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POLYTECH
Peter the Great St.Petersburg Polytechnic University

POLYTECH DAYS IN BERLIN 2020

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DIGITAL TRANSFORMATION OF INDUSTRY

Nowadays digital transformation of industry is one of the priorities of the leading countries in the world. As well, Russia is not an exception. The Strategy for Scientific and Technological Development of the Russian Federation "National Technology Initiative" (NTI) and the "Digital Economy of the Russian Federation" program are focused on the task of digital transformation of industry through the development of new manufacturing technologies.

Peter the Great St. Petersburg Polytechnic University is one of the initiators and developers of these programs in the area of "Advanced manufacturing technologies". The leading role of SPbPU as a national leader is supported by the unique experience of multidisciplinary high-tech projects implemented jointly with the leaders of Russian and world industry. The University became the national center of competence of the National Technology Initiative in the field of "Advanced manufacturing technologies". In 2019 within the assignment from the Russian Federation government SPbPU developed a roadmap (approved in October 2019) for the development and implementation of advanced manufacturing technologies up to 2024 with a total volume of more than 2 billion euro as part of the National Program of the Russian Federation "Digital Economy". SPbPU developments provide for creating world-class equipment for such areas as aircraft construction, automotive industry, engine building, shipbuilding, machine-tool building etc. SPbPU is a leader of a consortium of over 60 high-tech organizations, including Gazprom, Rosatom, Roskosmos, Rostec, United Engine Corporation, United Aircraft Corporation, Russian Helicopters, JSC KAMAZ and other companies.

The most important competencies of SPbPU:

1. Digital design, mathematical modeling and product life cycle management (Smart Design).
2. Smart Manufacturing technologies.
3. New materials (composite materials, nanomaterials, metamaterials, technologies for the development and production of materials with required properties).
4. Additive technologies and additive manufacturing.

SPbPU in comparison with all Russian organizations has been the most successfully implementing the process of digital design and modeling (Smart Design), based on the creation of Smart Digital Twin products and manufacturing processes.

An important role in organizing this process is played by the digital platform for virtual design developed at SPbPU. This platform is the basis for digital design and modeling, conducting virtual tests, creating "smart" digital twins and manufacturing processes, taking into account targets, manufacturing and resource constraints of the customer throughout the entire product life-cycle. The platform also serves to integrate the intellectual, software and computing infrastructure for all participants in the development and manufacturing process.

A number of successfully implemented projects give us the opportunity to say that only the use of "smart" digital twins provides for manufacturing of globally competitive products in the shortest possible time and minimizing costs, as well as the ability to quickly customize and optimize products to meet market requirements or to overtake competitors (time-to-market), which in turn creates the basis for new business models introduction and the overall digital transformation of the industry.

Track participants will discuss the following:

1. Industrial digital transformation programs: experience and prospects.
2. The use of "smart" digital twins: approaches and interpretations, the implementation of industrial projects.
3. Opportunities for cooperation in the field of advanced manufacturing technologies and digital transformation of industry.

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