CREONOMYCA HiTech & Engineering cluster

IITB

world skills Russia

Competitions of professional mastery

«DIGITAL INDUSTRY» SKILL

BRICS Business Council

DIGITAL SKILLS

ХАЙТЕК

Partners:

R-Pro IT-CONCERN

R-PRO DIGITAL

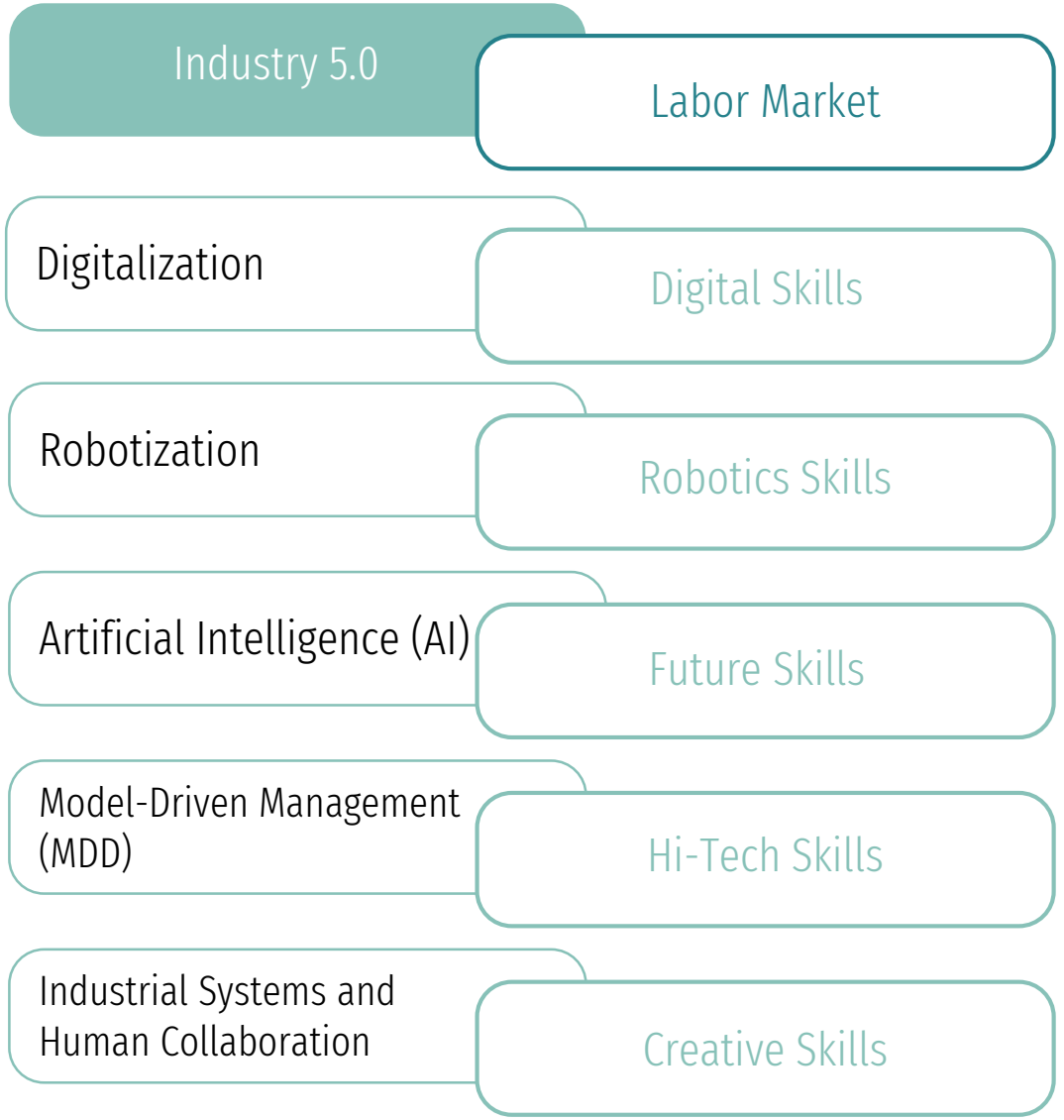
R-Pro ROBOTICS

ecc MARKET

FUTURE INDUSTRY TRENDS

According to the Global Education Futures and WorldSkills Russia experts:

- **Automation, digitalization, and robotization** will lead to the creation of the cyber-physical systems of mass production with the minimal human involvement.
- **Public services** of the human activity is increasingly substituted with AI- and Internet-based mechanical systems both within communication with clients (front-office) and in the internal work (back-office).



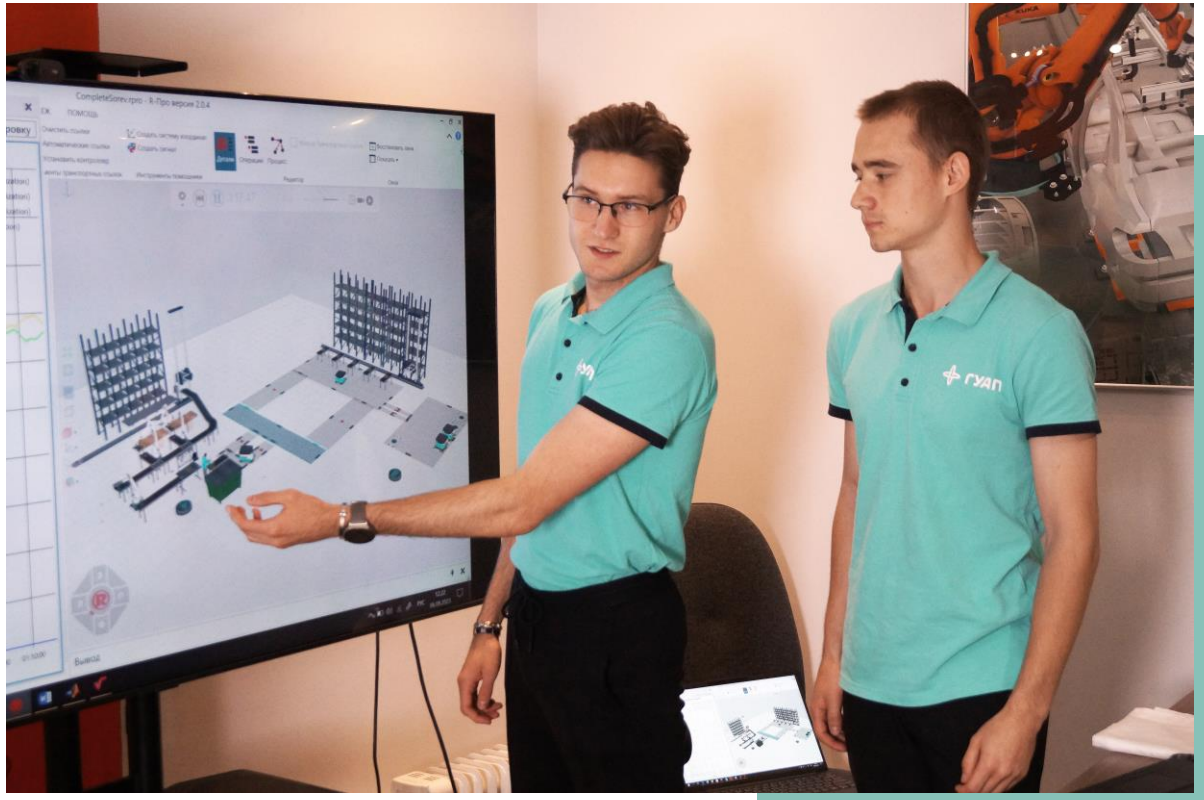
DESCRIPTION OF “DIGITAL INDUSTRY” SKILL

The **“Digital Industry” skill** englobes knowledge and skills for rational creation of new industries and modernization of existing ones, their exploitation, provision of their efficacy and productive work aligned with modern innovative digital technologies and AI.

Professional skills **competitions within the “Digital Industry” skill** combine a set of tasks aimed at rational application of **modern digital technologies for organizational and technological design of the manufacture** in the environment of digital twins, engineering and virtual setup of manufacturing robot cells or lines, optimization of production processes based on digital analytics to ensure the best technical and economic performance of production.

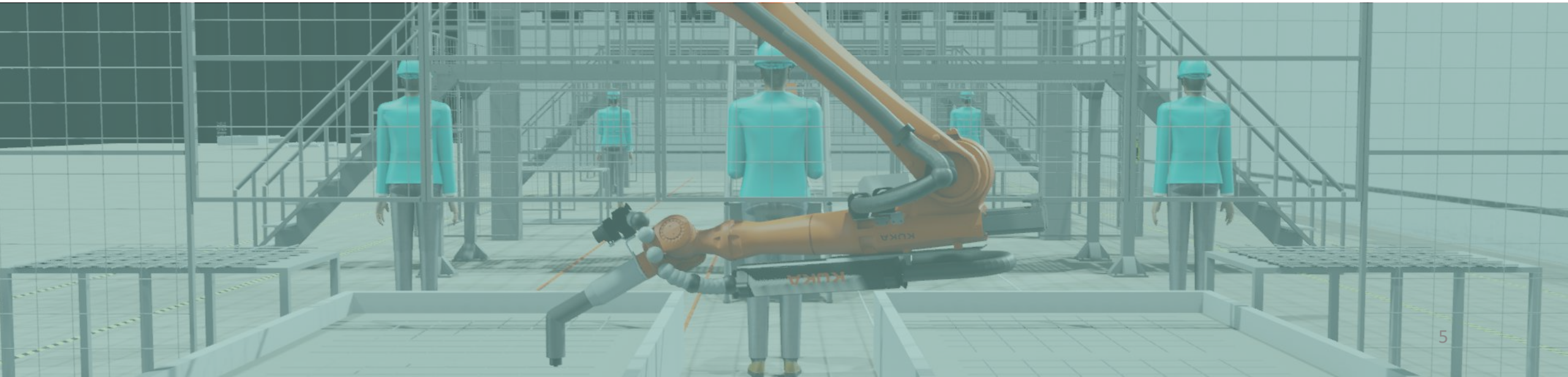
SKILLS AND KNOWLEDGE

- The use of digital twins in manufacturing
- Organizational and technological design
- Simulation and optimization
- Virtual commissioning
- Intelligent controlling
- Project management
- Teamwork
- Economic analysis and risk management
- Innovation, creative thinking



CHAMPIONSHIP STRUCTURE WITHIN THE "DIGITAL INDUSTRY" SKILL

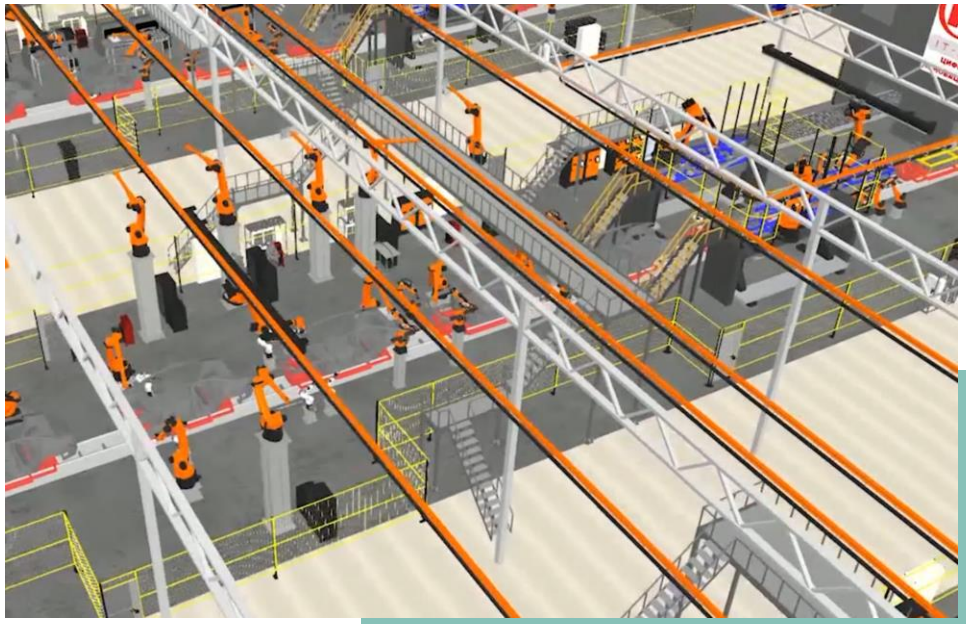
TASK 1	Creation of the digital twin for the manufacture of the future
TASK 2	Digital engineering and virtual commissioning of the manufacturing robot cell and/or line
TASK 3	Digital analytics and manufacturing process optimization
TASK 4	Creation of the virtual tour around the manufacture of the future



CHAMPIONSHIP STRUCTURE WITHIN THE “DIGITAL INDUSTRY” SKILL

TASK 1

Creation of the digital twin for the manufacture of the future



Creation of the digital twin for manufacture in the **software “Rational Production”**

Participants are assigned to:

- Choose the variant of the manufacturing and the types of equipment;
- Design digital twins for production relying on the scheme;
- Identify the most rational position for each element within the manufacture and logistics of the production flow.

Timing: 8 hours.

CHAMPIONSHIP STRUCTURE WITHIN THE “DIGITAL INDUSTRY” SKILL

TASK 2

Digital engineering and virtual commissioning of the manufacturing robot cell and/or line

Offline programming of the manufacturing equipment, virtual commissioning in the “Rational Production” software and transferring programs to the hardware equipment.

Participants are assigned to:

- Deploy a digital twin for the robotic cell and/or line;
- Develop a program for its functional processes and transfer it to the real-life hardware equipment by using the Internet of things technology;
- Perform virtual commissioning of the cell and/or line.

Timing: 4 hours.

CHAMPIONSHIP STRUCTURE WITHIN THE “DIGITAL INDUSTRY” SKILL

TASK 3

Digital analytics and manufacturing process optimization

Gathering data describing the robotic manufacturing and the optimization of the robot’s functionality in the “Rational Production” software relying on the key factor analysis

Participants are assigned to:

- Develop an optimized manufacturing scenario where its digital twin is completed during the TASK 1;
- Collect data about the digital twin according to the optimized scenario;
- Complete a digital analytical dash-board.

Timing: 2 hours.

CHAMPIONSHIP STRUCTURE WITHIN THE “DIGITAL INDUSTRY” SKILL

TASK 4

Creation of the virtual tour around the manufacture of the future

- Creation of the virtual tour around the manufacturing fabric’s digital twin;
- Creation and delivery of the presentation about the procedure of work done to complete the tasks.

The team championship is assessed according to the success achieved at each stage of the competition.
To gain the final assessment score, a team has to perform all tasks.

Timing: 4 hours.

Total timing for all 4 tasks: 18 hours.

FACILITIES FOR THE CHAMPIONSHIP WITHIN THE “DIGITAL INDUSTRY” SKILL

1

Working spaces for each participant:

- Personal computer (PC) with the software for designing digital twins and offline programming (software “Rational Production”);
- VR headset (synchronized with the software “Rational Production”).

2

To complete TASK 2, there are additional:

- Mounting table – 2;
- Drive roller – 1;
- Optical sensors – 2;
- Industrial robot (e.g., KR 10 R1100-2, F. KUKA);
- A pedestal or other equipment suitable for installing a robot;
- Protective structures with automation and security system for industrial robots;
- Clamping arrangements and other payloads for industrial robots, depending on the designed technological process and their auxiliary equipment;
- System of the computer vision (CV) and Internet connection;
- A set of billets for testing the technological process – in the number of participating teams +1 for to set up.

(To reduce unnecessary costs, the TASK 2 can be performed without additional equipment only by using the software.)

The championships are held **either in online or offline format**.

LEADING EXPERTS OF THE “DIGITAL INDUSTRY” SKILL

CHIEF EXPERT, MANAGER OF THE «DIGITAL INDUSTRY» SKILL

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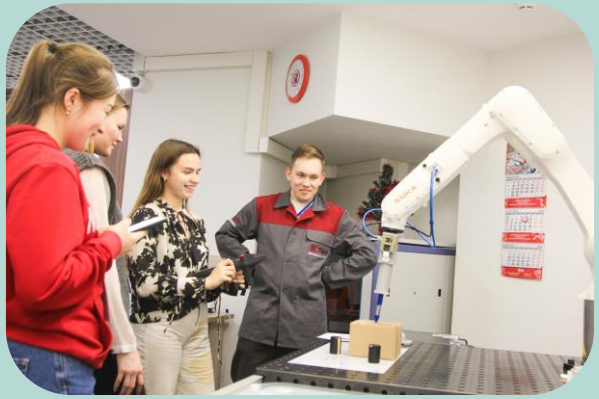
EDUCATIONAL TRAINING CENTER WITHIN THE “DIGITAL INDUSTRY” SKILL BY IITB

IITB
Institute of Innovative Technology in Business

- Training and professional development for specialists in all aspects of digital manufacturing
- Educating of experts to hold regional competitions within the “Digital Industry” skill
- Educating teams to participate in competitions within the “Digital Industry” skill
- Training ground
- Educational and methodological literature
- Specialists’ support
- Equipment and software for competitions for rent

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PARTNERS OF THE “DIGITAL INDUSTRY” SKILL

CO-ORGANIZERS

CREONOMYCA HiTech & Engineering cluster

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CHAMPIONSHIPS WITHIN “DIGITAL INDUSTRY” SKILL

1st half a year — Online

- Open Russian Championship, February
- International Championship BRICS+ Future Skills Challenge, April

2nd half a year — Offline

- International Championship Digital Skills during the Kazan Digital Week forum, Kazan, September
- International Championship of high-tech jobs “Hi-Tech”, Ekaterinburg, November
- International Championship “Robotics Skills” during the Russian Robotics Week, St. Petersburg, November

CONTACTS

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