SybPhys: Development of practically-oriented student-centred education in the field of modelling of Cyber-Physical Systems

PROJECT NUMBER: 609557-EPP-1-2019-1-LV-EPPKA2-CBHE-JP

Dissemination and Exploitation Plan

Workpackage No.:	**6**	Workpackage Title:	**Dissemination and Exploitation**
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Executive Summary

A well designed and implemented dissemination and exploitation plan is imperative to ensure that the project initiatives and outcomes are promoted and generate the required impact. Both the short-term and long-term outcomes of the project such as the educational initiatives undertaken and the newly generated knowledge, the social and pedagogical implications, , strengthening the academia – industry network are important for delivering high quality education, new training programs for the targeted stakeholders, the development of ICT-based teaching, and preparing Belarusian and Ukrainian students to compete in the declared field. Consequently, the dissemination and exploitation activities need to be further highlighted in a project Dissemination and Exploitation plan.

This document, which is entitled “Dissemination and Exploitation Plan”, is designed to report the current and planned dissemination and exploitation activities within SybPhys Project. This document has been structured to provide a general description of the dissemination and exploitation plan, a description of the project’s anticipated outcomes, a list of the participating organizations, and other-related dissemination and exploitations tools that will be utilized to raise awareness about the project and its broader pedagogical and social impact for Belarusian and Ukrainian students and the participating academic and non-academic institutions. The dissemination and exploitation plan also offers a synoptic view on the actions already undertaken and future actions that will be undertaken to complete the project implementation and to promote further the project and its outcomes.

Contents

Introduction

This document presents the Dissemination and Exploitation Plan of the SybPhys project, which is devised when the project starting and will be revised throughout the duration of the project. The document will be used as a point of reference and a guide for the dissemination and exploitation activities undertaken by the consortium partners in order to promote the project goals and tasks, its outcomes, and ensure that quality results were delivered in time. This document is imperative in order to ensure that all actions are realized in a timely manner and the quality of the tasks are met according to the high standards set by the project coordinator and participating partners. This document is guided by the Dissemination and exploitation strategy developed in the G.2 part of the project.

The overall objectives of WP6 (Dissemination and Exploitation) are summarized as follows:

- To increase public awareness about CybPhys and its impact
- To motivate students and professionals to follow CybPhys offered courses and education programs
- To ensure sustainability of the project outcomes beyond the project
- The target groups: students, engineers, researchers, academic staff and students from other universities who are not involved in the project, professional associations and the companies that operate in the field of CPS, governmental agencies, national education accreditation agencies
- A Dissemination and exploitation plan ws discussed and approved at the Kickoff meeting. The presented plan will be actualized in the project run. The progress and impact will be presented by the leader of WP6 at different MC meetings.

According to G.2 issue of the Project application Form, the Dissemination and Exploitation Plan is directed on the following Target Groups:

- **Academic and teaching staff** of Belarusian and Ukrainian universities involved in the project
- **Bachelor and master students** of participating PCs universities as future employees
- **Employers** (professional associations involved into CybPhys project as associated partners)
- **Graduates of the secondary and technical schools** as potential universities' entrants and their parents
- **HEIs of Belarus and Ukraine**, which do not directly participate in the project, as potential users of new developed courses, training programs, teaching/learning materials, e-learning system and Sharing Modelling and Simulation environment platform
- **Enterprises of high-tech industries and research institutions** that need specialists with the knowledge in the field of CPS modelling
- **Institutions of the Ministries of Education of Belarus and Ukraine**, which provide planning of specialists necessary for the industries, research institutions and other HEIs and accept new training programs (curricula).

To supply the approaching, the above mentioned goals and objectives as well as successful implementation of the project as a whole, in accordance with the the Dissemination and Exploitation Plan the partners should resolve the following tasks:

6.1. Development of information and promotional materials
6.2. Information sessions for target groups
6.3. Project Web Portal and social media
6.4. Recommendations for new training programs for the targeted stakeholders beyond the project
6.5. Strengthening the academia – industry network
6.6. Hosting and maintenance of e-Learning and SMSE platform beyond the project.
6.7. Strengthening cooperation beyond the project to sustain the outcomes.

The above general objectives as well as methodology of the dissemination and exploitation plan will be discussed in more detail below in the following subsection.

1. Objectives of the dissemination and exploitation plan

The dissemination and exploitation activities within the SybPhys project have the following specific objectives:

- Clearly define and ensure the successful realization of the project objectives, outcomes and tangible results, as defined in the project
- Identify and reach the target groups both at the local and national level, such as HEIs, students of different levels in academic faculties, professional associations, the Ministry of Education in Belarus and Ministry of Education and Science in Ukraine, as well as other associated partners
- Set up a strategy and propose specific actions to promote awareness about the project and its expected outcomes to organizations at a local, national, and European level
- Set up a strategy and propose actions for building a clear understanding of the pedagogical, institutional, and social implications of the project to Belarus and Ukraine and to the wider European community
- Set up a strategy and propose actions that will aim at engaging the Belarusian, Ukrainian and European community in the activities of the project
- Set up a strategy and propose actions that will ensure a high impact, dissemination and exploitation, and sustainability of the project and its expected outcomes.

2 Methodology of the dissemination and exploitation plan

The dissemination and exploitation plan is coordinated by the indicated associated partner, the Institute for Nuclear Problems of Belarusian State University, but all consortium partners and other associated partners are invited to actively contribute to the realization of all activities described in Dissemination and Exploitation Plan of the project. Multiple dissemination and exploitation activities are undertaken. Among these activities, the following are distinguished:

- Develop **a valorisation strategy** that includes **Dissemination and Exploitation Plan** (through the present document) and **a communication strategy** that will allow maximize project impact
- Identify **Key Stakeholders** in the field for targeted dissemination of project goals, objectives and outcomes
- Work with authorities and other HEIs, non-participating in the running project, to disseminate the project objectives and outcomes **at a national level**
- Stimulate **media interest and coverage** (local press, TV and radio broadcasts, social networking sites, etc.) to build the project's reputation: disseminate the project's goals, objectives and outcomes through 6 planned media publications and press releases, 6 TV and radio broadcasts, and 6 press conferences
- Design and display **posters at Belarusian and Ukrainian universities** where the equipment and software will be installed
- Design and produce **leaflets** for higher impact to promote the project objectives and outcomes among students and faculties at participating academic institutions
- Participate in **conferences and publish papers** in high impact journals
- Plan and Conduct **seminars for main stakeholders** (universities, NGOs, associated partners)

- Design **a project logo** for increase project visibility to promote the project goals, objectives and outcomes
- Plan and arrange **information sessions** to attract students and to inform stakeholders, authorities and other HEIs, non-participating in the running project: three sessions by each EU, Belarusian and Ukrainian university (3x9= 27)
- Disseminate and exploit the project activities and results **using virtual forums and other social networking sites,** such as Facebook and LinkedIn
- Disseminate the development of **innovative ICT-based teaching and learning environments** at a local and national level
- Develop, create and maintain an **accessible project website** as key valorisation tool
- **Develop and disseminate 9 e-books** for training bachelor- and master-level students in the field of CPS modeling to enhance project visibility
- Organize **a final conference** to disseminate the project results and organize their evaluation by stakeholders, education authorities and the industry representatives

In addition, further actions will be undertaken to elaborate and sign Double-sided agreements for cooperation between project partners during and beyond the completion of project. Consortium partners will agree that newly produced educational materials and tools will be freely accessible through the use of open licences. Elaboration of Study and Recommendation Documents for new training programs will also be introduced in order to ensure that practice-oriented, bachelor- and master-level programmes in Belarusian and Ukrainian universities will be in compliance with ECTS principles beyond the completion of the project. Based on Study and Recommendations, the preparation and adjustments of new bachelor- and master-level programs for the third year will continue to be tested beyond the end of the project.

3. Overview of SybPhys Aims and Objectives

The wide project goal is to upgrade bachelor/master-level curricula and study programs according to Bologna practices in Belarusian and Ukrainian universities in the area of Cyber-Physical Systems (CPS) modelling and simulation. These curricula are directed on innovative physical, mathematical and engineering sciences and High-Tech industry topics.

This goal will allow to introduce an interdisciplinary curricular in the field of practical-oriented modelling and simulation CPS for physical, mathematical and engineering topics for High-Tech industries, based on analysis of labor market needs, in close cooperation with NGOs, High-Tech companies and research institutions. The developed Sharing Modelling and Simulation Environment platform, which enables access to e-learning components, and novel ICT based tools will enhance new curricular implementation. The consortium members will strive to undertake actions that will enhance the quality and relevance of bachelor- and master-level education through the use of newly created study programs, focusing on the use of ICT, and networking activities that will help students meet the needs for the labour market.

The specific project objectives are directed on the further reformation of HEIs in Belarus and Ukraine according to the ET2020 strategy of European Union:

- To modernize the bachelor/master-level curricula and study programs for the Physical/Mathematical /Engineering Faculties in 6 universities of Belarus and Ukraine according to EU university's practices in

the area of innovative modelling and simulation of CPS for High-Tech industry and scientific research institutions;

- To enhance the quality of education in the area of modelling and simulation of CPS, based on the modernized bachelor/master-level training programs, focusing on the use of innovative ICT environment to realize the declared targets;
- To supply relevance of higher education in the area of modelling and simulation of CPS in Belarus and Ukraine to the main instruments and principles of Bologna process, and such European Higher Education Area (EHEA) documents as ISCED 2011, a Framework for Qualifications of the EHEA, ECTS, Standards for quality assurance in the EHEA, etc.;
- To develop/update lecture courses, virtual laboratory practices and teaching materials for bachelor/master-level training programmes in the area of modelling and simulation of CPS;
- To implement modern technical infrastructure with innovative ICT based teaching/learning environment for improvement teachers' qualifications and skills in the area of modelling and simulation of CPS;
- To improve teachers, academic staff and students' skills in practical English;
- To accredit and implement the new programs according to Bologna requirements, the labour market needs, and to increase employability of the graduates;
- To strengthen the collaboration between business and universities in PCs countries;
- To supply the labor market in Belarus and Ukraine by highly-educated bachelor/master level graduates in the engineering-oriented modelling and simulation of CPS topics directed on High-Tech industry and scientific research institution needs.

Cooperation between European, Belarusian and Ukrainian universities and industry will be imperative in order to define the particular industry needs and trends and ensure the industry's critical input in the development of training programs. The results of the project will promote further collaboration between Belarusian and Ukrainian HEIs, NGOs and business and will equip students with the required skills and knowledge to compete in the field od CPS modeling.

More specifically, acquisition of practice-oriented curricula and modules in the field of CPS modeling will be supported by virtual laboratories and dedicated hardware/software platforms.

4. Description of Dissemination and Exploitation Plan

This section gives a synopsis of the dissemination and exploitation activities undertaken and plans for future dissemination and exploitation activities. The dissemination and exploitation activities are adapted based on the project's needs to achieve the highest possible impact both at the national and European level. To facilitate the organisation and focus of the planned activities, they have been classified into four broad categories, capturing all stages of raising awareness. These categories are:

- **Building awareness:** This is the first set of actions that should be undertaken in all dissemination efforts, in order to make sure the project objectives and expected outcomes are known to interested educational and industry stakeholders and to Belarusian and Ukrainian societies in general.
- **Building understanding:** Further to awareness, the next general objective is to create real understanding of what the project is aiming to achieve. Again, this category of actions addresses not only the primary group of stakeholders, but also a broader group of interested stakeholders.

- **Achieving engagement:** The stakeholders of the project are expected to be involved in the whole process beyond understanding its objectives. This calls for actual engagement of interested stakeholders in both the education and industry sectors, either by participating in the reformation of Belarusian higher educational system according to the Bologna practices or by guiding consortium partners in identifying and meeting specific needs in the labour market in the field of CPS modelling.
- **Maximising impact and sustainability**: The ultimate objective of any project is to maximise the final impact to the academic faculties of partner universities, students of different levels, and academic communities and the Belarusian and Ukrainian societies in general. Therefore, throughout the duration of the project, activities should focus more on ensuring this impact and achieving sustainability of the results bejond the project implementation.

The following subsections analyse further the above categories of activities. The categorisation of the foreseen activities is not always clear in specific categories as many of them can be used to address more than one dimension of the dissemination and exploitation tasks. However, for simplicity, we list each activity only under one of the identified dimensions, usually the one in which the consortium believes the activity will impact more.

4.1. Building awareness

The following activities and tools have been categorised as main drivers for building awareness for the project goals, objectives and expected outcomes:

4.1.1. Internet Presence

4.1.1.1 Accessible and public project website

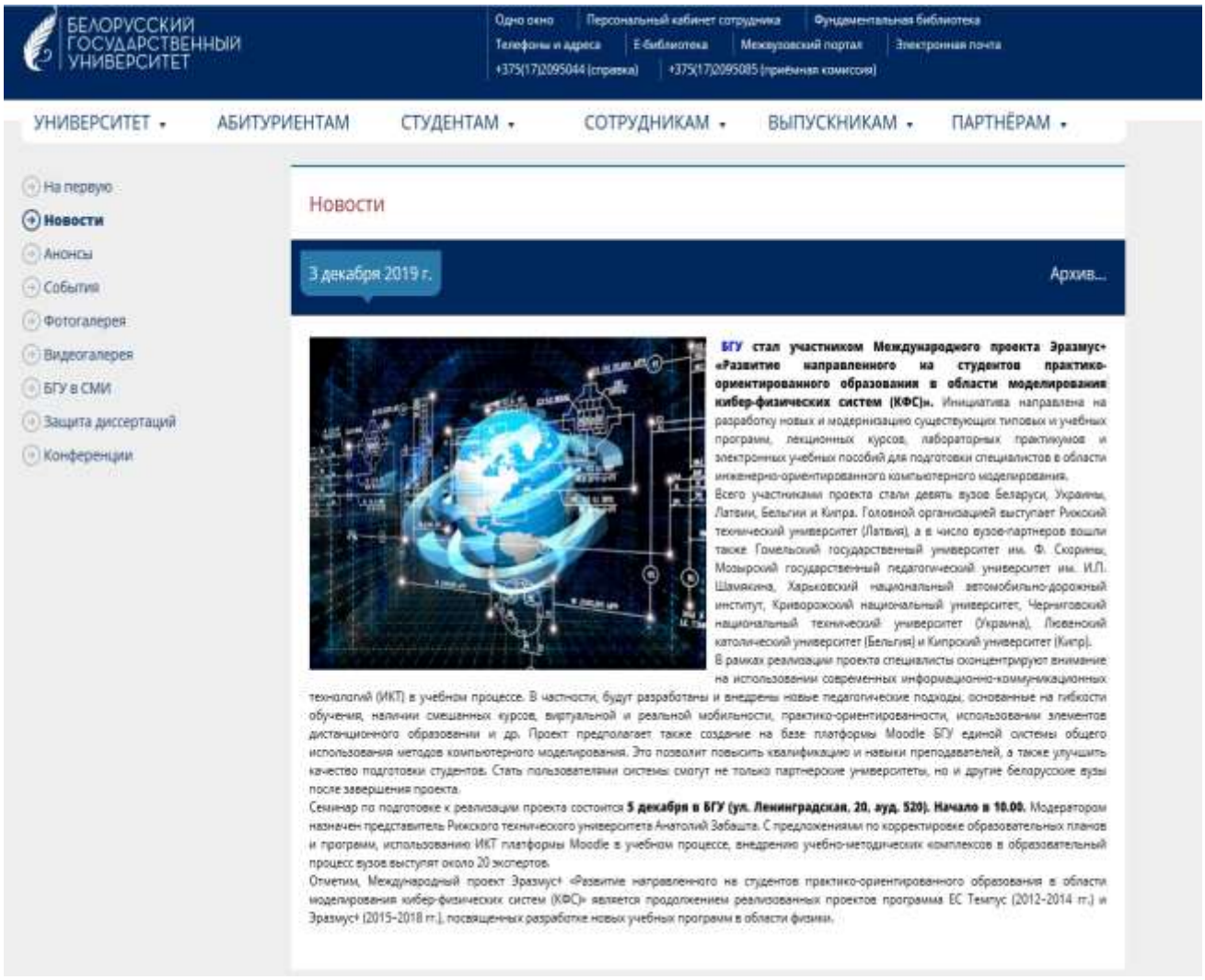
The internet presence of SybPhys project is primarily realized through the project's website: http://physics.rtu.lv/ and on the Moodle platform of Belarusian State University (https://eduphys.bsu.by/login/index.php). They are main dissemination tools that provide important information related to the project. Consequently, the website http://physics.rtu.lv/ needs to follow the project's evolution and it is updated constantly with all newly available information and outcomes. Moreover, it will provide important background information on the project, objectives, accomplishments, news, and the partners' roles and description. The developed e-books, curricula and study programs, a description of the SMSE platform and project documentation will be uploaded on the educational portal of the Faculty of Physics of BSU https://eduphys.bsu.by/mod/folder/view.php?id=2299 . The platform will be updated constantly with all newly available information and outcomes following the project running and evolution.

The website http://physics.rtu.lv/ will be developed, maintained and hosted by Riga Technical University. However, all consortium partners will be contributing to the content of the website during the implementation of the project. The screenshots below present a few of the public access pages of the SybPhys project website.

The SybPhys publicly accessible website conveys general information about the project and enables visitors to understand its potential outcome. The following elements can be found on the website:

- General information about the SybPhys project (including texts of application forms, etc.);
- News about the progress of the project, including press releases, workshops and managing meetings minutes, descriptions of student training sessions, sessions for stakeholders, etc. ;
- A summary of the SybPhys project;

- Important background information on the project;
- Important documentation on the project, such as a demo on the e-environment used in the project;
- Partner profiles and their contribution to the project;
- Contact information



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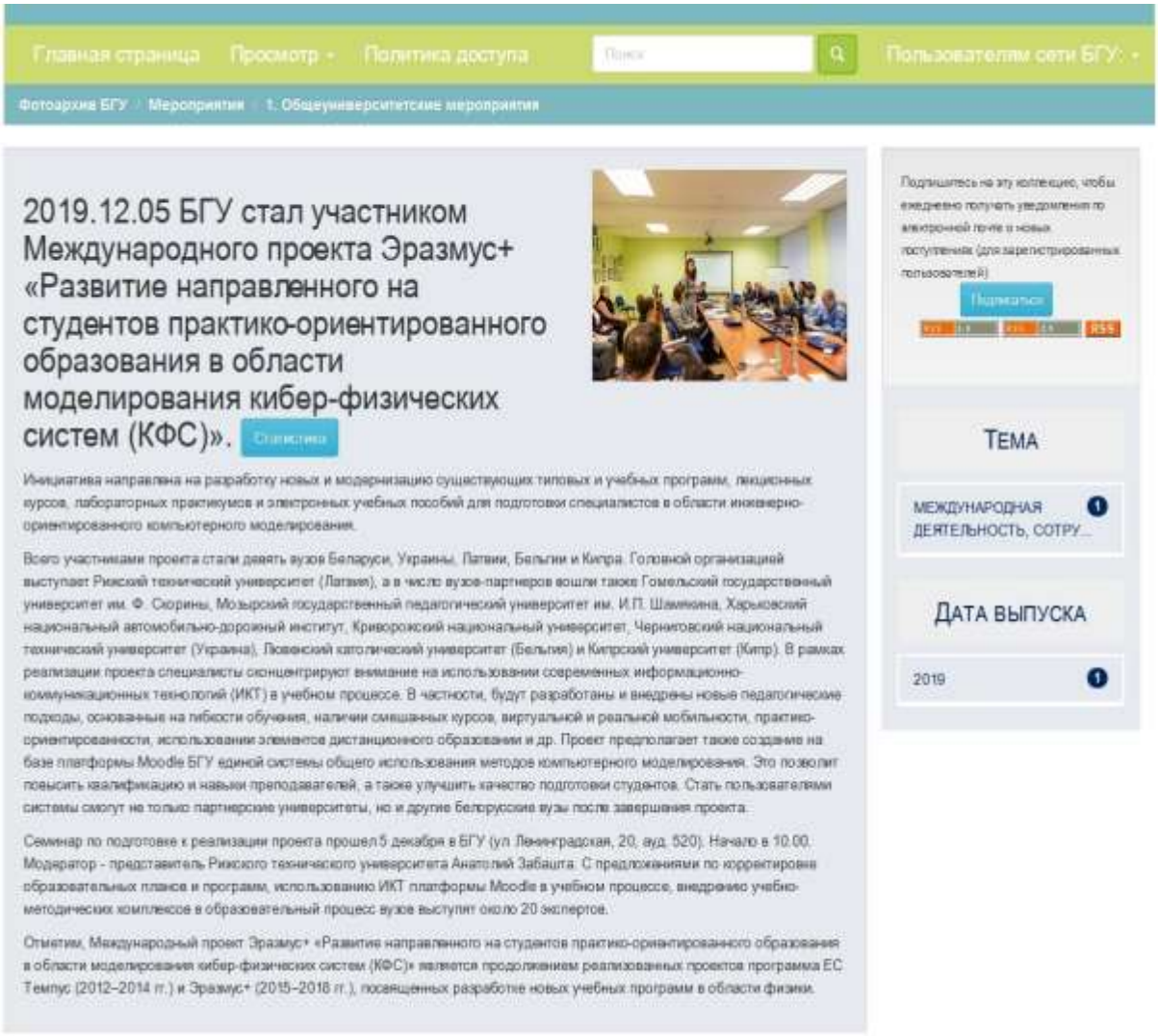

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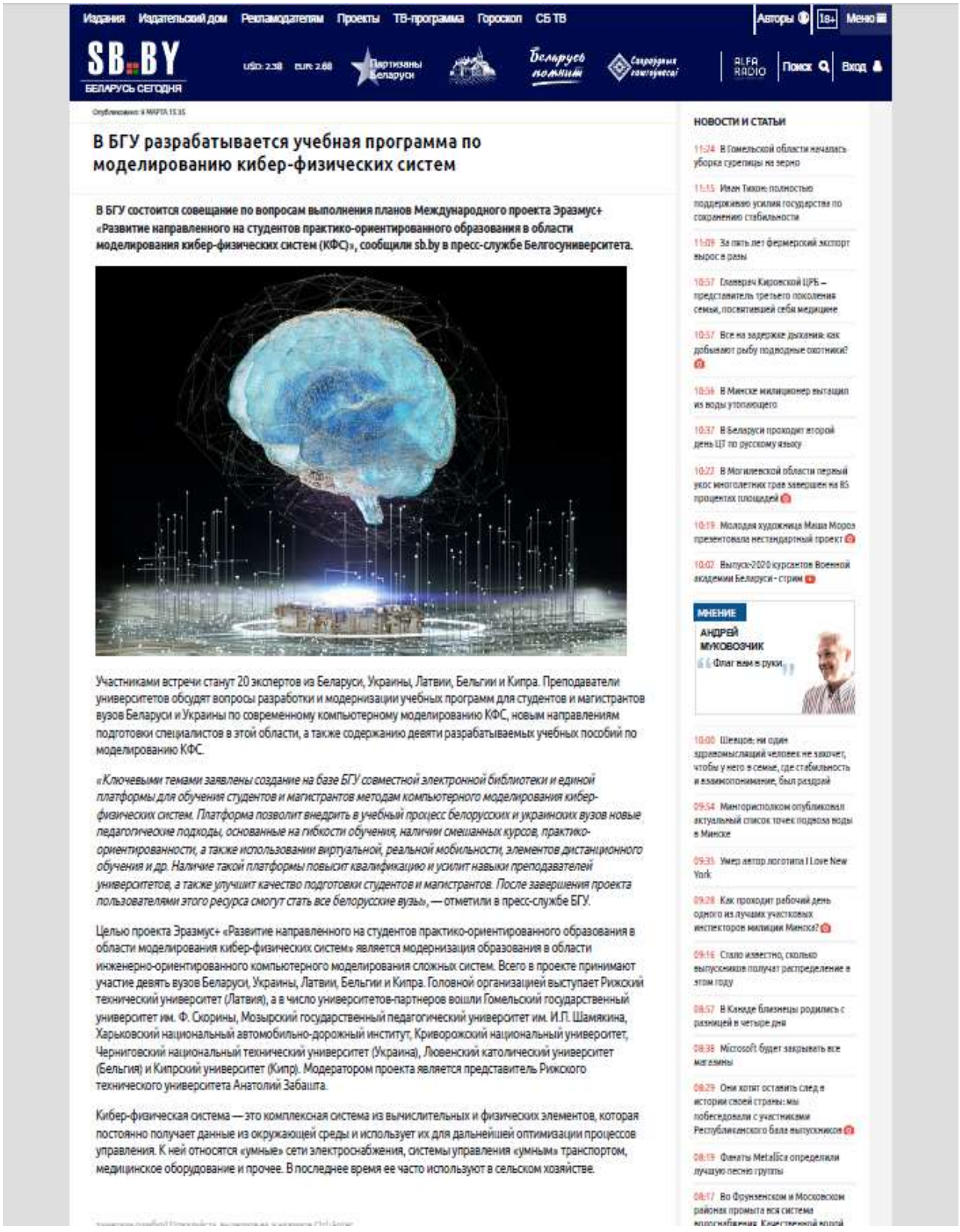

Издания Издательский дом Рекламодателям Проекты ТВ-программа Гороскоп СБ ТВ Авторы 18+ Меню

SB.BY БЕЛАРУСЬ СЕГОДНЯ

USD: 2.58 EUR: 2.88 Партизаны Беларуси Беларусь помним Сокровища гостеприимства ALFA RADIO Поиск Вход

Опубликовано: 6 МАРТА 15:35

В БГУ разрабатывается учебная программа по моделированию кибер-физических систем

В БГУ состоится совещание по вопросам выполнения планов Международного проекта Эразмус+ «Развитие направленного на студентов практико-ориентированного образования в области моделирования кибер-физических систем (КФС)», сообщили sb.by в пресс-службе Белгосуниверситета.

Участниками встречи станут 20 экспертов из Беларуси, Украины, Латвии, Бельгии и Кипра. Преподаватели университетов обсудят вопросы разработки и модернизации учебных программ для студентов и магистрантов вузов Беларуси и Украины по современному компьютерному моделированию КФС, новым направлениям подготовки специалистов в этой области, а также содержанию девяти разрабатываемых учебных пособий по моделированию КФС.

«Ключевыми темами заявлены создание на базе БГУ совместной электронной библиотеки и единой платформы для обучения студентов и магистрантов методам компьютерного моделирования кибер-физических систем. Платформа позволит внедрить в учебный процесс белорусских и украинских вузов новые педагогические подходы, основанные на гибкости обучения, наличии смешанных курсов, практико-ориентированности, а также использовании виртуальной, реальной мобильности, элементов дистанционного обучения и др. Наличие такой платформы повысит квалификацию и усилит навыки преподавателей университетов, а также улучшит качество подготовки студентов и магистрантов. После завершения проекта пользователями этого ресурса смогут стать все белорусские вузы», — отметили в пресс-службе БГУ.

Целью проекта Эразмус+ «Развитие направленного на студентов практико-ориентированного образования в области моделирования кибер-физических систем» является модернизация образования в области инженерно-ориентированного компьютерного моделирования сложных систем. Всего в проекте принимают участие девять вузов Беларуси, Украины, Латвии, Бельгии и Кипра. Головной организацией выступает Рижский технический университет (Латвия), а в число университетов-партнеров вошли Гомельский государственный университет им. Ф. Скорины, Мозырский государственный педагогический университет им. И.П. Шамякина, Харьковский национальный автомобильно-дорожный институт, Криворожский национальный университет, Черниговский национальный технический университет (Украина), Лювенский католический университет (Бельгия) и Кипрский университет (Кипр). Модератором проекта является представитель Рижского технического университета Анатолий Забашта.

Кибер-физическая система — это комплексная система из вычислительных и физических элементов, которая постоянно получает данные из окружающей среды и использует их для дальнейшей оптимизации процессов управления. К ней относятся «умные» сети электроснабжения, системы управления «умным» транспортом, медицинское оборудование и прочее. В последнее время ее часто используют в сельском хозяйстве.

НОВОСТИ И СТАТЬИ

11:24 В Гомельской области началась уборка гурешки на зерно

11:15 Иван Тихон: полностью поддерживаю усилия государства по сохранению стабильности

11:09 За пять лет фермерский экспорт вырос в разы

10:57 Главврач Кировской ЦРБ – представитель третьего поколения семьи, посвятившей себя медицине

10:57 Все на задержке дыхания: как добывают рыбу подводные охотники?

10:56 В Минске милиционер вытащил из воды утопающего

10:37 В Беларуси проходит второй день ЦТ по русскому языку

10:22 В Могилевской области первый укос многолетних трав завершен на 85 процентах площадей

10:19 Молодая художница Маша Морозова презентовала нестандартный проект

10:02 Выпуск-2020 курсантов Военной академии Беларуси - стрим

МНЕНИЕ

АНДРЕЙ МУКОВОЗЧИК

«Флаг вам в руки»

10:00 Шевцов: ни один здравомыслящий человек не захочет, чтобы у него в семье, где стабильность и взаимопонимание, был раздрай

09:54 Минюстиком опубликовал актуальный список точек подвоза воды в Минске

09:35 Умер автор логотипа I Love New York

09:28 Как проходит рабочий день одного из лучших участковых инспекторов милиции Минска?

09:16 Стало известно, сколько выпускников получат распределение в этом году

08:57 В Кинде близнецы родились с разницей в четыре дня

08:38 Microsoft будет закрывать все магазины

08:29 Они хотят оставить след в истории своей страны: мы побеседовали с участниками Республиканского бала выпускников

08:19 Фанаты Metallica определили лучшую песню группы

08:17 Во Фрунзенском и Московском районах прорыта вся система водоснабжения. Качественной воды

https://www.sb.by/articles/v-bgu-razrabatyvaetsya-uchebnaya-programma-po-modelirovaniyu-kiber-fizicheskikh-sistem.html

http://old.gsu.by/mundus/Erasmus+.asp

The traffic on the project's website is monitored using widely-adopted tools, such as Google Analytics. Specifically, for the project's website, internal tools for measuring impact will be adopted. This will create a good awareness for the consortium and help further target interested stakeholders.

The Moodle platform is maintained and hosted by Belarusian State University. However, all consortium partners will have excess to the platform and will contributing to its content during the implementation of the project - e-books, curricula and study programs, project documentation (reports and minutes of managing meetings and workshops, Ex-Ante Report, other intermediate reports), etc.).

4.1.2. Promotional material

4.1.2.1. Project logo

The design of the SybPhys logo was accepted by partners at the MC meeting. Following several consortium partner suggestions and an iterative selection process, the following was the winning design offered by MSPU, which will be used in all project dissemination and branding material. The logo is also shown below at the end of this issue.

4.1.2.2. Project leaflet

During the first year of the project, an introductory leaflet offered by RTU was designed, aimed at promoting the project objectives, the participating consortium organizations, and the beneficiaries of the expected outcomes.

4.1.2.3. Project posters

During the first year of the project running, posters should be designed and displayed at the 3 participating Belarusian academic institutions - Belarusian State University, Francisk Skorina Gomel State University and Mozyr State Pedagogical University named after IP Shamyakin.

3.1.2.4. PR campaign

The consortium will undertake campaigns PR using a series of email, Internet media and face-to-face promoting the project goals, objectives and expected outcomes. Emphasis will be put on the need to address the importance of striving to reform the Belarusian and Ukrainian higher education system according to the Bologna practices. As to Belarus, this reform will change curricula from the existing mixed system “5 plus 1”/“4+2” to “4+2” system which should comply with the Bologna system principles in the area of CPS modeling.

More specifically, for the media channels, the consortium will proceed in identifying key press channels (printed, online, TV and radio) at National and EU level.

4.2. Building uderstanding

A second-level of planned activities are mainly targeting creating understanding about the content of the SybPhys project. Such activities includes the described below issues.

3.2.1 Announcements/Presentations at workshops, seminars and conferences

Conferences, workshops and other scientific and similar events are considered as one of the most effective dissemination tools. For this reason, consortium partners have agreed to participate in carefully chosen conferences and to organize local workshops and sessions to promote the project. For instance, sessions will be organized for educational and other interested stakeholders by Ministry of Education of Belarus and Ministry of Education and Science of Ukraine. Consortium partners will also present papers and posters at various conferences. The first information about the SybPhys project was presented by the Mozyr State Pedagogical University in abstract at XII International Research-to-Practice Conference «Innovative Teaching Techniques in Physics, Mathematics, Vocational and Mechanical Training» March 05 – 06, 2020 (http://fizmat.mspu.by/node/608) and by Gomel State University in abstract at Republican scientific-methodical conference "Actual issues of scientific-methodological and educational-organizational work: a combination of classical approaches and innovative organizational-educational models and technologies" Gomel, March 12–13, 2020 (http://conference.gsu.by).

The consortium will maintain and update the list of planned and attended conferences and other events and use a series of metrics to capture the impact of these events. For example, the location of the event, the number of attendees, the type of work presented, and other related information will be captured through the metrics.

3.2.2. Press releases

As has been already mentioned, during the lifetime of the project and when important milestones have been met, the consortium will prepare dedicated press releases to be disseminated to the press and in Internet. The press releases will also be translated and disseminated in different languages. The first press release about SybPhys was sent by Belarusian State University before the Kick-off meeting in Minsk where were explained the project the goals, objectives and expected results, as well as were presented the members of consortium. The rest press releases will be devoted to the first set of results become available, such as the sessions for stakeholders and other meetings which are shifted on the later time due to Corona-virus.

4.2.3. Communication to other projects

The SybPhys consortium will set up communication channels and links to relevant EU and National projects.

4.2.4. Final conference

A final conference will be organized at the Institute for Nuclear Problems of Belarusian State University in Minsk in order to disseminate the project and its outcomes. The aim is to reach a broad and diverse audience of individuals interested in the project and the field of applied physics in general in order to promote the actions undertaken during the SybPhys project, its outcomes, and propose new paths for promoting further the modernization of education in the field of CPS modelling in Belarusian and Ukrainian universities.

4.2.5. Publications

As the SybPhys project has broader educational and research perspectives, it is expected that the partners will perform dissemination and exploitation activities aimed towards the scientific community. Therefore, the consortium plans to prepare and submit articles for publications in high quality academic conference proceedings and journals.

In addition to presentations, the publications may also be accompanied by demonstration scenarios and other visual materials promoting the project.

5. Achieving Engagement

While activities undertaken during the SybPhys project will benefit primarily the Belarusian and Ukrainian higher education systems, participating Universities and their students and master-level students, the actual engagement will reach a wider audience in the Belarusian and Ukrainian societies and the EU community. A reformation/improvement of the Belarusian and Ukrainian higher education systems to adhere to the Bologna practices and the involvement of the industry, the educational system and the Belarusian and Ukrainian Ministries of Education in this process will not only build awareness about the project but will also guide students of different levels in developing the required competences, skill and knowledge to compete in a globally competitive labor market. For this reason, the identified groups of interested stakeholders will be students of different levels, universities and faculties, and other educational and industrial experts that will be involved into discussions concerning the project's goals, objectives and

outcomes. Engagement will also be achieved by arranging face-to-face meetings with interested stakeholders, discussing and receiving feedback from them, introducing the newly developed and modernized bachelor- and master-level programs in the field of CPS modeling, and updating courses and teaching materials/tools in the declared field. The engagement of the Institute for Nuclear Physics of BSU, NGOs (Belarusian Association of Nanoindustry (RANI), Belarusian Physical Society (BPS)) as well as the Ministries of Education of Belarus and Ukraine and other associated partners will also be required to administer surveys, questionnaires, and field visits to other Belarusian and Ukrainian higher education institutions and enterprises.

To involve the labour market, consortium partners will undertake the following steps: (a) Devise two sets of questionnaires: a curriculum questionnaire and a questionnaire for the evaluation of special courses and laboratory study programs. (b) Then a panel of experts who are also members of the Belarusian and Ukrainian consortiums will be interviewed. For example, experts from the BPS, RANI, INP BSU, from the laboratories of the institute of the National Academy of Sciences of Belarus, from Public Joint Stock Company "Kharkiv enterprise of bus stations, JSC "INTEGRAL"- Holding Managing Company of Belarus and V.M. Glushkov Institute of Cybernetics of National Academy of Ukraine as well as the heads of the departments/laboratories of Belarusian and Ukrainian universities will be interviewed. The experts will be invited to share their views on the transition/improvement of higher education in Belarus and Ukraine to the Bologna “4 + 2” system and the importance of introducing new training programs, new/improved courses and laboratory works from CPS modeling field to help students build new competences and skill in this area. Consequently, the results of the project will engage further collaboration between HEIs, NGOs and business in Belarus and Ukraine and promote the availability of a high-skilled workforce in the domain of CPS modeling.

5.1. Maximize impact and sustainability

The last but not least by influence on the dissemination and exploitation activities is the maximisation of the impact and sustainability of project results. They are important to clearly identify all exploitable results and outcomes, such as the development of modern bachelor- and master-level programmes in the field of CPS modelling, the development and modernization of courses and teaching materials/tools and ICT-based teaching/learning activities, the preparation of students of different levels to compete in the labour market. Through this process, the reformation/improvement of the education systems in Belarus and Ukraine and the implications of this process for the Belarusian and Ukrainian educational systems will be addressed and achieve a higher level of impact and sustainability for the project. Five model curricula on CPS modelling will also be developed. These programs will be approved either by the Ministries of Education of Belarus and Ukraine or Universities authorities during the second year of the project. In the second year of the project, study programs, as well as sets of curricula subjects (special courses and laboratory practices) for each of the universities will be developed on the basis of the approved Model (standard) educational programs.

All these actions and initiatives will be promoted to maximize the impact and sustainability of the project. Compatible standard study programmes (including lecture courses, laboratory classes and appropriated didactic materials and tools) by five directions will be developed in English and Russian. The

teaching/learning materials described in study programs of courses and laboratory practices will be distributed by 9 e-books. The overall objective of the exploitation strategy of the project will be that the consortium partners (the participating academic institutions) collaboratively exploit the results and outcomes and reach out to both the education and industrial sectors to ensure high impact and visibility of the project results.

6. Description of Partner Involvement in Dissemination and Exploitation Activities

Consortium partners have a rich and diverse experience in delivering EU projects and in building the effective dissemination and exploitation networks in order to reach the declared goals, objectives and outcomes be the interested education, industry and other related stakeholders. Consortium of all 15 partners will be involved in the multiple dissemination and exploitation activities that will be undertaken throughout the duration of the project and beyond. The Institute for Nuclear problems of BSU will lead consortium partners in ensuring that all dissemination and exploitation activities are delivered on time and have a high impact within the Belarus, Ukraine and broader EU community. Some of the activities that consortium partners will undertake include:

- Press conferences, press releases, leaflets, posters, information in TV, radio and social media, as well as project logo
- Project website design/development and its regular updating by information on dissemination and a course of the project implementation
- Seminars/workshops for stakeholders in the Ministries of Education of Belarus and Ukraine
- Information sessions
- Final conference
- Double-sided agreements
- Preparation for 2nd year bachelor- and master-level programmes testing beyond the project
- Conference papers and presentations

Table 1 below provides a detailed plan of all dissemination and exploitation activities with each partner's involvement, responsibility and due dates as they appeared on the original proposal that was funded. The status of each dissemination activity is also indicated. This plan is leaned on the dissemination and exploitation goals described in WP6.

Table 1. Plan of dissemination and exploitation activities

Item	Activity	Responsibility	Due Date	Status
WP6.1	Information/ promotional materials	INP BSU	14.11.2022	Permanently
M01 (WP6.1)	Press Conferences	INP BSU All Consortium Partners (RTU, KU Leuven, UCY, BSU, GSU, MSPU, BPS,	14.11.2022	

		RANI, INTEGRAL, CNTU, KhNAHU, KNU, Ukrainian ass. Partners)		
M01 (WP6.1)	Press Releases	INP BSU All Consortium Partners (RTU, KU Leuven, UCY, BSU, GSU, MSPU, BPS, RANI, INTEGRAL, CNTU, KhNAHU, KNU, Ukrainian ass. Partners)	14.11.2022	BSU – 2 press releases Adresses: https://eduphys.bsu.by/mod/folder/view.php?id=2270
M01 (WP6.1)	Leaflets	Riga Technical University (RTU) All Consortium Universities (RTU, KU Leuven, UCY, BSU, GSU, MSPU, CNTU, KhNAHU, KNU)	14.11.2022	
M01 (WP6.1)	Posters	All Consortium Universities (RTU, KU Leuven, UCY, BSU, GSU, MSPU, CNTU, KhNAHU, KNU)	14.11.2022	
M01 (WP6.1)	TV and Radio Interviews	All Consortium Partners	14.11.2022	
M01(WP6.1)	Social Media	University of Cyprus (All Partners)	14.11.2022	
M01 (WP6.1)	Project Logo	Riga Technical University (RTU)	14.11.2022	Ready
M01 (WP6.1)	Conference Papers and Presentations	All Consortium Partners	14.11.2022	BSU – 2 conferences Adresses: https://eduphys.bsu.by/mod/folder/view.php?id=2268
WP6.2	Information sessions for target groups	INP BSU	14.11.2021	
M02 (WP6.2)	Information from Ministries of Education of Belarus and Ukraine	INP BSU All Consortium Universities from	14.11.2021	

		Belarus and Ukraine		
M02 (WP6.2)	Round table of representatives of job markets of Belarus and Ukraine	INP BSU All Consortium Universities from Belarus and Ukraine	14.11.2021	
M02 (WP6.2)	Seminar for Stakeholders in the Ministries of Education of Belarus and Ukraine	INP BSU All Consortium Universities from Belarus and Ukraine	14.11.2022	
M02 (WP6.2)	Final Conference	INP BSU	14.11.2022	
M03 (WP6.3)	Use of project Web Portal and social media	Riga Technical University (RTU) Belarusian State University (BSU) – Moodle Platform	14.11.2022	Permanently
M04 (WP6.4)	Recommendations for new training programs for the targeted stakeholders beyond the project	INP BSU All Consortium Universities and associated partners from Belarus and Ukraine	14.11.2022	
M04 (WP6.4)	Preparation of bachelor- and master-level programmes	INP BSU All Consortium Universities from Belarus and Ukraine	14.11.2022	
M04 (WP6.4)	Reviewing of bachelor- and master-level programmes	INP BSU and associated partners (RANI, BPS, INTEGRAL, Ukrainian)	14.11.2022	
M04 (WP6.4)	Testing of bachelor- and master-level programmes	All Consortium Universities and associated partners from Belarus and Ukraine	14.11.2022	
M04 (WP6.4)	Preparation of 2nd year testing of bachelor- and master-level programmes (beyond the project)	INP BSU All Consortium Universities from Belarus and Ukraine	14.11.2022	

M05 (WP6.5)	Strengthening the academia – industry network	INP BSU	14.10.2021	
M05 (WP6.5)	Conducting surveys among members of the academia – industry network concerning needs of job markets	INP BSU All Consortium Universities and associated partners from Belarus and Ukraine	14.11.2022	One survey – all partners https://eduphys.bsu.by/mod/folder/view.php?id=2253
M05 (WP6.5)	Double-sided Agreements between Partners and NGO from Belarus and Ukraine	INP BSU All Consortium Universities and associated partners from Belarus and Ukraine	14.11.2022	
M06 (WP6.6)	Hosting and maintenance of e-Learning and SMSE platform beyond the project	INP BSU BSU		Permanently
M06 (WP6.6)	Development new virtual laboratory works on CPC modeling	INP BSU BSU		
M07 (WP6.7)	Strengthening cooperation beyond the project to sustain the outcomes/results	INP BSU	14.11.2022	

The course of the SybPhys implementation will be controlled through communication reports in form of presented in **Attachment 1**, which will be sent monthly by every partner university to INP BSU.

7. Conclusion

Active and well-planned dissemination and exploitation of the project contributes to the enrichment of global knowledge in the identified target domain, to raise awareness in the scientific community and to exploit potential synergies with related research projects. This document summarises the current and planned state of dissemination and exploitation activities carried out as part of the SybPhys project. The SybPhys consortium has been active in all dissemination channels: conferences, meetings, workshops, and publications. Furthermore, a considerable repository of dissemination material, including press releases, posters and leaflets, was created and distributed.

The Internet presence of the project ranges from the SybPhys project's main website, which comprises a public means of communication and providing information to interested stakeholders, as well as to the Facebook and LinkedIn groups.

Attachment 1: Table 2. The form of the **report on dissemination and communication activities** in CybPhys.

This table shows examples of dissemination activities undertaken by the project partners[*)]*.

Date	Partner, Presenter, Author	Title of document or activity	Type (doc, ppt, etc)	Link to document on slideshare, blogspot, website, etc
04/12/2019	BSU, Fedotov Alexander K.	Press-release to Kick-off Meeting, Minsk	doc	http://physics.rtu.lv/
05-06/03/2020 Mozyr	MSPU, I. Kovalchuk V. Shepele-vich	XII Internat. conf. "Innova-tive teaching techniques in physics, mathematics, vocational and mechanical training"	Book of Abstract, pdf	https://eduphys.bsu.by/mod/folder/view.php?id=2268
18/04/2020	BSU, Fedotov Alexander K. Fedotov Alexander S.	Screenshots of News, Activities, etc.	pdf	https://bsu.by/news/1072723-d/ http://earchives.bsu.by/handle/link/7276 https://www.sb.by/articles/v-bgu-razrabatyvaetsya-uchebnaya-programma-po-modelirovaniyu-kiber-fizicheskikh-sistem.html

[*)] Every member of SybPhys consortium should send such report monthly to Prof. A. Fedotov by address fedotov@bsu.by .