CBIM - European Training Network

Cloud-based Building Information Modelling

Cloud-Based Building Information Modelling

H2020-MSCA-ITN-2019

D7.2 First Year Progress Report

WP7

March 2021 (M13)

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Date	Version	Author	Comment
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23/03/2021	1.0	TRDF, UCAM	Complete document for review

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Abbreviations and Acronyms

Acronym	Description
CBIM	Cloud-Based Building Information Modelling
ESR	Early-Stage Researcher
IPR	Intellectual Property Rights
BIM	Building Information Modelling

CBIM - European Training Network
Cloud-based Building Information Modelling

Executive Summary

CBIM is a European Training Network in the area of Cloud-based Building Information Modelling. The project began formally on March 1st, 2020. The set-up period of the project started on October 1st, 2020 after formally signing of the Grant Agreement and the Consortium Agreement. We have undertaken a rigorous recruitment procedure, with 142 applicants applying for 14 positions. We believe that we have selected a superb team of ESRs and all fourteen ESR's have begun their studies.

Under normal circumstances the recruitment process and coordination activities would be much easier to execute, however, unfortunately not long after the CBIM project was launched, the COVID 19 pandemic entered our life and changed the world as we knew it. We carried out recruitment interviews via Zoom and organized meetings that would have been convened at beneficiaries' premises via Zoom as well.

We have succeeded, against all odds, in relocating the 14 ESRs from their countries of origin to their hosts despite different restrictions concerning travel and entry of foreign citizens to some of the hosting countries. Having said that, some of the ESRs were forced to delay their start. The last ESR began on December 1st 2020, two months later than originally planned, but still leaving more than enough time to complete their 36 month period before the end of the project as a whole.

We have established a full organizational structure for the project and nominated candidates to the various committees. We held two general meetings: a kick-off meeting in July 2020 and a Supervisory Board annual meeting in March 2021.

As part of the training activities, we have executed two on-line training events: *Building Information Modelling & Research Fundamentals* in December 2020 and a study module on *Data Modelling*. In addition, each of the 14 ESRs developed a tailor-made Personal Career Development Plan with the support of their academic advisors.

Various Internet and social dissemination channels have been established to expose CBIM activities and achievements to a vast audience.

As we start the second year of the CBIM program, we can state that we are moving ahead as planned. We are looking forward to the next training events, while hoping that the pandemic crisis will be over soon and all of us could attend meetings, training events, seminars and conferences face to face again and continue to research and enjoy the synergy of the entire CBIM team.

This is the place to convey our thanks to our EU grant officers: Maria Vili and Szymon Sroda. Both have been very helpful throughout the launch period of the project and were attentive to our requests to make some changes due to the unique situation that was created by COVID 19 (such as changes of schedules, replacing on-site studies with remote studies, etc.)

1 Introduction

1.1 Purpose and target group

This report is intended for the CBIM beneficiaries, ESRs, partners, the EU project administration, and the public.

1.2 Contributions of partners

The following Table 1 depicts the main contributions from participant partners in the development of this deliverable.

Table 1: Contribution of partners

Participant short name	Contributions
TRDF	Content for sections 1, 3.4, 5, 6 and 7. Compilation of the report.
UCAM	Content for section 3.1
LOCLAB	Content for section 2
TUB	Content for sections 3.2 and 4
UCL	Content for section 3 introduction, sections 3.5 and 3.6
CARTIF	Content for section 3.3

1.3 Relation to other activities in the project

The following Table 2 depicts the main relationship of this deliverable to other activities (or deliverables) developed within the CBIM Project and that should be considered along with this document for further understanding of its contents.

Table 2: Relation to other activities in the project

Deliverable Number	Contributions
D7.2	This deliverable provides the overall description of the progress made in CBIM project during the 1st year.

2   ESR Recruitment

2.1   Time schedule

Start: November 27, 2019: Call for applicants was published (see also 1.3)

End: 19 May 2020: All job ads have been deactivated.

2.2   Application procedure

From the end of November onwards, the call for applications was published on various channels (see 1.3). The applicants were called upon to submit their applications digitally with the following contents:

- Motivational Letter, i.e. a cover letter explaining why the candidate is interested in participating in the CBIM project,

- CV / resume

- Certificates, if applicable

- Three ESR positions in preferred order.

All applications were filed in a central folder and entered in an application register. The CBIM Recruitment Coordinator (REOC), Dr. Ilka May, carried out a formal eligibility test. This examination mainly comprised three points:

1) Compliance with the ESR rule (no more than four years since first Master's degree),
2) Compliance with the transnational mobility rule
3) Provision of the three ESR preferences.

The details of the formal eligibility requirements 1 and 2 can be found here.

For those applicants who passed the eligibility test, an initial assessment was made by the REOC and the Coordinator and made available to the other consortium partners in the application register. This was to ensure an efficient and at the same time transparent assessment of all eligible applicants.

Subsequently, the applications were handed over to the first-choice host for review. Interviews were organized and conducted by the host organizations on their own initiative.

If a candidate turned out not to be suitable for the first preference, he or she were referred to the second preference for consideration and examination.

If the evaluation was positive, a commitment was made directly by the host.

Official rejections, which led to exclusion from the application procedure, were made exclusively by the REOC, either for formal reasons in case of non-compliance with the eligibility test or after professional examination by the respective hosts.
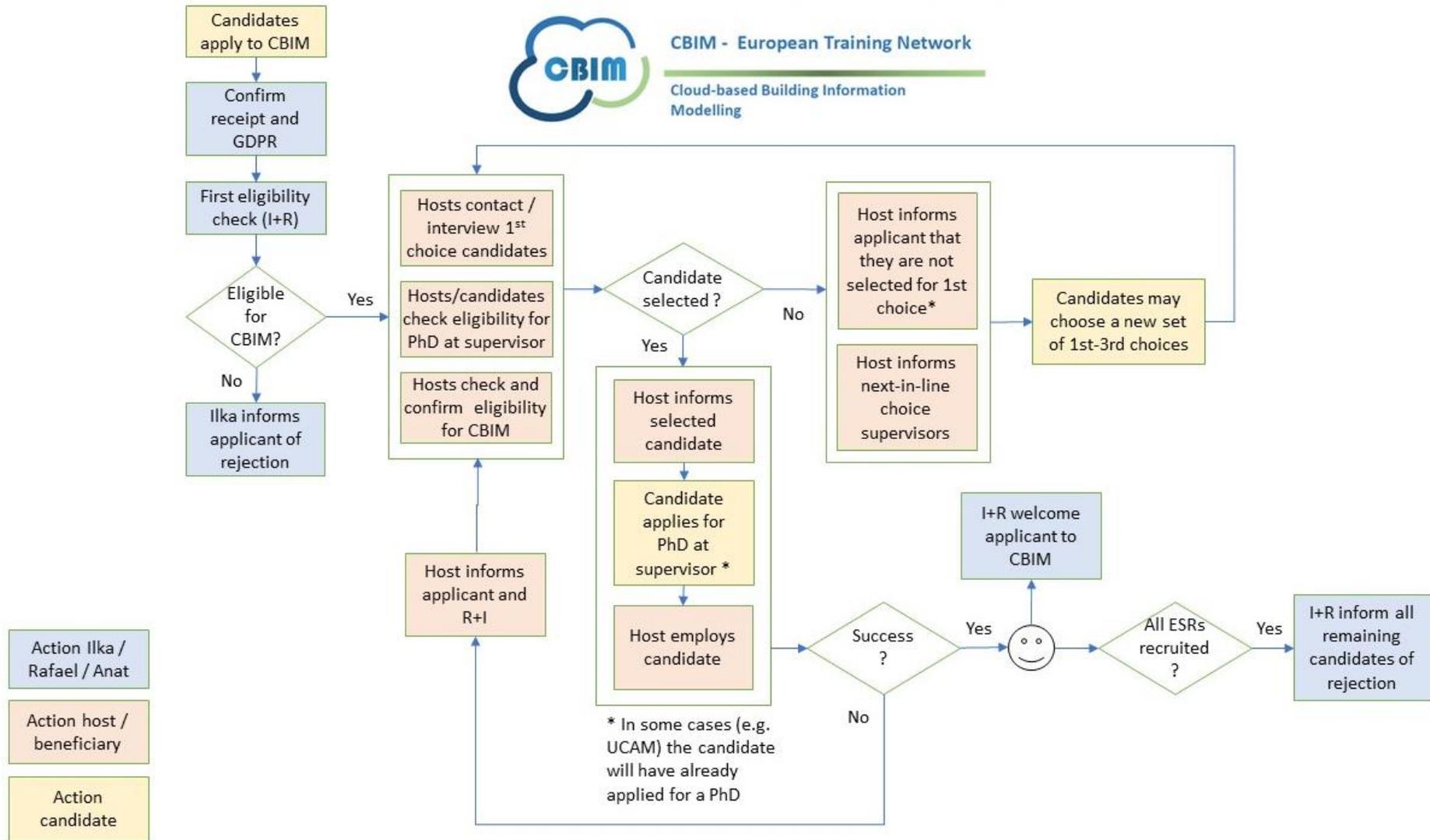
Figure 1. CBIM Recruitment Process (Note: Ilka May – Recruitment Coordinator; Rafael Sacks – Project Coordinator; Anat Avital – Project Administrator; I+R = Ilka May and Rafael Sacks).

2.3   Publication of the call for applications

The call for applications was published on the following channels:

Table 3: Call for participants distribution – portals and websites

Name	Region	Target list/site
Euraxess	Europe	https://euraxess.ec.europa.eu/
Find a job	UK	https://www.jobs.ac.uk/
Academic Transfer	Netherlands	https://www.academictransfer.com/en/
Findaphd	UK	https://www.findaphd.com/
European Construction Technology Platform	Europe	-

Table 4: Call for participants distribution – mailing lists

Name	Region	Target list/site
Co-operative Network for Building Researchers	Global	cnbr-l@yahoogroups.com
International Group for Lean Construction	Global	iglc@yahoogroups.com
ASCE Construction Research Council	US and global	asce_crc@googlegroups.com
ASCE DSA and VIMS Committees	US and global	asce_dsa_vims@googlegroups.com
EC3 mailing list	Europe	
European Construction Technology Platform	Europe	
Construction block-chain consortium	Europe	https://www.constructionblockchain.org/
CITA Alliance	Ireland	https://www.cita.ie/

In addition, the call for applications was shared in social media (e.g. LinkedIn) by the consortium partners and the direct channels of the universities and other partners were used.

A detailed description of the project and the call for applications were published on the project's own website:

https://cbim2020.net.technion.ac.il/recruitment/

2.4   Administration and compliance with the GDPR policy

For administrative purposes, a protected folder was created in the one-drive environment of the Technion coordinator. In this folder, a central applicant register was created by the REOC, in which all incoming applications were recorded. For each application, a central sub-folder was created in which all incoming data (CVs, certificates, e-mail correspondence, interview protocols, etc.) were stored.

All applicants received a confirmation email from the REOC shortly after receipt of their application, informing them, among other things, that their personal data would be stored on the project's one-drive for the required period of time and would be made available to the consortium partners. Applicants have been explicitly given the opportunity to opt out of this.

The status of the applications was discussed and coordinated in several meetings, all of which took place virtually as video or telephone calls, using the central register of applicants.

2.5   Gender diversity

At total of 141 candidates applied for a role. 52 candidates didn't meet the eligibility criteria and had to be rejected by the REOC. 14 candidates were finally selected.

Of the total 141 applicants, 65% were male and 26% female. For some of the applicants it was not possible to draw any reliable conclusions about their gender.

Among the 89 candidates who passed the formal eligibility test, the proportion of male candidates was as high as 71% and that of female candidates 29%.

Among the 14 candidates selected for the programme, there is a balance between female (7) and male (7).

Table 5: Gender distribution – applicants, eligible, accepted

	Total	Female	Male	Unknown
Applicants	141	36 (26%)	91 (65%)	9 (6%)
Eligible	89	26 (29%)	63 (71%)	
Accepted	14	7 (50%)	7 (50%)	

2.6   Regional diversity

2.6.1   Eligible candidates by region

The regional evaluation was only carried out for the 89 candidates who successfully passed the eligibility test.

Five regions were defined:

1. Europe (including Russia and Turkey)
2. Americas (Latin America and USA)
3. Africa
4. Middle East / India (including Pakistan)
5. Asia

The evaluation shows a relatively balanced regional distribution with the highest number of applicants from Europe and the lowest number from America.

Table 6: Geographical distribution of eligible, candidates

	Total	Region				
	Total	Europe	Americas	Africa	Middle East / India	Asia
Eligible	89	28	10	13	22	16
Percent		31%	11%	15%	25%	18%
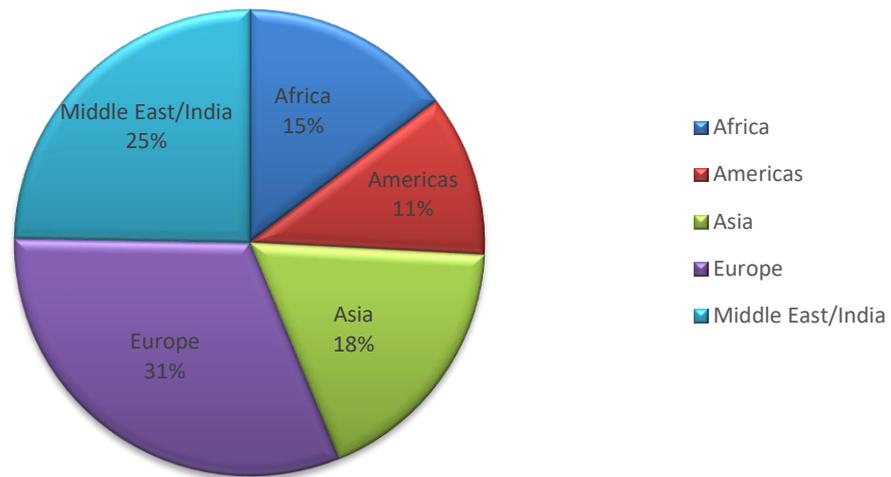
Figure 2. Regional distribution of eligible candidates

2.6.2 Accepted candidates by region and country

Of the selected candidates, the majority come from Europe with 65%, followed by Asia and Africa with 14% each and America with 7%.
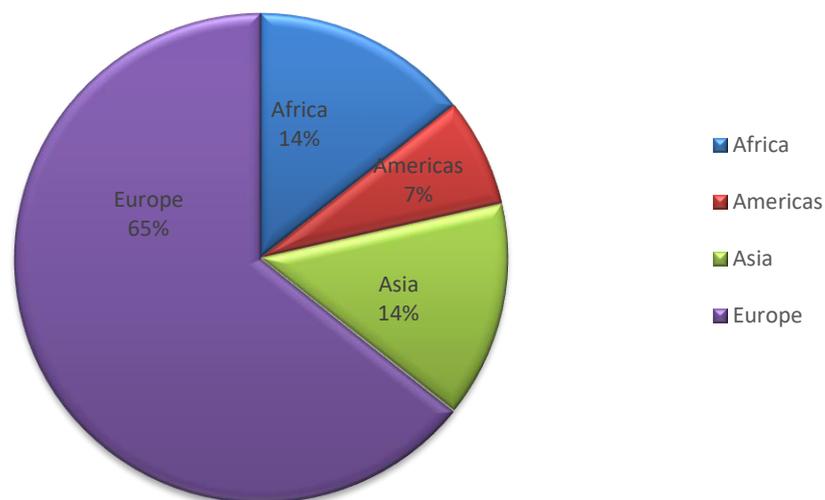
Figure 3. Regional distribution of selected candidates

Within these regions, the 14 selected candidates are spread over 12 countries: China and Turkey (2 each, and one from each of Ethiopia, Greece, Hungary, Ireland, Italy, Nigeria, Norway, Poland, Russia and USA.
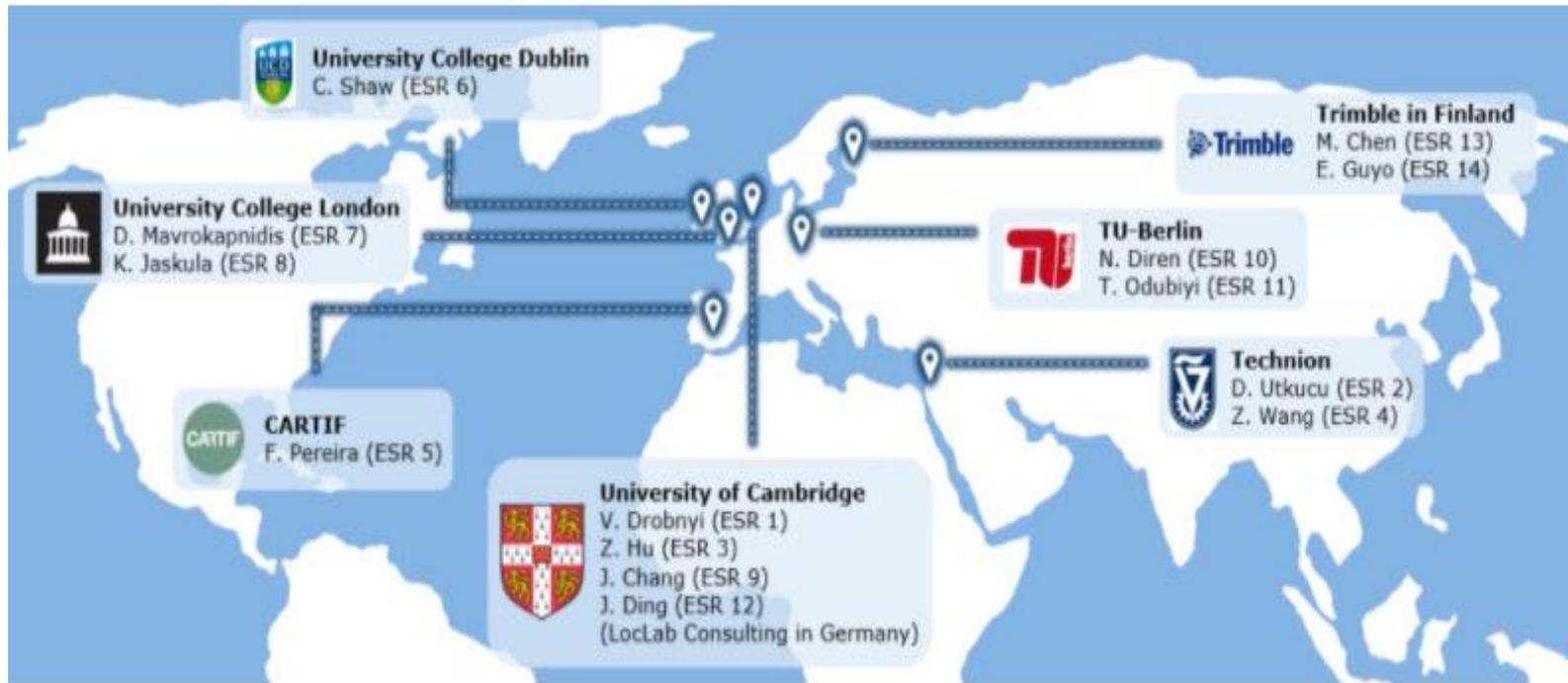
Figure 4. Distribution of selected candidates at beneficiaries.

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2.7   CBIM ESRs Team

Viktor Drobnyi
ESR 1
Infrastructure objects detection based on
cascaded deep learning architectures enhanced
with design priors

Duygu Utkucu
ESR 2
Object relationships detection and semantic
enrichment

Zhiqi Hu
ESR 3
Updating model geometry from registered point
cloud and image datasets

Zijian Wang
ESR 4
Graph representation of BIM models for machine
learning applications

Flavia de Andrade Pereira
ESR 5
BIM Enrichment for inclusion of Building
Automation System information

Conor Shaw
ESR 6
Data fusion for operational optimisation and
facility management

Dimitris Mavrokapnidis
ESR 7
BIM Model enrichment for Energy Performance
Simulation

Klaudia Jaskula
ESR 8
Blockchain-enabled CBIM for life-cycle
data provenance

Janet Chang
ESR 9
Lifecycle data management

Nihan Sena Diren
ESR 10
Development of cloud-based work processes
operating within distributed data environments

Tawakalitu Odubiyi
ESR 11
CBIM business models

Jialei Ding
ESR 12
Infrastructure digitisation and gamification

Mia Siyu Chen
ESR 13
Cloud-enabled BIM

Eyosias Dawit Guyo
ESR 14
Data standards integration

2.7.1 CBIM 14 ESRs Anonymous Survey

Table 7: Survey of ESRs

Questions	1	2	3	4	5
			Grades / No. of ESRs		
Do you feel on track so far with the research/training?			5	5	4
How sure are you about your research direction?		1	2	8	3
Do you feel sufficiently supported by the CBIM administration?			4	7	3
Do you feel sufficiently supported by your host institution administration?			1	4	9
Do you have good communication with your primary supervisor?				4	10
How well connected are you with other ESRs?			2	8	4
How well are you connected with your research institute (other PhD students, colleagues, research groups, social groups, etc.)?			2	7	5
Are you satisfied with the equipment for your work right now (laptop, SW, etc.)?				1	13
Is it clear for you how and in which cases to access the funds from the EU?	1	1	8	4	

Legend

1= Low grade

5=High grade

2.7.2 ESRs start / end dates

Table 8: ESR start and end dates

ESR	First Name	Last name	Beneficiary	Start date	End date
1	Victor	Drobnyi	UCAM	01/10/20	30/09/23
2	Duygu	Utkucu	TECHNION	05/11/20	04/11/23
3	Zhiqi	Hu	UCAM	01/10/20	30/09/23
4	Zijian	Wang	TECHNION	06/11/20	05/11/23
5	Flavia	De Andrade Pereira	CARTIF	07/09/20	06/09/23
6	Conor	Shaw	UCD	01/09/20	31/08/23
7	Dimitris	Mavrokapnidis	UCL	01/10/20	30/09/23
8	Klaudia	Jaskula	UCL	01/10/20	30/09/23
9	Janet	Yoon Chang	UCAM	02/10/20	30/09/23
10	Nihan Sena	Diren	TUB	18/12/20	17/12/23
11	Tawakalitu	Odubiyi	TUB	25/11/20	24/11/23
12	Jialei	Ding	LOCLAB	01/10/20	30/09/23
13	Siyu (Mia)	Chen	TRIMBLE	01/12/20	30/11/23
14	Eyosias Dawit	Guyo	TRIMBLE	01/11/20	31/10/23

3   Training Activities

3.1   TE1- UCAM

Building Information Modelling & Research Fundamentals

The Building Information Modelling School was held during 7-11 December 2020 and was the first in a series of training events sponsored by the Cloud BIM European Training Network (CBIM ETN). It served a dual purpose: (i) a broad introduction to BIM fundamentals and research methods; (ii) a bonding opportunity/community-development exercise for early-stage researchers and practitioners. The first part of this training event was familiarised students with BIM as a product and as a process, BIM tools, data models (e.g. the Industry Foundation Classes), BIM data exchange and cross-sector interoperability. The second part of this training event focused on research methods training, PhD project management, and ethics contextualised to the BIM area. Tutorials required students to get hands-on experience in collecting data and working with BIM models.

The school aimed to provide a stimulating opportunity for early-stage researchers (MS or PhD level), industry practitioners, post-doctoral research associates and interested faculty members alike. The participants benefited from direct interaction and discussions with world leaders in BIM, who delivered the online lectures covering both theoretical and practical aspects of real BIM problems as well as examples of their successful use in practice.

BIM School in numbers:

- ✓ 2 organisers
- ✓ 17 Instructors
- ✓ 28 hrs and 20 minutes lecture time
- ✓ Pre-readings, pre-videos
- ✓ Weeklong group project
- ✓ 39 students
- ✓ 14 ESR students
- ✓ 25 external students
- ✓ 100 applicants

- 39 students (25 external, 14 early stage researchers from CBIM)
- 69% male and 31% female
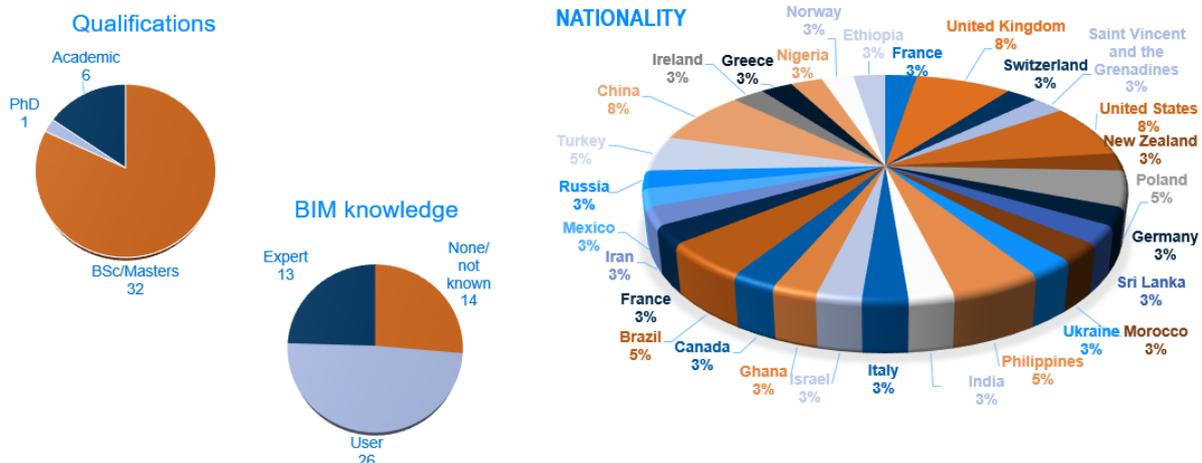- 29 nationalities, attending the school from time zones GMT-8 to GMT+12

Figure 5. TE1 - Distribution of students from different countries.

Monday	Tuesday	Wednesday	Thursday	Friday
Welcome and Introductions	**Introduction to STEP and EXPRESS** Kim Jung	**Mixed Reality for BIM and demonstration** Kim Nyberg	**BIM research challenges roadmap** Rafael Sacks	**Managing Research Data** Ryan Cronin
	Met LOs: **4.7** Overall: **4.3**	**4.9** **4.6**	**4.9** **4.9**	**4.7** **4.2**
Student introductions	**Current and upcoming openBIM standards** Thomas Liebich	**BIM tools and parametric modelling** Brenden Roche	**Structuring your research** Ioannis Brilakis	**Managing and writing your project** Ioannis Brilakis
	4.6 **4.4**	**4.5** **4.2**	**4.9** **4.7**	**4.9** **4.8**
		Lunch BIM project sessions Ying Hong/Mahendrini/Junqing		
		4.1 **3.7**		
Building Information Modelling: A concise introduction Rafael Sacks	**Data quality and related Issues: Model-checking, BCF Tutorial** Kim Nyberg	**Interoperability** Rafael Sacks	**Defining research questions, objectives and hypotheses** Dimitrios Rovas	**Responsible Research & Innovation; Equality, Diversity & Inclusion** Ilka May
Met LOs: **4.8** Overall: **4.5**	**4.6** **4.3**	**4.9** **4.9**	**4.6** **4.5**	**4.1** **3.7**
Working with BIM data: Tools & concepts James O'Donnell	**Developing a BIM model and performing basic queries** James O'Donnell/Tobias/Reihaneh	**Enabling quality information for better value and outcomes** Ross Dentten	**BIM research strategies** Timo Hartmann	**BIM project presentations** All students
4.5 **4.0**	**4.8** **4.6**	**4.6** **4.3**	**4.1** **3.9**	All groups and individual students passed (instructors and peer assessment)

Figure 6. TE-1 Program with student evaluation scores.

3.2 Module 1 – Data Modelling – TUB

PhD School on Product Modelling and Management

Dates: Nov, 2nd 2020 – Feb, 23rd 2021

Organiser: Timo Hartmann, TU Berlin

Outline of the programme

Learning Goals: At the end of the module, students will understand the basics of product modelling theory, which not only forms the basis of state-of-the-art Building Information Systems, parametric modelling systems, and advanced integrated simulation platforms. With this knowledge about product modelling students will be able to organize and structure any complex engineering effort within the realm of civil engineering with or without the support of computers. Students will know the theoretical underpinnings of ontologies and information models from the viewpoint of semiotic theory and logic. Students will also understand related concepts such as level of detail, abstraction, and interpretation and can apply these concepts to computationally model engineered systems to support knowledge intensive engineering work. Students will gain the required skills to represent and describe all type of civil engineering objects with their components, functions, and properties ranging from buildings to infrastructure. Additionally, students will know advanced methods of parametric modelling to steer the geometric configuration of a system based on a few carefully selected input parameters.

To ground the theoretical part of the module, students will also gain practical hands-on experiences modelling complex infrastructure and building systems using state of the art ontology modelling software. Additionally, students will get to know rich practical case studies and advanced topics from

the field of systems engineering that will help them to deeply grasp the importance for adequate models to support the engineering of complex civil infrastructure and building systems. Among these concepts are for example ontological reasoning, parametric modelling, requirements management, configuration management, information management, cost and risk engineering, or control engineering.

<u>Expected Learning Outcomes</u>

- Use semantical and ontological modelling to describe civil engineered systems

- Use ontological reasoning and logic with applications to civil engineering

- Basics of geometric modelling and parametric modelling for civil engineered systems

- Model scales and interfaces between products, their components and functions

<u>Participants</u>

14 ESRs + 44 students of TU Berlin from Civil Engineering, Industrial Engineering, and Civil Systems Engineering took this module.

<u>Main achievements:</u>

- After following the module all ESRs now understand ontological and parametrical modelling as the basis of Building Information Modelling (BIM).
- Some ESRs can also leverage the methodologies taught in the course - ontological modelling with Protégé and parametric modelling with Dynamo - within their planned research activities.

3.3   TE2-CARTIF

BIM-based Sensing and Data Collection

This school is the second training event from the Cloud BIM European Training Network, organised by the CARTIF Technology Centre.

The school will be held during 24th – 26th May, 2021. It offers early-stage researchers, industry practitioners and interested faculty members alike the opportunity to attend a series of key lectures given by experts in the field of sensing and data collection. The event will offer a general introduction to theoretical concepts relevant to sensing, data acquisition and storage. This includes sensor hardware fundamentals, data types (point-clouds, building sensor data, RGB/D and thermographic imagery, etc.), and quality evaluation metrics. Students will experience the configuration, data collection and quality management mechanisms through a hands-on exercise based on CARTIF premises.

For more details please review TE2 web site:

https://www.cartif.es/en/cbim-etn-second-training-event/

3.4   Revised Secondments Plan

COVID19 pandemic set a few obstacles to executing the secondments as originally planned since some of the ESRs started the program later than planned and since some of the secondment sites were unable to host the ESRs due to restrictions in travel and entrance to several states. The plan shown below is the contingency plan approved by the ESRs, the hosts, and the project officer.

Figure 7. Revised CBIM ESR secondment plan.

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3.5   Personal Career Development Plans

In CBIM, for each ESR, a **bespoke training programme** has been designed, taking account individual aspirations and competencies. A core element in developing this bespoke programme is the Personal Career Development Plan (in short, PCDP). While the CBIM training events take a top-bottom perspective and provide a general set of knowledge and skills deemed relevant in the area of the CBIM project, the PCDPs take a complementary bottom-up view. These plans were developed by each ESR with the support of their supervisor.

The development of the PCDPs encourages reflective thinking and planning not only to short term objectives (e.g., complete a literature review, get a PhD), but forces more strategic outcome-driven thinking. To prepare the PCDP, ESRs were asked to think about their medium-term plans ("*life after CBIM*") and priorities. ESRs tend to be quite enthusiastic and may engage with side activities that might reduce value; having a clear goal helps maintain focus and possibly identify a direction of development and concrete steps in this regard.

The PCDP, through the reflective approach it supports, is a useful tool for defining and identifying both short- and medium-term development activities. Moreover, the process of developing the PCDP, supports a structured discussion between the supervisor and the ESR. This helps development of S.M.A.R.T. objectives. From a project management perspective this reduces risks and helps build rapport between supervisors and ESRs.

The PCDP is an instrument to support the development of the bespoke training programme of CBIM. In particular, it helps support identification of:

Local ESR-tailored training courses and technical training

Depending on the established research program, each ESR fellow will need specific theoretical and technical complementary training to meet the research objectives. The academic host or industrial partner recruiting the ESR will, in consultation with the fellow, devise a tailor-made program within the first few months after hiring the ESR that will be independently conducted by the host institution. Examples of such training needs may include the use of specific software such as Revit, R, EPSS, Python, as well as doctoral courses at the PhD hosting institution, or on the use of technical equipment.

Local complementary skills training

Each ESR will be encouraged to participate in complementary skills training offered at their host institutions. Examples of such programmes are project management courses, language courses (since the ESR will be seconded in other countries). Also, for academically oriented students, teaching training, as well as the ability to contribute lectures to locally taught modules (e.g., as Postgraduate Teaching Assistants).

Each ESR, shortly after they started within the network, were asked to complete the PCDP. After review, these PCDPs were collated in Deliverable 5.2. Delays in the start dates of some ESRs (due to the pandemic), have had knock-on effects in the preparation of the PCDPs, and concomitantly the submission of D5.2.

The ESRs are expected to revisit their PCDPs in Sept 2022 and revise them (in line with the template provided in D5.1) with a view to exploitation. More details can be found in Deliverable 5.2.

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3.6   Training Committee

Table 9. Members of the CBIM Training Committee.

Name	Position	Organization
Dr. Dimitrios Rovas	Training Committee Chair	UCL
Dr. Ajith Parlikad	Member	UCAM
Ms. Susana Martín	Industrial partner	CARTIF
Dr. Ilka May	Industrial partner	Loclab
Tawakalitu Odubiyi	ESR representative	TUB
Zijian Wang	ESR representative	Technion

4 Dissemination

In D6.2 a dissemination and communication plan was devised. In particular, in the first year we set up the following communication channels.

4.1 CBIM website

The public website https://www.cbim-etn.eu acts as a communication and dissemination channel for the project's results and for involving and enlarging the stakeholder community. In addition, it serves as the main interface towards organisations and people outside the CBIM project consortium who are interested in the work and achievements of the project.

Figure 8. CBIM website landing page.

4.2 CBIM Blog

Figure 9. CBIM blog.

4.3   CBIM LinkedIn

A dedicated CBIM LinkedIn group was established to distribute project news that can be reposted by the personal accounts of the CBIM project team members. As of writing this report, the LinkedIn group had 131 members.
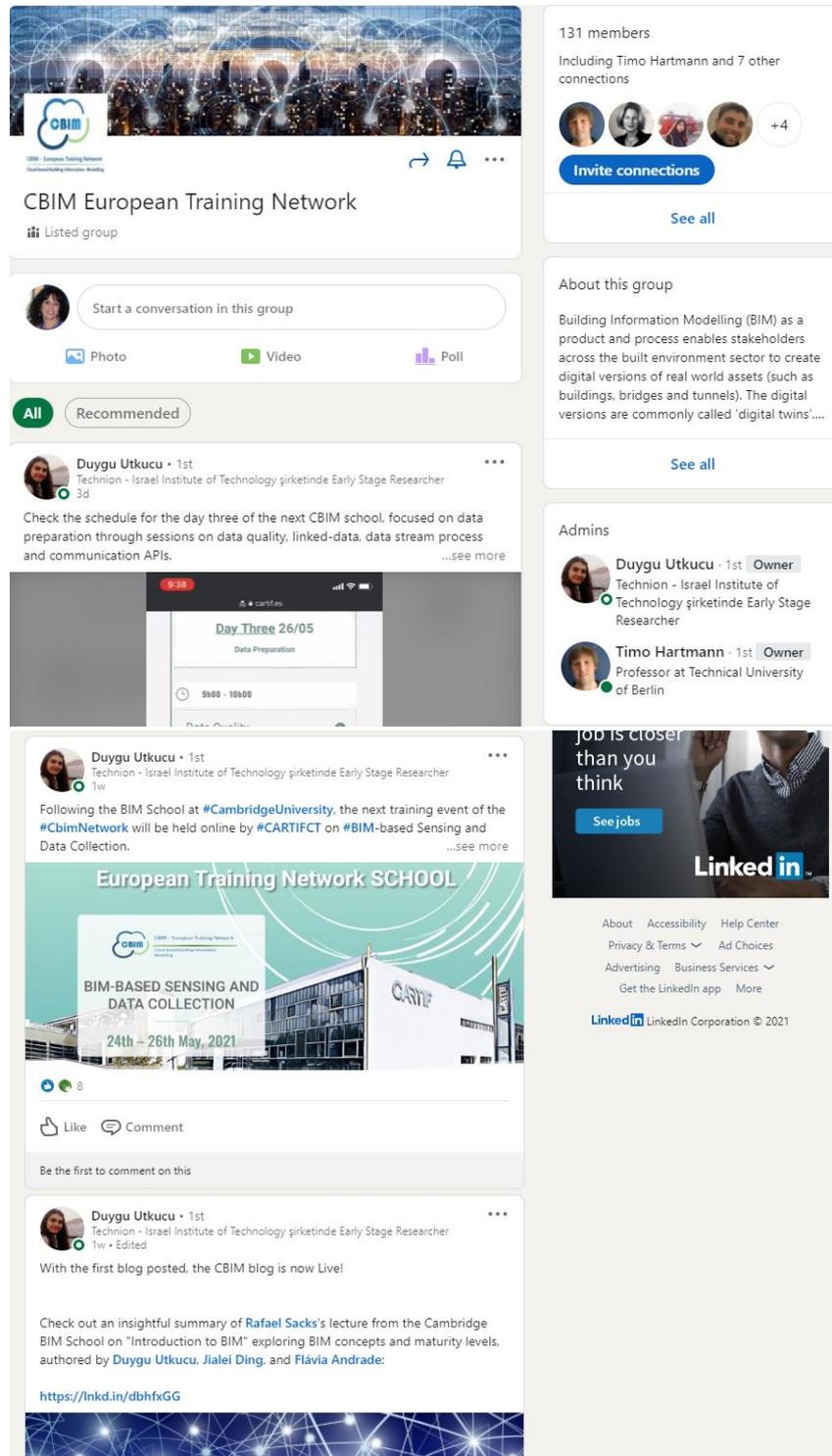
Figure 10. Images from the CBIM LinkedIn group account.

4.4 CBIM Twitter

A Twitter account has been established in order to reach a wider exposure.

Figure 11. CBIM Twitter account page.

In addition to the communication channels, the first dissemination material has been developed. This includes an interview with the project coordinator and an infographic about the goals of the CBIM project.

Figure 12. CBIM online content – interview with the coordinator.

4.5   Outreach Committee

Table 10. Members of the CBIM Outreach Committee.

Name	Position	Organization
Prof. Timo Hartmann	Outreach Committee Chair	TUB
Dr. Eleni Papadonikolaki	Member	UCL
Mr. Kim Nyberg	Industrial partner	Trimble
Dr. James O'Donnell	Member	UCD
Duygu Utkucu	ESR representative	Technion
Victor Drobnyi	ESR representative	UCAM
Flavia De Andrade Pereira	ESR representative	CARTIF
Jialei Ding	ESR representative	Loclab
Zhiqi Hu	ESR representative	UCAM
Nihan Diren	ESR representative	TUB
Janet Chang	ESR representative	UCAM
Lilach Livne	Marketing Communication	Technion

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5   Organizational Structure
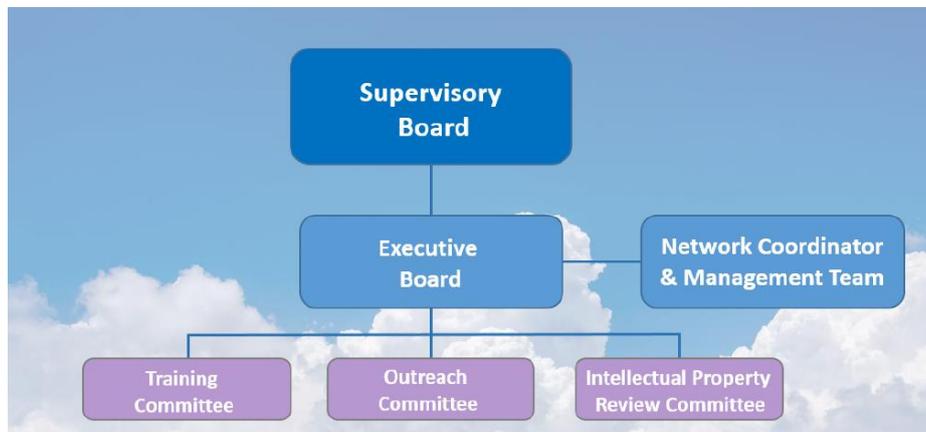
Figure 13. CBIM organisational structure.

5.1   Executive Board

Table 11. Members of the CBIM Executive Board.

Name	Position	Organization
Prof. Rafael Sacks	Coordinator	TRDF (Technion)
Dr. Ioannis Brilakis	Deputy Coordinator	UCAM
Ms. Anat Avital	Administrative Coordinator	TRDF (Technion)
Dr. James O'Donnell		UCD
Dr. Dimitrios Rovas	Training Coordinator	UCL
Dr. Ilka May	Recruitment & Equal Opportunities Coordinator	LocLab
Prof. Timo Hartmann	Communications and Outreach Coordinator	TUB
Ms. Susana Martín	Science and Relations with Industry Coordinator	CARTIF

5.2   Coordinator and Management Team

Figure 14. Members of the CBIM management team at Technion (TRDF).

5.3 Kick-Off Meeting

The CBIM Kick-off meeting was held on Monday, 20th July 2020, via Zoom.

More than 30 Participants attended the meeting, among them beneficiaries, partners, academic supervisors, ESRs and advisory board members. The Schedule included presentations on project overview & research and training goals – by Rafael Sacks; Management structure and team – by Anat Avital; short introductions of beneficiaries, partners, academic supervisors, advisory board members and all of the ESRs.

Presentations were given about training activities by Dimitrios Rovas; dissemination by Timo Hartman, and Ioannis Brilakis provided an introduction about TE1 in Cambridge, which was planned for December 2020.

Later, the group split into two Zoom 'rooms':

Room 1: **ESRs meeting**. The following topics were discussed: roles of beneficiaries and of the partners; expectations from ESRs; Q&A; assignment of ESR representatives to CBIM committees. The session was led by Rafael Sacks, Dimitrios Rovas and Ilka May.

Room 2: **Beneficiaries & Partners meeting**. The following topics were discussed: role of beneficiaries and partners: information and collaboration; secondments: why, whom, when and where, set up supervisor-partner meetings. This session was led by Ioannis Brilakis.
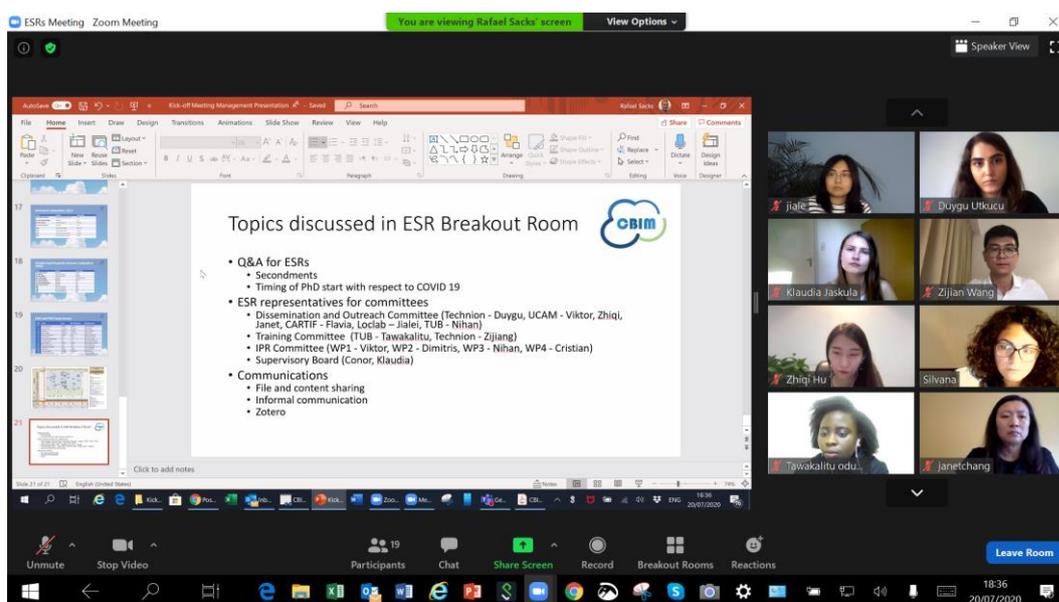
Figure 15. Zoom screen capture from the ESR session at the Kick-Off meeting.

5.4 Supervisory board meeting

The first annual meeting of CBIM's supervisory board was held via Zoom on 2nd March 2021. After a short round of introductions, updates were given by the coordinator - Rafael Sacks; the administrator - Anat Avital; the chair of the training committee - Dimitrios Rovas; the chair of the dissemination committee - Timo Hartman and the chair of the IPR Committee - Susana Martín Toral.

A short review was presented on the TE1 - BIM PhD School at Cambridge by Ioannis Brilakis; MOD1-Product Modelling & Management at TUB by Timo Hartman and Susana Martín Toral presented the plans for TE2–Sensing & Data Collections to be held during May 2021 at CARTIF.

19 of the 24 members of the board participated in the meeting.

Table 12. Members of the CBIM Supervisory Board.

Name	Position	Organization
Prof. Rafael Sacks	EB member	TRDF (Technion)
Dr. Ioannis Brilakis	EB member	UCAM
Mrs. Anat Avital	EB member	TRDF (Technion)
Dr. James O'Donnell	EB member	UCD
Dr. Dimitrios Rovas	EB member	UCL
Dr. Ilka May	EB member	LocLab
Prof. Timo Hartmann	EB member	TUB
Ms. Susana Martín	EB member	CARTIF
Mr. Kim Nyberg	Beneficiary representative	Trimble
Dr. Thomas Liebich	Partner representative	AEC3 Deutschland
Prof. Leonidas J. Guibas	Partner representative	Stanford University
Ms. Katja Günther	Partner representative	Deutsche Bahn
Dr. Mark Bew	Partner representative	PCSG
Mr. Frank Lehmann	Partner representative	DLR
Mr. Paul Brennan	Partner representative	BAM
Mr. David Robertson	Partner representative	Bentley
Mr. Frank Walter	Partner representative	Arcadis
Mr. Adam Locke	Partner representative	Laing O'Rourke
Dr. Lucien Ungureanu	Partner representative	Contecht
Conor Show	ESR Representative	UCD
Klaudia Jaskula	ESR Representative	UCL
Prof. Andre Borrmann	External academia representative	TUM
Dr. Frank Weiss	External industry representative	Oracle
Dr. Bhargav Dave	External industry representative	Visilean

Figure 16. Zoom screen capture from the supervisory board annual meeting in March 2021.

6   Summary

At the end of its first year, the CBIM consortium has achieved its setup objectives, its training activities are well under way, and it is poised to begin delivering on its research promise – development of the principles the next generation of Building Information Modelling systems in the cloud.

The project has recruited fourteen excellent early-stage researchers and they have all taken up their positions with their beneficiaries. They have all been accepted to and begun their PhD studies. This status was achieved despite the withdrawal of one ESR close to their start date and despite the numerous restrictions on travel imposed by governments in response to the coronavirus pandemic. Of the 14 ESRs, eight started on time as planned, and six were delayed from one to two months beyond the originally planned dates. This and other considerations related to the pandemic have required us to prepare an updated plan for secondments, which includes contingency plans.

The training event at UCAM in December 2020 was moved online, but nevertheless held as scheduled, with our own 14 ESRs and with 25 additional students. The first remote training module was completed by TUB, and planning is well under way for the second training event, to be run by CARTIF. All ESRs have prepared personal career development plans with the support of their academic supervisors and beneficiary hosts.

Communication and dissemination platforms have been established with multiple active channels, and we are confident that these are ready to begin publicizing the consortium's activities and its future research achievements. Meetings of the supervisory board, the beneficiaries, and the partners, and the ESR group have all been held as planned, albeit online rather than in person.

The management team is all in place, having been rounded out with the addition of a part-time marketing and communication administrator in December 2020. The various deliverables of the project have been delivered on time, with the exception of two deliverables, one related to Data Protection Officers and the other to Dual-Use of equipment, both of which will be submitted within the coming days.

In summary, the consortium appears to be functioning well. One significant positive sign is that the ESRs are coalescing as a group and building a group identity, and this even though they have not yet met one another face to face. We believe that this bodes well for the consortium to achieve the synergy needed to achieve impact as a group in the research and development of Cloud BIM.