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## **DEVELOPMENT OF DIGITAL INNOVATION HUB BASED ON THE SCIENTIFIC AND EDUCATIONAL COLLABORATION BETWEEN NORWAY AND UKRAINE**

In the conditions of the digital economy and challenges of the new age of innovations, the need for the integration of science and business is growing, in particular, to provide relevant solutions for the prioritized industries in Ukraine. The high level of complexity of current business tasks causes the necessity to carry out the qualified expertise for small and medium-sized enterprises (SMEs). One of important applied issues is to enhance the technological readiness of SMEs - the start point for best practices in innovative projects.

Nowadays, the expert consulting on the implementation of new technologies in the prioritized fields plays the significant role. Thus, the promising vectors of business assistance are as follows:

- analysis of the economic, technical and technological potential of a particular industry;
- case studies of needs and requests from SMEs;
- evaluation of technological readiness of SMEs;
- qualified expertise of business processes, problems, and perspectives;
- development of professional solutions for best innovative practices and technology transfer.

The mentioned list of activities may be provided based on the Digital Innovation Hub (DIH) as the center for collaboration of professionals in science and applied economics which can lead to an efficient integration of both sectors.

Due to [1], European DIHs assist businesses in enhancing business/production processes, products, or services utilizing digital technology by giving access to technical expertise and testing, as well as the opportunity to "try before investing."

Additionally, they offer innovative services that are essential for a successful digital transition, such as finance guidance, education, and skill development. Environmental considerations are also made, particularly in relation to the application of digital technology to sustainability and circularity. The advantages of having a local presence are combined with the possibilities offered by a pan-European network in DIHs. They are in a good position to offer the services that local businesses require thanks to their regional presence and access to the region's innovation ecosystem.

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" has 24 educational departments, 13 science departments, over 200 scientific groups, 38 educational and scientific laboratories that give additional opportunities for its Digital innovation hub "Center 4.0". The "Centre 4.0 Igor Sikorsky Kyiv Polytechnic Institute" is mentioned as one of two Ukrainian DIHs by European Commission [2]. DIHs of this type are considered to be effective tools for developing an innovative ecosystem of industrial high-tech companies and SMEs.

The "Centre 4.0 Igor Sikorsky Kyiv Polytechnic Institute" is positioned as a national center, providing coverage of a wide range of Industry 4.0 technologies. It provides scientific research concerning advanced or

high performance computing; Big data, data analytics, data handling; cyber physical systems, cyber security; Internet of things; laser based manufacturing; nanotechnology; robotics.

The main partners who collaborate within the hub are as follows: National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (R&D, testbeds, networking); Association of Industrial Automation of Ukraine (Engagement of SME, community management, product marketing, communication); Innovation Holding Sikorsky Challenge (Commercialization of innovation projects, Acceleration projects).

An international scientific and technical cooperation is a source of development of competences of the University as a participant of the innovation center. Cooperation with universities of the world's leading economies provides an opportunity to borrow experience and acquire competences in researching the latest technologies. A good example of such a collaboration is the project CPEA-LT-2017/10047 "NTNU-KPI Collaboration within Industry 4.0 Education" (2018-2022) described in [3] and maintained on the wiki-page [4].

The project endeavors to develop the concept of attractive education within the Sustainable Manufacturing in Industry 4.0 frameworks.

Work on the project provided an opportunity to instigate changes in high education field:

- strengthening existing regional collaboration between the institutions and establishing new contacts both among staff and students;
- deepen knowledge in the field of Industry 4.0 and smart factories;
- implement academic mobility of students, graduate students and lecturers;
- improve the educational process in both universities on the principle of progressive learning oriented towards new social and technological challenges;
- creating a vision and strategy of innovative interaction between all educational stakeholders.

Among the effects of the project, it is advisable to highlight the advanced chain "knowledge-technology-experience" and new teaching and expert skills.

During the implementation of the project, partner universities held a number of joint personal and online meetings, among which the following deserve a special attention:

1. Two summer schools with a total number of participants of more than 300 people from 11 countries of the world (2019 in Norway on the basis of NTNU, 2020 in Ukraine on the basis of KPI).
2. Workshop in a mixed format "Industry 4.0 Education: Milestones and Outputs" with an organized excursion to the Learning factory at NTNU (2022).
3. Working meetings dedicated to the development of the project proposal, and further discussion of current tasks and a tool kit for their solution (2017-2022).
4. Events dedicated to the academic mobility - a long-term and a short-term mobility of students; guest lecturing of teachers.
5. Participation in the Final Eurasia Program Conference (Bergen, Norway, 2022).

The holding of these events provided an opportunity to expand the scientific field for communication, identify potential partners from other countries for further joint research on priority topics, and exchange experience in related areas of project activity.

Considering the experience of Norwegian University of Science and Technology, namely a great net of professionals in the Department of Manufacturing and Civil Engineering, Research centres and EU collaboration, Technology Transfer AS, Cluster collaboration - NCE, GCE and ARENA clusters and others, the opportunity to cooperate with scientists and experts is promising for National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" and important for further development of the methodology of research and consulting within the existing DIH.

#### References:

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