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The international building challenge: a unique example of collaboration between European universities

The built environment is diverse in Europe. The establishment of a research group on "innovative real estate management" in 2010 marked the start of development of study programmes on the built environment at several universities in the Netherlands. The idea was to draft a game programme for students to compete for developing the best real estate design. Soon IBC became an international student exchange programme, allowing multidisciplinary student groups from different European cities to make the best propositions for a real estate case.

In the years to follow, more international participants joined the programme to add diversity and multidisciplinary to the IBC project. It is a serious cross-cultural undertaking in which different experiences, approaches, visions, creativity, innovativeness, languages and personal skills interact for a very short period of time.

These requirements illustrate the complexity of the task that needs high professionalism, cross-cultural and cross-functional approaches to achieve the best results in a dynamically changing real estate industry facing new challenges and longing for new education strategies. Despite the COVID-19 travel restrictions, students are still provided with a broad selection of interesting practical cases and an opportunity to cooperate with their foreign colleagues online.

Today the following respected education institutions participate in the IBC project: University of Applied Sciences Saxion (Netherlands), RANEPa (Russia), MGSU (Russia), Moscow Architectural Institute (Russia), Vives University College (Belgium), University of Duisburg (Germany), Westminster University (England).

Keywords: *International Building Challenge, innovative project, student exchange programme, redesign, development, cross-functionality*

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INTRODUCTION

The world of the built environment is dissimilar and diverse in Europe. For example, the Netherlands faces big challenges and it needs to enhance the sustainability of the housing stock and combat the long-term vacancy of commercial buildings. These are the major assignments for the Dutch building industry to do over the next decades.

In 2010, a research group on "innovative real estate management" was established; this group initiated the development of study programmes on built environments at several Dutch universities. It was a search for high-quality educational resources that would capture the attention of students [1]. One of the ideas was to design a game programme in which students would have to compete for making the best building design proposition. The idea of a competition between student groups in a well-structured environment was welcomed with enthusiasm.

THE HISTORY OF IBC

In 2015, Glenn Stern of the Dutch Saxion University of Applied Sciences took the initiative to design an international student exchange programme in which international, multidisciplinary student groups would compete to make the best proposition for a real estate case in different cities in Europe. Stern was a member of the earlier mentioned faculty. That year, we had our first contact with Moscow universities and in 2016 the first international case in which Moscow students from RANEPa, MGSU, B&D and

Saxion battled for the best redesign of the Mysovo Manor in Dolgoprudny, Moscow region.

In the years to follow more international participants joined the project to make IBC more diverse and multidisciplinary. Enschede (the Netherlands), Oostende (Belgium), Berlin (Germany), London (England) and, of course, Moscow launched their projects on different study cases within the IBC concept, and the whole programme gained popularity as the time progressed.

IBC 2016, MAY 1–10. MYSOVO MANOR, DOLGOPRUDNY REDESIGN DEVELOPMENT.

The workshop was organized by the National Association of Fachwerk Architecture Researchers (NOIFA), the Russian Academy of National Economy and Public Administration (RANEPa) and the University of Applied Sciences "Saxion" (the Netherlands). The event was hosted by the Institute of Business and Design, the Moscow State University of Civil Engineering, the National Institute of Design and the Dolgoprudny History and Art Museum. The project partners were Neso Nuffic Russia, the Moscow Institute of Architecture (State Academy), the National Institute of Modern Design, the Naukograd Development Union of Russia, the Dutch-Russian International Centre, the Mega-design faculty of Technology College 21, Keim company, Regional Resources and NLK Domostroenie. The total number of participants, including students, tutor experts and jury members, exceeded fifty people [2].

The assignment was to renovate a municipality-owned yard building and the surrounding part of the

▶ territory of the Kuznetsov estate (Mysovo, Moscow region, Russia). The building dates back to the early twentieth century; it features the Tudor-Elizabethan style, and it used to have a fachwerk first floor. It is a monument of history and architectural heritage of regional significance.

Within the framework of the project, conditions of interaction between developers, engineers, architects, designers and customers were simulated for the first time [3]. At the same time, the workshop was a unique venue for a dialogue between representatives of different design, educational, and technical communities supported by the leading specialized universities in the Russian capital. In addition, participants surveyed and measured the buildings of the Kuznetsov estate and visited the Dolgoprudny Historical and Art Museum (Fig. 1) to get better insight into the socio-cultural context of the studied area.

Students benefited from lectures on unique architectural and town-planning features of the estate, the history and evolution of the fachwerk technique in the context of the architectural practice, the use of silicate paints in the restoration of fachwerk buildings, innovative wood use in the frame pavilions in Moscow parks, local trends and their alteration in contemporary Russia [4].

Final redevelopment presentations shortlisted three winners in the following nominations: "The best development solution", "The best architectural and design solution" and "The best engineering and construction solution".

IBC 2017, MAY 2-12. REDESIGN OF TREKHGORNAYA MANUFACTORY PAVILION NO. 24, MOSCOW

The project session assignment was to solve integrated architectural, engineering, construction, design and development tasks

for the benefit of a historical building, meeting BREEAM international environmental requirements [5].

Rozhdestvenka architectural bureau was an IBC 2018 special partner and customer. The partners of the workshop were Trekhgornaya Manufactory, "Neso Nuffic Russia", GBU "Mosstroyinform", Moscow State "Stanislavsky Electrotheater", Vinzavod Contemporary Art Center, "EligoVision" company, the developer of interactive technologies.

Among the participants were graduate students and undergraduates of Saxion University of Applied Sciences (The Netherlands), IIM RANEPa (Moscow), B&D Institute (Moscow), Moscow Institute of Architecture (MARHI), Moscow State University of Civil Engineering (MGSU). The total number of participants, including experts and jury members, exceeded 80 people (Fig. 2).

The workshop had several parts: research, "a creative workshop", a tour of the building given by project experts, discussion and presentation [6]. Tutors (group leaders), specialists in architecture, design, development, engineering equipment, ecology and landscape supported teams throughout the whole IBC workshop. Final team presentations proved that IBC 2018 had successfully set new academic cross-functional standards in the real estate and building industry training.

In 2018, the IBC project developed into a more integrated module within the curriculum of several European universities (Fig. 3). The number of participating students was rising and the event was gaining interest from other universities in Europe; the universities of Westminster and Duisburg/Essen joined the IBC project.

More often than not, facilities, selected for redevelopment, were local cultural heritage buildings, for example, the Patrikeev estate (White Pillars) built in 1907 by architect Shekhtel and considered one of his masterpieces. The assignment was to breathe new life



Fig. 1. The IBC 2016 impressions. Photos by Glenn Stern



Fig. 2. Impression of the Moscow case, 2017. Photos by Glenn Stern



Fig. 3. A student group working on the Enschede case in 2018. Photo by Glenn Stern

into the estate and the picturesque adjacent territory, while preserving numerous historical and architectural items, as well as the famous Art Nouveau style of the famous architect. At the development stage, the teams identified socially significant concepts of using an estate building, adjacent buildings and the park, for example: an educational centre for schoolchildren, an art residence for painters and sculptors with exhibition areas, a centre for spiritual development, a fantasy club for active and cognitive leisure, as well as a coworking space with an art gallery and a museum of the history of Khimki, etc.

Due to the COVID 19 pandemic, it was impossible to organize a live version of the IBC event in 2020, although the preparations for the challenge were underway. Against the background of the universities struggling to maintain their regular programmes in the online format, unfortunately, IBC 2020 was cancelled. Although deprived of the opportunity to travel to the case project site due to the COVID-19 restrictions, IBC 2021 still took place in a new interesting online format. Table 1 below sums up IBC study cases for the period from 2016 to 2019.

INTERNATIONAL BUILDING CHALLENGE 2021, MAY 10–21

Despite the global pandemic, IBC 2021 project enabled international student teams to meet again for this truly challenging task of preparing their redevelopment cases exclusively in the online format (Fig. 4, Table 2). As usual, all groups had their university lecturers as tutors to coordinate the group progress. The students had an extra challenge of working together as complete strangers. As usual, undergraduate and graduate students from development, architecture, urban planning faculties took part in the project.

The mechanism of project implementation did not change significantly: students from participating universities could independently choose any of the cases announced by the organizers from any partner university and join any of the international teams to conduct collective work on the project development using the source materials. During the 10-day project session, international teams participated in master classes, trainings, listened to online lectures, delivered by teachers from participating universities and studied modern trends. As usual, the result of the project session was a competitive presentation of projects developed for each case. Fluent English was a must same as in the previous years.

All participants received memorable certificates, and the winners received diplomas from the host party.

Participation in the project enabled universities, for instance, MGSU, to develop a short-term practice-oriented study programme for students from foreign universities. This programme can be used annually for a similar international practice of foreign students, as well as summer schools, and attract foreign students to enroll in Master's degree programmes.

The MGSU workshop "The concept of spatial development of suburban creative cluster "Melnica Space ExUrban Hub" in Tula region" (Fig. 5) was among the most interesting and challenging. ANO Center for the Development of territories "GorodZagorod" acted as a project partner.

Table 1. Summarized IBC study cases in 2016–2019

Year 2016	
Moscow	Mysovo Manor
Enschede	Polaroid Building
Year 2017	The number and type of pests
Moscow	Trekhgornaya Manufactory (a factory)
Enschede	Polaroid Building
Berlin	A new building in the existing environment
Dusseldorf	Integrating a historical building into a new environment
Year 2018	
Moscow	Redevelopment of the territory of the State Memorial Estate of P.I. Tchaikovsky
Enschede	Robson Factory. Redesign.
Friedrichsdorf	Hospital Transformation
Wurzburg	Transformation of an airplane shed
Year 2019	
Moscow	Renovation of the Patrikeev estate ("White Pillars")
Enschede	Redesign of an established neighbourhood
Oostende	Expansion of the existing Vives University building
London	Design of a sub-plan for the Elephant Park project
Eschweiler	Redesigning environment around the City Hall
Berlin	New building, inner city location



Fig. 4. Participating Universities/Organizations 2021 (source: Glenn Stern)

The project assignment was to integrate “Melnica Space” into the natural environment, including local villages, cottage settlements, the district centre, industrial and market zones, roads. The design of the transport network and infrastructure for pedestrians and cyclists, as well as electric vehicles was needed. “Melnica Space” should have become a point of attraction for young active locals from Zaoksky district, Tula and nearby mid-sized towns. To create and nurture a production centre for grassroot initiatives based on the values of the creative sharing economy was also among other assignments of the project. Participating teams had to formulate a unique culture and social code for “Oka” micro-region and develop business ideas for the three largest cities (maybe more) to bring investments to develop Oka with “Melnica Space” as the heart of the community.

Partner universities organized and delivered relevant lectures to all participants of the project session on:

Sustainability: climate control, energy management; ventilation in the days of Corona;

Computer Software: energy calculations to conform to current building regulations; anticipated ideas of contemporary architecture in the Russian avant-garde.

All teams demonstrated high motivation, willingness to search for non-standard solutions, professionalism and readiness to solve urban planning problems using modern construction technologies.

The idea of the workshop and the workshop itself allowed student participants to benefit in three different ways.

First of all, it is a possibility for students to increase their international exposure by participating in a project rather than a travel

activity. The work on a foreign case gives students a chance to better understand the industry approaches in other countries and improve their expertise that they can contribute to other best practice cases in the future. A multi-cultural team experience gives them a chance to build up effective communications within a diverse group, learn new communication techniques and broaden their soft skills.

Second, the teams are multi-professional, and the setting imitates a project environment, since all participants have developers, architects, designers, construction engineers and other related professionals on board. During the workshop participants can better understand how different professionals communicate, what goals they pursue, and guess the project value.

Moreover, project participants have an opportunity to attend lectures given by tutors from different universities and professions. So, they learn through seminars and lectures as well as in the course of practical work.

In the beginning, team work looks like a bundle of people talking different languages and living in different culture codes, while by the end of the workshop, they often become a team understanding each other's values and problems, helping to achieve better results altogether.

At the final workshop, that happened to be online, RANEPА presented a case on a local community centre suggested by one of the MBA students. The opportunity to involve different levels of education in a proper way might also improve the results of the workshop. The international exposure is very important for students in the context of the pandemic and its consequences, as well as some political complications that bring back fences and impose limitations. Of course, the online format does not allow to feel the case, see the project with one's own eyes and work at one table. At the same time, this format might enable more students from different countries to participate and bring in more interesting cases in diverse locations.

WHAT IS AN INTERNATIONAL BUILDING CHALLENGE CONCEPT TODAY?

The mission of the “International Building Challenge” is to enable students majoring in various areas of knowledge — architects, engineers, economists, developers, sociologists and others — to interact efficiently as one team pursuing a common goal while tackling the problem from different angles using the professional expertise and competences.

The International Building Challenge is a programme that represents a two-week local real estate project for students from several European universities. The first week is intended for the preparation of the case with all the necessary data being provided by the organizers, hosts or customers. Numerous online lectures on the case related topics, creativity workshops, master classes and panel discussions could be launched at this stage to help students get the right mind-set and deepen their understanding of the important issues to be solved. During the second week students travel to their case destination to join project groups and meet local students, or start online team work preparing the final case presentations. At the end of the second week project teams present their final proposals to a professional jury of industry experts and tutors.

Usually, all IBC cases require cross-functional student competences in such fields as construction, financial management and accounting, architectural design, construction engineering, urban design, and others. Still, all assignments located in different cities,

Table 2. IBC 2021 welcomed the following participating universities

University	Study case
1. Vives University Oostende Belgium	Transformation of a historic building near the harbour of Oostende
2. Moscow State University of Civil Engineering, Moscow, Russia	Design of the ExUrban Hub in Zaoksky district, Moscow
3. RANEPА, Moscow, Russia	
4. Westminster University, London, England	Designing a Visitors Centre in Hyde Park, London
5. Saxion University of Applied Science, Enschede, the Netherlands	Transformation of an old Gymnasium school in Deventer

MELNIKA PARK. 3D proection

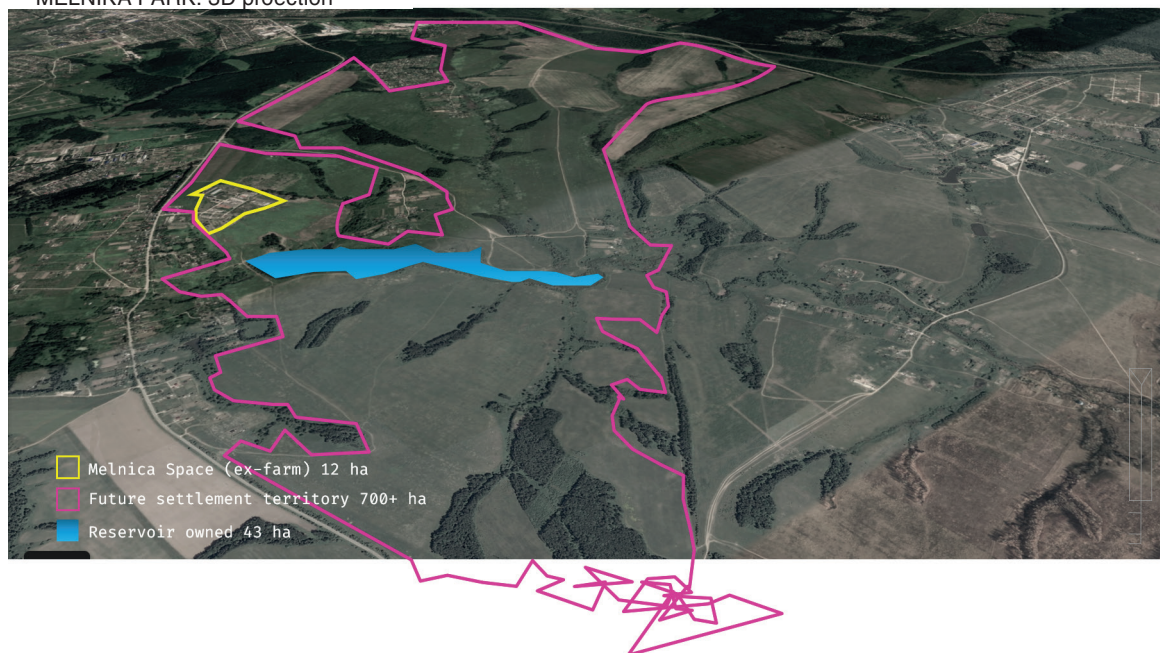


Fig. 5. The map of Melnica Space ExUrban Hub (Tula region)

feature specific demands and circumstances. For instance, the De-venter case 2021 (the Netherlands) presentations were assessed by the following criteria:

- architecture: the aesthetic quality of design;
- financial feasibility: the first draft of an investments budget;
- total cost of ownership for the 20-year period;
- structural feasibility analysis in terms of the proposed changes and choices;
- functional quality: qualitative judgement on solutions suggested to implement the client's functional requirements;
- description of the renovation process;
- proof of energy neutral design of buildings;
- an urban plan for the entire site.

This list illustrates the complexity of the task, requiring high professionalism, cross-cultural and cross-functional approaches to guarantee better results in a dynamically changing real estate industry facing new challenges and requiring new educational strategies.

Therefore, nowadays International Building Challenge is a serious project setting new educational standards, marrying different cultures, expertise, approaches, visions, creativity, innovativeness and other personal skills, creating something unique in a very short period of time.

It is considered by all participants to be a great way of bringing institutes and industry together and making use of fresh and

diverse points of view coming from international student teams. One of the participants expressed his emotions in the following way: "The International Building Challenge" is my best experience gain from the whole academic course!"

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International building challenge: уникальный пример сотрудничества европейских университетов

Рынок недвижимости в Европе демонстрирует удивительное разнообразие. Создание исследовательской группы по инновационному управлению недвижимостью в 2010 г. ста-

ло началом разработки инновационной образовательной программы по недвижимости в нескольких университетах Нидерландов. Идея состояла в том, чтобы создать программу для студентов, которые будут проводить защиту лучшего кейса redevelopment объекта недвижимости. Вскоре инициатива International Building Challenge (IBC) стала международной университетской программой академического обмена, позво-

ляющей многопрофильным студенческим командам из разных уголков Европы бороться за признание своего проекта лучшим проектом реновации в сфере недвижимости. С годами рост числа международных участников придал ИВС проекту все более разнообразный, креативный и междисциплинарный характер. Сегодня это — серьезный образовательный инновационный проект, в рамках которого в сжатые сроки приходят в соприкосновение и взаимодействуют различные культурные коды, исследовательские подходы и профессиональные навыки участников.

Задачи, решаемые в ходе проектных сессий, требуют высокого профессионализма, кросс-культурного и кросс-функционального подхода, в целях достижения наилучших результатов в динамично меняющейся индустрии недвижимости, сталкивающейся с новыми вызовами и требующей новых образовательных стратегий. Несмотря на ограничения на поездки из-за COVID-19, студентам по-прежнему предоставляется широкий выбор интересных практических кейсов и возможность сотрудничества со своими иностранными коллегами в режиме онлайн. На сегодняшний день среди участников ИВС такие уважаемые учебные учреждения, как Университет прикладных наук Саксион (Нидерланды), РАНХиГС (Россия), МГСУ (Россия), МАРХИ (Россия), Университетский колледж Vives (Бельгия), Университет Дуйсбурга (Германия), Вестминстерский Университет (Англия).

Ключевые слова: *International Building Challenge*, инновационный проект, университетская программа академического обмена, редевелопмент, кросс-функциональность

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