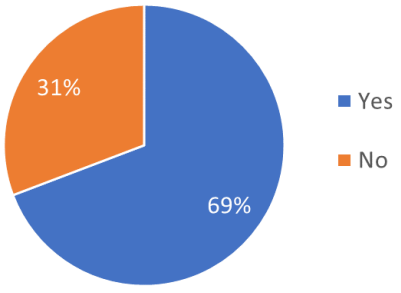
- Building information modelling as a tool for the sustainability of our cities.
- The Data Sharing Environment (ACDat) for managing the information flow of the BIM process
- Application of BIM in energy performance and property management contracts to reduce consumption and produce energy from renewable sources integrated in the building.
- Good practices of using BIM in respective regions

Several photos from the First Seminar with Public Administration, Owners, Tenants and Building Administrators conducted by **ENEA** can be found bellow.

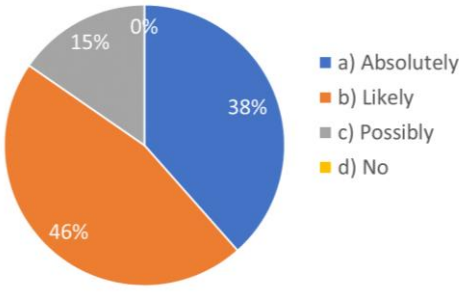
Pre- and Post-training questionnaires were translated to Italian language and filled by training participants, using the google form app created in order to facilitate the filling.

Few general conclusions of the classroom course validation from the participants in Italy is given below, while the entire questionnaire analysis is performed in deliverable *D27-D4.7 Survey and or interview among all different Targets*. Due to the fact that validation was performed in partners' native language, the analysis below has both English questions and the same questions in native language.

1. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?



15. Would BIM certification, support or training, benefit Your colleagues?



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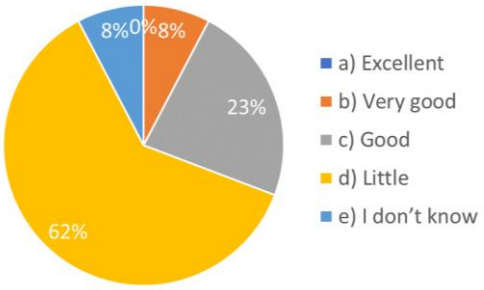
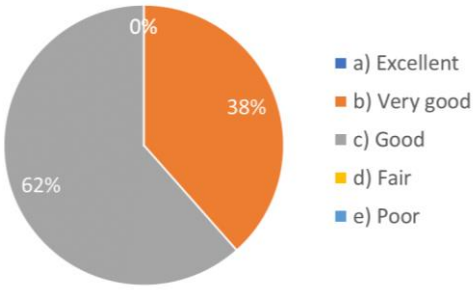
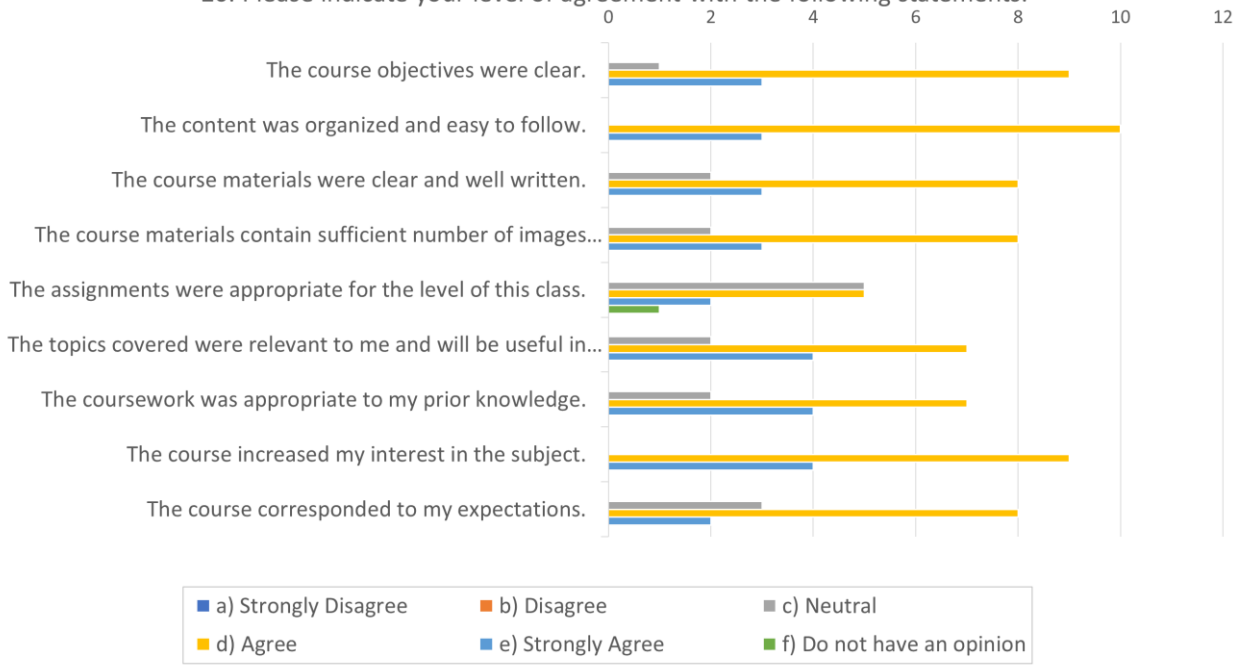
18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?



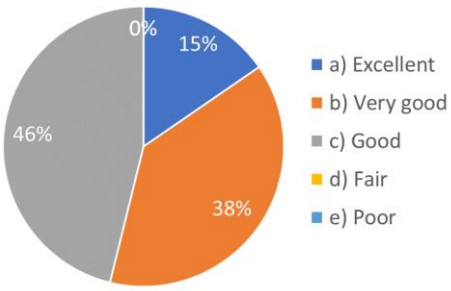
19. What overall rating would You give the course?



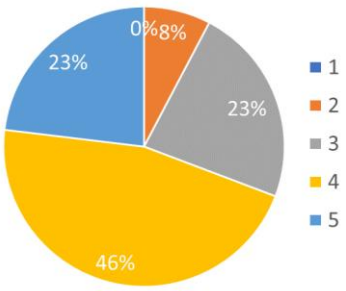
20. Please indicate your level of agreement with the following statements.



21. What overall rating would you give the trainer(s)?



23. How much new information did you receive in the training course?



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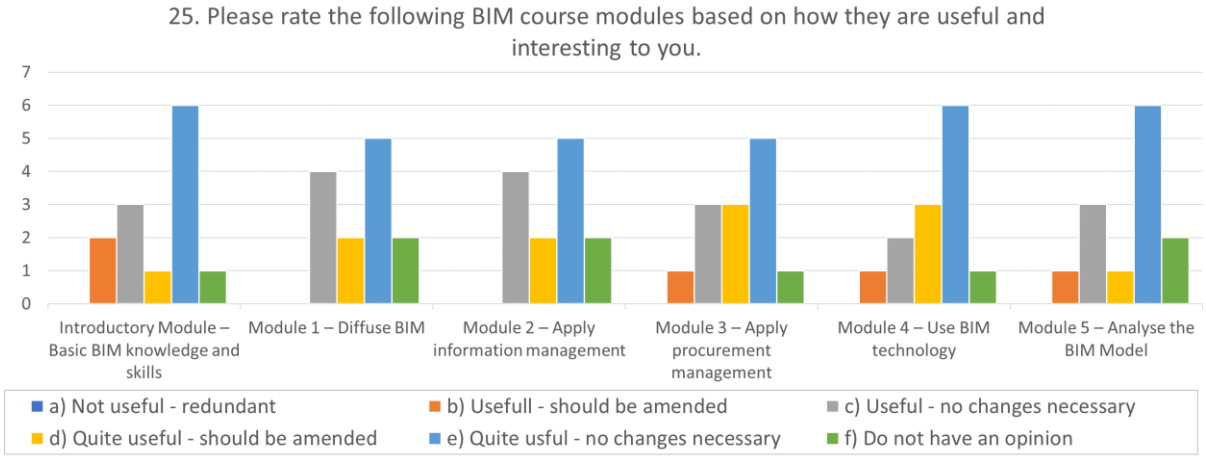

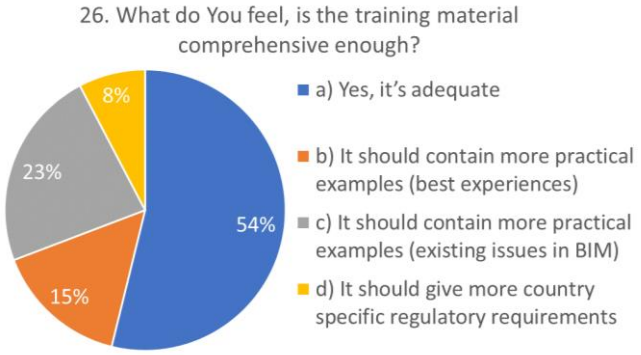

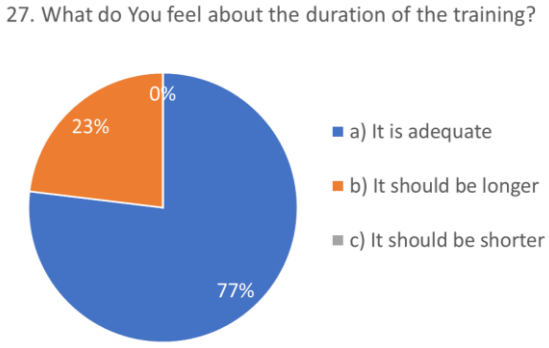

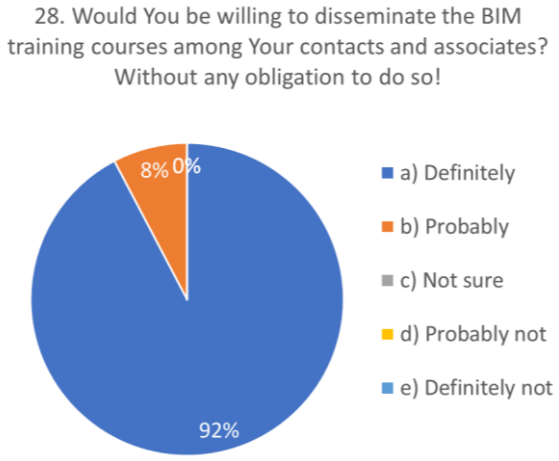

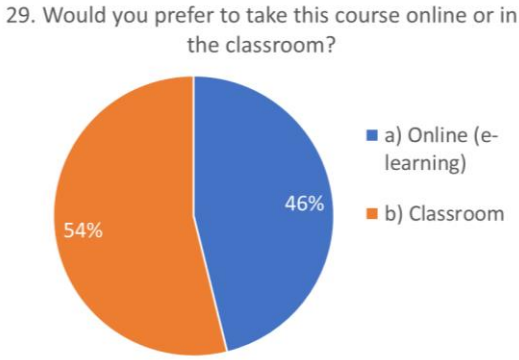

It is evident from the training validation results that 84 % of participants feel BIM certification, support or training would absolutely (38 %) or likely (46 %) be beneficial to their colleagues which is a good indication of their view about the necessity of certification courses. Additionally, after the course, training participants were asked to evaluate their competences prior to the classroom course on BIM. The intention was to get the information what is their initial knowledge on BIM as well as to see whether the course was an "eye opener" and comprehensive enough. The participants replied that they feel they had little (62 %) or good (23

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%) and very good (8 %) competences. Since 69 % of course participants are already using BIM (or intends to use it in near future) the overall rating of the course as good (62 %), very good (38 %) is very encouraging and positive for the developed training materials and courses held in Italy. Trainers received overall rating of good (46 %), very good (38 %) and excellent (15 %) which, it has to be said should be improved in future, since on other comparable courses, more participants deemed the trainers as very good or excellent.
The majority of course participants agree to the statements that the course objectives were clear with organized and easy to follow content. They mainly agree that course materials were clear and well written and contain sufficient number of images and videos explaining the course content. There were no practical assignments so there is a significant number of participants who are neutral with the claim that assignments were appropriate for the level of this class while the coursework was appropriate to their prior knowledge and the topics covered were relevant and will be useful in their future work as they received new information (69 % of participants feel they got significant amount of new information). The course also increased their interest in the subject and corresponded to their expectations.
When getting more in depth and looking for their opinion on each of the training modules, participants feel that Introductory module and modules 1 - 5 are useful and requires no changes. Specifically, the general opinion is that training materials are adequate, but some participants (38 %) said it should contain more practical examples (best experiences and existing issues in BIM). Regarding the length of training, 77 % of training participants said that 4-hour training course is adequate, while 23 % think it should be shorter. It has to be enhanced that 54 % of course participants prefer to take this course in the classroom while 46 % of people would prefer to take it on-line which is the highest ratio of people in all countries and all training courses.
The quality of the course is best rated if training participants disseminated and recommend the course to their colleagues, friends and associates, and in the case of Italian Second Seminars with Public Administration, Owners, Tenants and Building Administrators, participants declared they would definitely (92 %) and probably (8 %) be willing to disseminate the BIM training courses among their contacts.

Comments and suggestions of the training participants could be summarised in the following few lines:

- Some participants declared they would like to have application practice section and the use of software
- Some participants declared they would like to have more practical case studies, major best practices, examples of procurement using the BIM
- Training participants were asking for a possibility to access the slides and the material used during the seminar which is an indication that better communication of e-learning system and Net-UBIEP training materials is needed

2.3.2 Agenda

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Il seminario ha l'obiettivo di presentare la metodologia BIM fornendo ai partecipanti una conoscenza di base del Building Information Modelling.
A seguito del nuovo DM 560/17 (Decreto BIM) e della pubblicazione delle norme UNI 11337 (2017) risulta importante conoscere il BIM e la sua applicazione e diffusione a livello nazionale ed internazionale.
Verrà presentato il progetto NET-UBIEP che ha l'obiettivo di aumentare le prestazioni energetiche degli edifici stimolando e promuovendo l'uso del BIM durante il ciclo di vita di un edificio: dalla fase di progettazione alla costruzione, gestione, manutenzione, ristrutturazione, per arrivare, infine, alla demolizione.
Per raggiungere gli obiettivi di net-UBIEP occorre che tutti i tecnici della filiera delle costruzioni siano pronti a migliorare le proprie competenze attraverso l'utilizzo del BIM (Building Information Modelling) integrato con l'introduzione dei criteri di performance energetica degli edifici per una migliore qualità del progetto e per un costo inferiore.
L'uso del BIM si sta diffondendo sempre più in tutti i paesi del mondo, chi non si adatterà in fretta al nuovo mondo digitale rischia di vedersi sostituito da professionisti di altri paesi dal momento che un progetto digitale può essere realizzato e condiviso via internet.
NET-UBIEP promuove anche la collaborazione in tutta la filiera perché è importante che tutti i professionisti e i tecnici, che partecipano alle diverse fasi della progettazione e della realizzazione, abbiano uno specifico ruolo di raccolta, gestione e memorizzazione di tutte le informazioni necessarie, durante l'intero il ciclo di vita dell'edificio. Ogni tecnico, dipendente pubblico, progettista, costruttore, gestore di strutture o fornitore, deve dunque conoscere quali informazioni possano essere utilizzate potenzialmente da qualsiasi altro attore. Non solo, tutte le informazioni dovranno essere disponibili per tutta la vita dell'edificio anche quando il processo che l'ha generato è terminato. È quindi essenziale che tutti i diversi attori utilizzino lo stesso linguaggio, gli stessi dizionari e la stessa struttura dei dati.
La partecipazione consente il riconoscimento dei crediti formativi professionali – CFP, ai sensi dell'art.7 del D.P.R. 137/2012 e dell'art.3 del Regolamento per l'aggiornamento e lo sviluppo professionale continuo.

A cura di:

ENEA
Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

città di Oristano

Con la collaborazione di

Regione Autònoma de Sardigna
Regione Autonoma della Sardegna

uniss
Università degli Studi di Sassari

architetti Oristano

Ordine degli Ingegneri della Provincia di Oristano

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Segreteria Organizzativa
Comune di Oristano – Settore Sviluppo del territorio e Lavori Pubblici - Settore Programmazione, gestione delle risorse.
e-mail: europaincomune@comune.oristano.it

Con il supporto organizzativo di
Confartigianato Imprese Sardegna

Confartigianato Imprese Sardegna

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

NET UBIEP
Network for Using BIM
to Increase the Energy Performance

www.net-ubiep.eu

Building Information Modeling: Innovazione e nuove frontiere per infrastrutture e città sostenibili - progetto NET UBIEP

29/03/2019
Oristano - sala conferenze Hospitali
Sancti Antoni – via Cagliari, 161
Ore 15.00-18.30

L'ENEA, in collaborazione con il Comune di Oristano propone un seminario tecnico sul tema: **Building Information Modeling: Innovazione e nuove frontiere per infrastrutture e città sostenibili.**

Programma

Ore 15:00 inizio lavori

Saluti istituzionali
Andrea Lutzu
Sindaco del Comune di Oristano

Introduzione al Workshop
Giovanni Addamo – ENEA - Dipartimento E.E. – Laboratorio SIST-CENTRO

Ore 15.40
L'Ambiente della Condivisione dei Dati (ACDat) per la gestione del flusso informativo del processo BIM
Il clima collaborativo, alla base del BIM, deve avere un Ambiente di Condivisione dei Dati per favorire il dialogo tra tutti gli attori senza perdita d'informazioni ma anche senza ridondanze e evitando incomprensioni
Giuseppe Esposito, ACCA

Ore 16.20
Applicazione del BIM nei contratti di rendimento energetico e gestione degli immobili per ridurre i consumi e produrre energia da fonti rinnovabili integrate nell'edificio.
La modellazione BIM permette di avere uno strumento utile per valutare l'opportunità di una riqualificazione più o meno profonda di un edificio riuscendo a calcolare i tempi di ritorno con certezza dei risultati utilizzando gli incentivi fiscali oggi disponibili: Eco bonus e Sisma bonus.
Enrico Zoccatelli Global Power Service, Esco

Ore 16.50
Progettare gli impianti per il miglioramento della performance energetica utilizzando il BIM: Un'applicazione alla scuola delle energie dell'ENEA.
Per progettare e riqualificare un edificio esistente, il BIM può essere utilizzato per visualizzare i diversi interventi e scegliere quello ottimale. Il BIM, in questo caso, non solo permette di simulare le diverse soluzioni calcolando i tempi di ritorno dell'investimento, ma serve anche come strumento di comunicazione con i clienti finali essendo la visualizzazione dei modelli BIM molto più "friendly" di qualsiasi relazione tecnica.

Il building information building come strumento per la sostenibilità delle nostre città.
Il BIM non è più uno strumento per la sola progettazione di edifici, ma è anche uno strumento per progettare, realizzare, gestire a manutenere meglio edifici e infrastrutture di superficie e del sottosuolo. In tale contesto l'uso dell'openBIM diventa essenziale per assicurare la gestione delle informazioni in qualsiasi ambito settoriale, geografico e temporale.
Anna Moreno, Enea

Ore 17.30
Esperienze della ricerca in Sardegna sull'applicazione del BIM – Università di Cagliari e Sassari.

Antonello Sanna – Emanuela Quaquero
Dipartimento di Ingegneria civile, ambientale e Architettura - Università di Cagliari

Antonello Monsù Scolaro
Dipartimento di Architettura – Università di Sassari

Ore 18.15
Buone pratiche della PA sul BIM in Sardegna

Marco Naseddu - Regione Autonoma della Sardegna - CRP

Ore 18:30
Somministrazione questionario finale da compilare on line http://www.net-ubiep.eu/it/assessments-5

Dibattito Finale

Iscrizioni

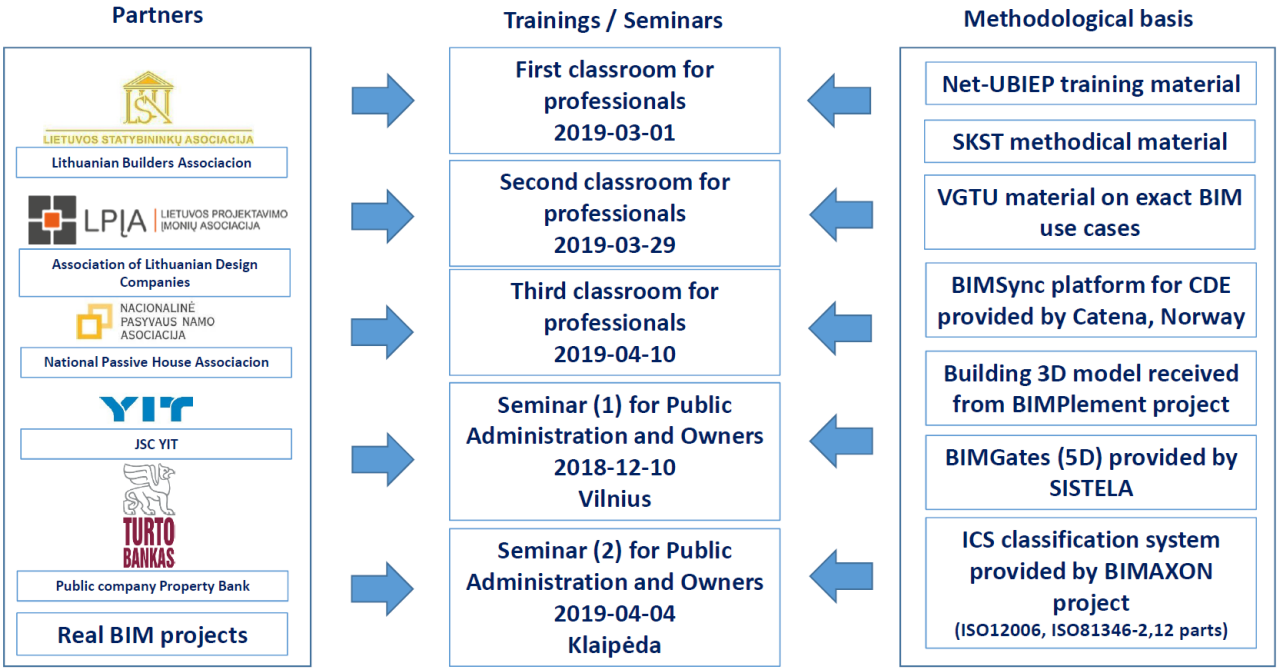
https://www.facebook.com/events/2194439547310822/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

2.4 Lithuania

2.4.1 Course description and results

First Seminar with Public Administration, Owners, Tenants and Building Administrators was organized on **December 10th 2018** in Vilnius, Lithuania.
The course programme consisted of 4 academic hours combining theoretical part with application examples (case studies) but without practical tasks.
A group of **34 participants** which work in public administration are building owners, tenants or building administrators had undertaken the classroom course in Lithuania within the framework of the Net-UBIEP project.
The overview of the partners and methodological basis of the classroom courses is shown in the figure below.



Prepared by: Doc. Dr. Vaidotas Šarka (VšĮ „Skaitmeninė statyba“); Doc. Dr. Tatjana Vilutienė (Vilnius Gediminas Technical University)

Several photos from the First Seminar with Public Administration, Owners, Tenants and Building Administrators conducted by **Dig.Con.** can be found bellow.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Pre- and Post-training questionnaires were translated to Lithuanian language but only pre-training questionnaire was filled by training participants. For the reason of lacking post-training questionnaire results validation of this specific classroom course cannot be competed.

Analysis of the training results, problems and solutions together with lessons learned during the courses are as follows:

- The duration of seminars – 4 hours. Participants of the seminars have confirmed that duration is appropriate.
- 8 lecturers made presentations at the seminars.
- Theory was combined with application examples (case studies): 50 % – theory, 50 % – real cases.
- It was the problem to fill the questionnaires during the short time of seminar. It was quite difficult to attract the participants to "future" construction related topics. Seminars were attended by representatives of more than 40 organizations (including municipalities).
- In seminars participated about 30 percent less than registered. To attract the required number of participants it is necessary to register about 30% more potential participants.

2.4.2 Agenda

Skaitmeninė Statyba | VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS | NET UBIEP | Co-funded by the Intelligent Energy Europe Program of the European Union

Seminaras „Kaip efektyviai projektuoti ir statyti bei naudoti energijos beveik nenaudojančius (*angl. NZEB*) tvarius pastatus, taikant statinių informacinio modeliavimo (BIM) metodiką"

Seminar "How to efficiently design, build and use energy-efficient (NZEB) sustainable buildings using building information modeling (BIM) methodology"

Net-UBIEP 1-asis seminaras viešojo administravimo subjektams(WP4) / Net-UBIEP 1st Seminar for Public Administration

Data/ Date: 2018-12-11

Vieta / Place: Vilniaus miesto savivaldybės (Vilnius City Municipality) 1 a. salė (Konstitucijos pr. 3, Vilnius)

SEMINARO PROGRAMA / PROGRAM OF THE SEMINAR		
Laikas / Time	**Tema / Topic**	**Pranešėjas / Presenter**
8:30-9:00	Registracija / Registration	
9:00-9:10	Sveikinimo žodis, seminaro tikslai / Welcome word, goals of seminar	Dalius Gedvilas (VšĮ „Skaitmeninė statyba")
9:10-9:30	Kas yra BIM ir kodėl BIM? Vertė tvarumo ir energinio efektyvumo užtikrinimui. Jūsų vaidmuo BIM projektuose / What is BIM and why BIM? Value for sustainability and energy efficiency. Your role in BIM projects.	Edita Šarkienė (Vilniaus Gedimino technikos universitetas)
9:30-9:50	BIM projekto planavimas ir valdymas energinio efektyvumo didinimui. Kas yra EIR ir BEP? Kodėl svarbu parengti racionalų EIR? / BIM project planning and management to increase energy efficiency. What are EIR and BEP? Why is it important to develop a rational EIR?	Vaidotas Šarka (VšĮ „Skaitmeninė statyba")
9:50-10:10	BIM įrankiai ir formatai. *Open BIM*. Duomenų mainų ir bendradarbiavimo aplinka (CDE) / BIM tools and formats. Open BIM. Data Exchange and Collaboration Environment (CDE)	Dainius Gudavičius (Projektavimo įmonių asociacija)
10:10-10:30	BIM taikymo efektyvumo matavimai statinio gyvavimo cikle / BIM application efficiency in the building life cycle	Tatjana Vilutienė (Vilniaus Gedimino technikos universitetas)
10:30-10.50	Klausimai / Diskusija / Questions / Discussion	
10:50-11.10	Kavos pertraukėlė / Komunikavimas / *Coffee Break / Communication*	
11:10-11:30	Naujos Architektūros galimybės taikant BIM energinio efektyvumo bei tvarumo kontekste / New architectural possibilities in applying BIM in the context of energy efficiency and sustainability	Marius Žygaitis (Architektų sąjunga)
11:30-11:50	Kaip esame pasirengę energijos beveik nenaudojančių pastatų statybai (NZEB) projektavimui ir statybai? Kokie racionalūs NZEB parametrai? / How are we prepared to design and build low energy buildings (NZEB)? What are the rational parameters of NZEB?	Prof. Vytautas Martinaitis (Vilniaus Gedimino technikos universitetas)
11:50-12:10	Energinis efektyvumas ir BIM. Iššūkiai ir galimybės. Praktika / Energy efficiency and BIM. Challenges and opportunities. Practical experience	Remigijus Simanavičius (Pasyvių namų asociacija)
12:10-12:30	BIM - naujos energinio efektyvumo didinimo galimybės. Praktika / BIM - new opportunities to increase energy efficiency. Practice	Audrius Leonavičius (UAB YIT Lietuva)
12:30-13:00	Klausimai / Diskusija / Questions / Discussion	
13:00	Renginio pabaiga / Event Closure	

Net-UBIEP: D4.5-D25LT First Seminar with Public Administration and Owners, Tenants and Building Administrators

Skaitmeninė Statyba | VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS | NET UBIEP | Co-funded by the Intelligent Energy Europe Program of the European Union

Daugiau informacijos / More information:

1. Apie net-UBIEP projektą / About Net-UBIEP project: http://www.net-ubiep.eu/lt/home-lt/
2. Apie BIM metodikos taikymą / About BIM methodology application: www.skaitmeninestatyba.lt
3. Apie statybų sektoriaus e-kompetencijų registrą / About the register of e-competencies in the construction sector: www.statreg.lt
4. Apie A, A+, A++ ir NZEB pastatų statybos technologijas / About A, A +, A ++ and NZEB building construction technologies: www.statybostaisykles.lt statybos taisyklių ir ENERGOTRAIN skiltis / building regulations and ENERGOTRAIN section

Net-UBIEP: D4.5-D25LT First Seminar with Public Administration and Owners, Tenants and Building Administrators

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

2.5 Slovakia

2.5.1 Course description and results

On **25 October 2018**, the first Net-UBIEP seminar for public administration, owners, tenants and building managers took place in Bratislava, Slovakia.

Slovak partners have set up the Net-UBIEP School of BIM in Slovakia. The training provided by the school is modular and open to further new modules. At present they have established 7 modules:

- MU1 - Basic module for public authorities;
- MU2 - basic module for owners of buildings;
- MU3 - basic module for facility managers;
- MP1 - basic module for professionals;
- MP2 - working with the software for BIM (for professionals);
- MP3 - planning fire protection in BIM (for professionals);
- MT1 - module for technicians and craftsmen;
- Certification module – under development - will be clarified as we have more details of using bSI platform.

During the classroom courses, Slovak partners were testing these modules:

- 1st seminar for PA, owners and facility managers (25 October 2018) and in second seminar for PA, owners and facility managers (25 April 2019);
- 1st and 2nd training sessions for professionals (1 - 2 April 2019);
- third training session for professionals (23-24 May 2019);
- in-class training for technicians (28 March 2019) - they had to organise the training for technicians in-class, as reading the information material using e-learning would be not enough for them and Slovak partners were delivering through this session practical demonstrations for augmented reality using phones, tablets and 3D-glasses; and they could personally test working with 3D-glasses (this exercise was prepared by a company affiliated to the school.

The Net-UBIEP School of BIM is supported by affiliates that include: construction association, Chamber of Architects, training institute, providers of software (for the moment only Revit, but others are interested to come), many technical companies that are providing BIM related services (mostly SMEs) for integrated planning, construction and facility management (still we have to cover liquidation and recycling), architect studios.
These affiliates provide input to the training, provide speakers, equipment for practical demonstrations and exercises (Slovak partners have established a rule that they are neutral in respect of brand - so no company presentations allowed) etc. The network is growing.
Certainly, this school will continue to work beyond expiry of the project and they already have many plans with their affiliates.

The course programme for public administration, owners, tenants and building managers consisted of 6 academic hours combining theoretical part with application examples (case studies).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

A group of **36 participants** which work in public administration are building owners, tenants or building administrators had undertaken the classroom course in Slovakia within the framework of the Net-UBIEP project.

Main objectives of the seminar:

- Present the most important elements of the BIM system and the benefits of this method of visualisation for public administrations, owners, tenants and building managers;
- Explain how the use of BIM can contribute to efforts to improve the energy performance of buildings, during procurement, the authorization process and in particular during in-service management;
- Demonstrate how to work with BIM, using animation and using a real digital model;
- To initiate a discussion on how to proceed to successfully introduce BIM into the approval process.

Individual objectives of the seminar:

- Introducing BIM for use in the authorization process;
- Explaining the link between efforts to improve the energy performance of a building during its life cycle and BIM;
- Explanation of the functions available in BIM to achieve the best possible energy performance and to demonstrate - check compliance with energy performance requirements;
- Explaining the functions to ensure the best energy efficiency of the building during its use;
- Demonstration of working with a digital building model using preview software and existing building models;
- Draft list of tasks and targets for the successful implementation of BIM in the legislative procedures for building approval procedures.
- Informing target groups of users about the possibilities to improve their work with BIM technologies.

Main topics, focus which were discussed in more detail:

- How BIM assists users in achieving the desired energy efficiency of the building during the various phases of the building's life cycle;
- What tools must target audiences to benefit from BIM;
- How to digitize a building model so that it can be handled efficiently in the performance of its duties.
- The infrastructure and training needed for users to perform their work tasks with BIM.

Learning outcomes from the 3D Net-UBIEP competence model

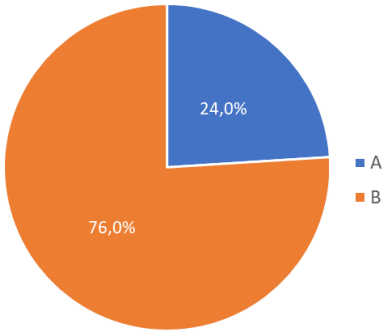
- PA.LO1. Identifying the benefits of using BIM during the building life cycle;
- PA.LO2. Model quality assurance through the use of building model control software;
- PA.LO3. Setting requirements for the management, coordination and storage of energy performance data in CDE;
- PA.LO4. Use of free apps and technologies to control model quality.

Several photos from the First Seminar with Public Administration, Owners, Tenants and Building Administrators conducted by the **ViaEuropa Competence Centre and UVS** can be found bellow.

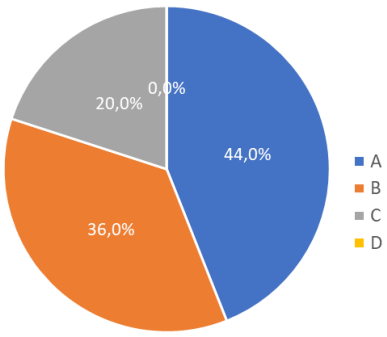
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Pre- and Post-training questionnaires were translated to Slovak language and filled by training participants. Few general conclusions from the classroom course validation from the participants in Slovakia is given below, while the entire questionnaire analysis is performed in deliverable *D27-D4.7 Survey and or interview among all different Targets*. Due to the fact that validation was performed in partners' native language, the analysis below has both English questions and the same questions in native language.

1. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?	a) Yes b) No



15. Would BIM certification, support or training, benefit Your colleagues?	a) Absolutely b) Likely c) Possibly d) No



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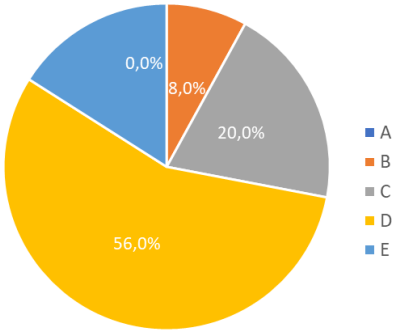
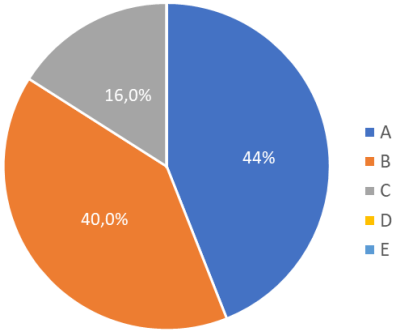
18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?	a) Excellent b) Very good c) Good d) Little e) I don't know



19. What overall rating would You give the course?	a) Excellent b) Very good c) Good d) Fair e) Poor



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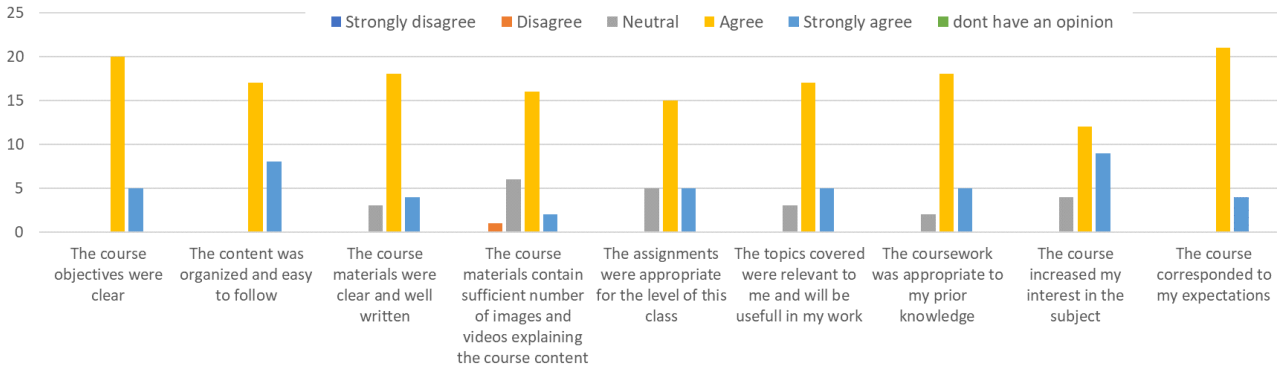
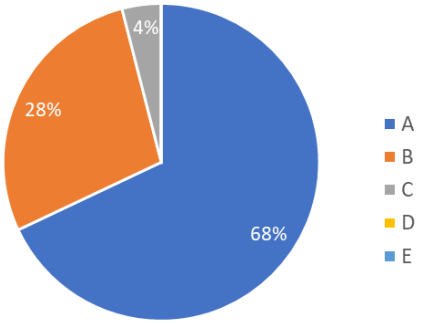
20. Please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The course objectives were clear.						
The content was organized and easy to follow.						
The course materials were clear and well written.						
The course materials contain sufficient number of images and videos explaining the course content.						
The assignments were appropriate for the level of this class.						
The topics covered were relevant to me and will be useful in my work.						
The coursework was appropriate to my prior knowledge.						
The course increased my interest in the subject.						
The course corresponded to my expectations.						



21. What overall rating would you give the trainer(s)?

a) Excellent
b) Very good
c) Good
d) Fair
e) Poor



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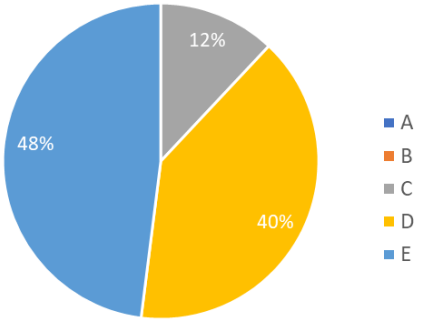
23. How much new information did you receive in the training course?

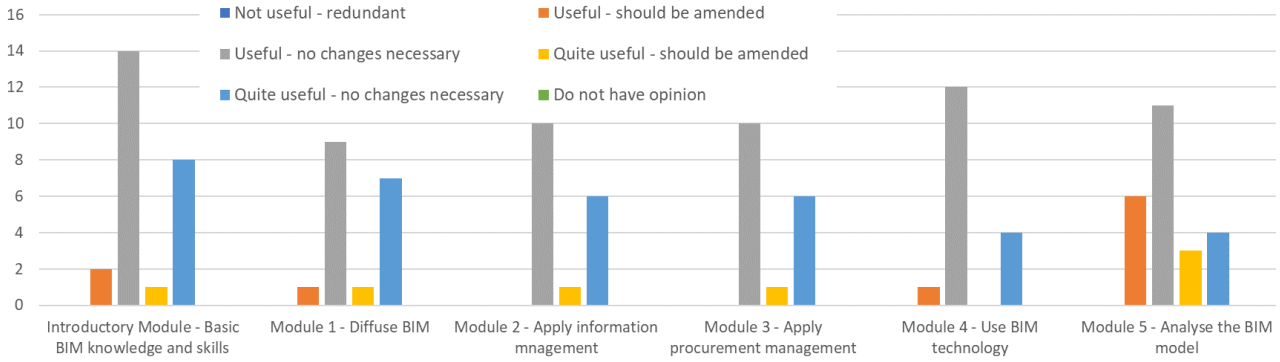
Rate on the scale from: 1 (none) to 5 (a lot of new information)

a) 1
b) 2
c) 3
d) 4
e) 5



25. Please rate the following BIM course modules based on how they are useful and interesting to You.

	Not useful - redundant	Useful – should be amended	Useful – no changes necessary	Quite useful – should be amended	Quite useful – no changes necessary	Do not have opinion
Introductory Module – Basic BIM knowledge and skills						
Module 1 – Diffuse BIM						
Module 2 – Apply information management						
Module 3 – Apply procurement management						
Module 4 – Use BIM technology						
Module 5 – Analyse the BIM Model						



26. What do You feel, is the training material comprehensive enough?

(Please mark all that apply)

a) Yes, it's adequate
b) It should contain more practical examples (best experiences)
c) It should contain more practical examples (existing issues in BIM)
d) It should give more country specific regulatory requirements

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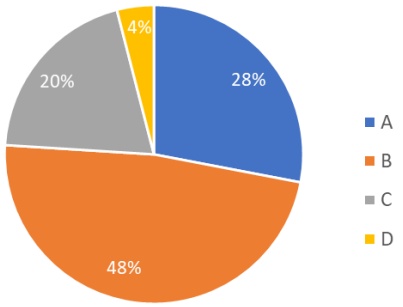
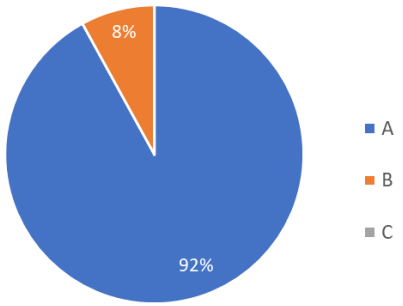
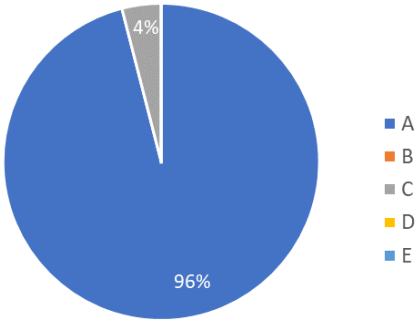


27. What do You feel about the duration of the training?	a) It is adequate b) It should be longer c) It should be shorter



28. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Definitely b) Probably c) Not sure d) Probably not e) Definitely not



29. Would you prefer to take this course online or in the classroom?	a) Online (e-learning) b) Classroom

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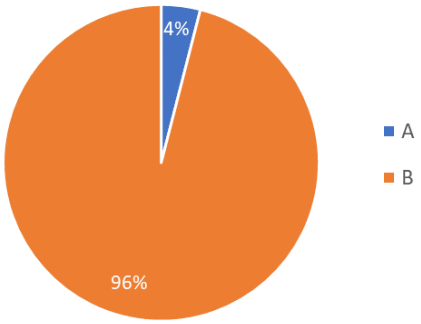

It is evident from the training validation results that 80 % of participants feel BIM certification, support or training would absolutely (44 %) or likely (36 %) be beneficial to their colleagues which is a good indication of their view about the necessity of certification courses. Additionally, after the course, training participants were asked to evaluate their competences prior to the classroom course on BIM. The intention was to get the information what is their initial knowledge on BIM as well as to see whether the course was an "eye opener" and comprehensive enough. The participants replied that they feel they had little (56 %) or good (20 %) and very good (8 %) competences while 16 % don't know what are their competences. Since 76.0 % of course participants are not using BIM this was to be expected for the case of Slovakia. The overall rating of the course as good (16 %), very good (40 %) and excellent (44 %) is very encouraging and positive for the developed training materials and courses held in Slovakia. Trainers received positive overall rating of very good (28 %) and excellent (68 %).

The majority of course participants agree to the statements that the course objectives were clear, with organized and easy to follow content. They mainly agree that course materials were clear and well written and contain sufficient number of images and videos explaining the course content. The positive validation of the Slovak course is also evident from the fact that the majority of participants agree that assignments were appropriate for the level of this class (appropriate to their prior knowledge) and the topics covered are relevant and will be useful in their future work as they received new information (88 % of participants feel they got significant amount of new information). The course also increased their interest in the subject and corresponded to their expectations.

When getting more in depth and looking for their opinion on each of the training modules, participants feel that Introductory module, Module 1 -5 are useful or quite useful and no changes are necessary even though there are some participants that feel Module 5 should be amended. On the other hand, significant number of course participants declared more practical examples are needed (best experiences and existing issues in BIM), 48 % and 20 % respectively, while only 28 % declared that existing training materials are adequate. Regarding the duration of training, 92 % of training participants said that 6-hour training course is adequate, while 8 % think it should be longer. It has to be enhanced that 96 % of the course participants prefer to take this course in the classroom while only 4 % would prefer to take it on-line.

The quality of the course is best rated if training participants disseminated and recommend the course to their colleagues, friends and associates, and in the case of Slovak classroom course for public administration, owners, tenants and building managers, 96 % of participants declared they would be definitely willing to disseminate the BIM training courses among their contacts.

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2.5.2 Agenda

4. Program

DOPOLUDŇAJŠÍ PROGRAM		
čas	*Téma a prednášajúci*	*Forma a metódy*
	Úvod	
09:00	**Úvod do Net-UBIEP projektu**: *úloha digitalizácie pri objavovaní benefitov Construction 4.0* RNDr. Ing. František Doktor, Via Europa	Videoukážky a powerpoint prezentácia
	Prvá časť: BIM a Stavebné úrady	
09:30	**BIM pri získavaní stavebného povolenia**: • výhody pre udeľovanie povolení; • prínos pre administratívne procesy; • prepojenie s ďalšími informačnými systémami; • ďalšie výhody: zdaňovanie, emisné kvóty CO2 atď. D.I. Petr Matyáš, DiS	Powerpoint prezentácia
10:15	*Diskusia*	
10:30	*Prestávka na občerstvenie*	
	Druhá časť	
10:45	**Ukážka práce s BIM** • Páca s digitálnym modelom budov • Výhody digitálneho modelu pre navrhovanie, povolenie a realizáciu Ing. arch. Ivor Mečiar, ArtD. FA STU	Práca v programe s technológiou BIM
11:30	*Diskusia*	
12:00	*Obed*	
POPOLUDŇAJŠÍ PROGRAM		
	Tretia časť: BIM a majitelia, nájomníci a správcovia budov	
13:00	**Ako môžu BIM používať majitelia budov**: • BIM pre správu majetku; • Využitie BIM v procese údržby budov; • Využitie BIM pri neočakávanej údržbe; • Využitie BIM pri vykazovaní energetickej efektívnosti budov. Ing.arch. Ivor Mečiar, ArtD. FA STU	Powerpoint prezentácia
13:30	*Diskusia*	
	Štvrtá časť:	

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14:00	**Diskusia :** • Informácie o možnostiach zdokonaľovania sa v BIM; • Možnosti technickej podpory.	Diskusia
15:00	**Záverečné zhrnutie.** Ing. Marta Minarovičová, UVS	

4. Program

5. Odporúčaná príprava na seminár

Net-UBIEP Informačný materiál pre orgány verejnej správy, Net-UBIEP projekt 2018
Net-UBIEP Informačný materiál pre vlastníkov, Net-UBIEP projekt 2018

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2.6 Spain

2.1.1 Course description and results

First Seminar with Public Administration, Owners, Tenants and Building Administrators was organized on **October 16th 2018** in Madrid, Spain.
A group of **23 participants** which work in public administration are building owners, tenants or building administrators had undertaken the classroom course in Spain within the framework of the Net-UBIEP project. Several photos from the First Seminar with Public Administration, Owners, Tenants and Building Administrators conducted by the **FLC** can be found bellow.

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Pre- and Post-training questionnaires were translated to Spanish language but only pre-training questionnaire was filled by training participants. Since Spanish partners agreed that the post – training questionnaires were quite similar, training participants did not provide any answer to them.
For the reason of lacking post-training questionnaire results validation of classroom courses held in Spain cannot be completed.

Never the less, the stakeholder feedback was collected by project partners orally during round table and small group discussions.
Analysis of the training results, problems and solutions together with lessons learned during the courses are as follows:

- The attendees showed great interest in BIM and, specifically, in the training carried out at Net-Ubiep.
- Since BIM Maturity level in Spain is quite high and on the other hand NZEB is at lower levels the audience was very interested in this methodology which seeks to improve the energy performance of buildings through the use of BIM during the building's life cycle.
- The attendees discussed the relationship between BIM technology and nZEB construction (BIM implementation level, the software used for each activity carried out, etc.), the interactions of nZEB buildings and building certificates (nZEB regulation in Spain, software and methodology to design buildings based on energy demand...), regulatory aspects to take into account in the educational materials
- It was suggested that more practical examples should be implemented into the training.
- Participants declared they would be willing to disseminate the information about Net-UBIEP BIM and NZEB training courses among their contacts

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2.1.2 Agenda

Net-UBIEP Project

Network for Using BIM to Increase the Energy Buildings Performance

"Workshop "Network for Using BIM to Increase the Energy Performance"

AGENDA

15:30	El Edificio de consumo casi nulo. Conceo y criterios reglamentarios. Indicadores	Luis Vega Catalán - Ministerio de Fomento
15:45	Nuevo borrador del DB HE del CTE	Rafael Villar - IETCC.CSIC
16:15	Presentación del proyecto Net-UBIEP	Javier González - FLC
16:30	Building information modeling. BIM y su relación con el Edificio de consumo casi nulo	José A. Tenorio - IETCC.CSIC
16:45	Herramientas BIM disponibles en el mercado	CYPE
17:00	Debate y conclusiones	
17:30	Fin del workshop	

2.7 The Netherlands

2.7.1 Course description and results

First Seminar with Public Administration, Owners, Tenants and Building Administrators was organized on **January 31st 2019** in s-Hertogenbosch, The Netherlands, during the final conference "Municipalities and BIM".
Since Public authorities, Professional Owners and Tenants as well as Building administrators already have projects in the Netherlands to widespread the use of BIM, the Dutch partners participated in a meeting and presented the developed material in the Net-UBIEP project. This initiative is called: “Routekaart gemeenten en BIM” and ISSO added their and Net-UBIEP developed knowledge to this initiative.

A group of **17 participants** which work in public administration are building owners, tenants or building administrators have participated to the meeting in The Netherlands within the framework of the Net-UBIEP project.

The Dutch partners provided an explanation why there were only several participants for the professional trainings. Dutch partners are trying to get more people interested in the professional training via the professional networks of ISSO, B&R, TVVL, the Net-UBIEP website, LinkedIn and BIMloket, but so far, we had little success.

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The reasons for this are:

- A large part of the Dutch construction sector has already some professional education or knowledge on BIM. Also, professionals are already trained in some degree on nZEB in the last years. Added value of Net-UBIEP project is to create a link between these subjects. However, it is very difficult to convey possible participants of this added value.
- Lack of time: the Dutch construction sector is at its peak. Moreover, employees are scarce at the moment. Therefore, the existing workforce is very busy with their construction projects instead of educating themselves. To solve this, we are building an e-learning module for professionals so people can follow the course at their convenience.
- Legislation (NTA8800/BENG) in The Netherlands about nZEB is changing in 2018 and 2019 and is not yet final. A lot of the workforce is waiting with training until there is more clarity about the legislation. After this we expect things will go faster.

In other words, things are going slower than expected. However, Dutch partners are trying to disseminate the results and the education material with professional educators who expressed interest. So, they think the results and materials will be used by these professional educators, but this is a slow process.

A photo from the First Seminar with Public Administration, Owners, Tenants and Building Administrators conducted by **ISSO** can be found bellow.

Pre- and Post-training questionnaires were translated to Dutch language in order to be filled easier by training participants. Dutch partners used Googleforms version of questionnaires for the course validation which was sent to training participants.
Sadly, no answers were collected for the post-training questionnaire since training participants did not fill the questionnaires. Possible reasons for these could be that the questionnaire is comprehensive and they estimated it would take a significant time to fill it. The other reason could be that the participants of the seminar were representatives of public administration, building owners, tenants or building administrators and they are handling topics related to BIM and energy efficiency in their respective institutions and companies, while the questionnaire which is asking about their competences could be counterproductive and the results could be that people handling these important issues do not have adequate competences. The third reason could be that they (training participants) do not want to state the opinion which is not an official one regarding the implementation of BIM into energy efficiency projects.

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For the reason of lacking post-training questionnaire results validation of First Seminar with Public Administration, Owners, Tenants and Building Administrators held in The Netherlands cannot be completed.

Never the less, the stakeholder feedback was collected by project partners orally during round table and small group discussions.

Analysis of the training results, problems and solutions together with lessons learned during the courses are as follows:

- Various municipalities have contacts that could be put to good use, but in order to make good use of the budget, the partners focused on those representatives which were very enthusiastic, which have a great chance of success.
- Due to the BIM maturity level in The Netherlands as well as the energy efficiency and NZEB development level, and the existence of many education courses on these topics, there was a general consensus from the discussions that the results and materials of the Net-UBIEP project should be offered to existing professional educators in BIM and NZEB. They could then include them into their existing courses, to improve their existing courses and to ensure the sustainability of Net-UBIEP project results.
- A model step-by-step plan should be drawn up for the use of BIM for municipal tasks. This is a first means to enable a broad implementation, since it should be possible for each municipality or municipal partnership to have its own interpretation. After all, the priorities, the levels of ambition and the organizational setting with different roles can be very different. Net-UBIEP project results fit in here perfectly since they enable for public authorities, owners, building administrators to gain basic knowledge on BIM as well as the possibilities of using BIM for energy efficiency purposes in order to make an educated decision.

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2.7.2 Agenda

Agenda

31 jan

Den Bosch
10:00 - 18:00
31 januari 2019

Symposium 'BIM en Gemeenten'

Ook in de bouw gaat de digitalisering razendsnel. Uw gemeente krijgt wellicht al 3D-modellen aangeleverd bij een vergunningaanvraag of aanvragen voor digitale areaalinformatie. Steeds meer gemeenten ontdekken de voordelen van het Bouw Informatie Model, kortweg BIM. Een applicatie waarmee bevoegd gezag, opdrachtgever, architect, ingenieur, aannemer en installateur digitaal samenwerken. Zo kunt u bijvoorbeeld van tevoren zien hoe een bouwwerk wordt ingepast in de bestaande bebouwing of u krijgt een goed overzicht van de staat van onderhoud van het gemeentelijk vastgoed. Zo kunnen we slimmer en efficiënter werken, waardoor veel kosten worden bespaard.

Wilt u weten wat het gebruik van BIM voor uw gemeente kan betekenen? Kom dan op donderdag 31 januari 2019 naar de conferentie 'Gemeenten en BIM' in 's-Hertogenbosch.

Programma

- ***12:00*** *Inloop met lunch*
- ***13:00*** *Dagopening door o.a. Jack Mikkers, burgemeester van 's Hertogenbosch en Irma Woestenberg, voorzitter VNG Taskforce Samen Organiseren*
- ***13:30*** *Gemeenten & BIM. Verschillende sprekers – zowel van gemeenten als andere organisaties - komen aan het woord over de toepassingen van BIM voor gemeentelijke opgaves. Ook de verschillende pilots komen aan bod.*
- ***14:30*** *Rondetafelgesprekken. Ga in twee rondes op interactieve wijze in gesprek over de toepassingen van BIM en de kansen voor u en uw gemeente. Schuif aan tafel bij een van de volgende thema's:*

1. *Data op orde*
2. *Vastgoedbezit & beheer*
3. *Openbare Ruimte*
4. *Omgevingswet/Vergunningen*
5. *Samen Werken met BIM*

- ***15:45*** *Gemeenten & de bouwwereld. Hoe wordt vanuit de bouwwereld (MKB) gekeken naar de rol van gemeenten? Door Albert Martinus, voorzitter stichting Rondom GWW*
- ***16:00*** *Forumdiscussie*
- ***16:30*** *Afsluiting & Slotwoord*
- ***16:45*** *Borrel*

Doelgroep

De conferentie is primair bedoeld voor management, projectleiders en inhoudelijk adviseurs, die in hun gemeente betrokken zijn bij de vergunningverlening en/of totstandkoming c.q. het beheer van gebouwen, infrastructuur en openbare ruimte. Zij krijgen dan ook voorrang bij de inschrijving.

Praktische informatie

- ***Datum****: Donderdag 31 januari 2019*
- ***Tijd****: 12.00-17.00 uur (inclusief lunch)*
- ***Locatie****: Bestuurscentrum gemeente 's-Hertogenbosch, Achter het Stadhuis 5-7, 's-Hertogenbosch*
- ***Kosten****: Deelname is kosteloos; wel vragen wij u om zich aan te melden*

Aanmelden

Wilt u de bijeenkomst bijwonen, dan vragen wij u om zich aan te melden. U kunt zich via de aanmeldlink aanmelden voor de conferentie 'Gemeenten en BIM'. Hierop kunt u ook eventuele dieetwensen aangeven.

Meer weten?

Wilt u zich alvast verdiepen in de activiteiten die er rondom BIM plaatsvinden? Lees dan meer over de verschillende pilots die dit jaar zijn uitgevoerd.

1. *De eerste pilot betreft de ontwikkeling van een routekaart, die vanuit de diverse gemeentelijke rollen (bevoegd gezag, eigenaar en beheerder van vastgoed en van de openbare ruimte, bronhouder van areaalgegevens), aangeeft welke stappen gezet kunnen worden om met BIM te werken.*
2. *De tweede pilot gaat over hoe je gezamenlijk met BIM kunt werken, zowel samen met buurgemeenten als met regionale bouwpartners (MKB).*
3. *De derde pilot gaat over het versnellen en vereenvoudigen van de vergunningverlening voor bouwaanvragen met behulp van een digitaal ontwerp in 3D (BIM).*

De resultaten van deze pilots worden gepresenteerd tijdens de conferentie.

Wij hopen u te ontmoeten op donderdag 31 januari!

De conferentie 'Gemeenten en BIM' wordt georganiseerd door de pilotgemeenten in samenwerking met BIM-loket en VNG-Realisatie en ondersteund door Building Changes en Corstens Informatiearchitectuur.

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This deliverable reflects only the author's view. The Agency is not responsible for any use that may be made of the information it contains.

The present deliverable will be update during the project in order to align the outcome to the market needs as well as to other BIM related projects realized within Horizon 2020 program.

The updated version of the deliverable will be only available in the website of the project www.net-ubiep.eu.

Some deliverables could also be translated in partners national languages and could be find in the respective national web pages. Click on the flags to open the correspondence pages:

International web page

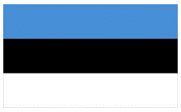
Italian web page

Croatian web page

Slovak web page

Spanish web page

Dutch web page



Estonian web page

Lithuanian web page

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