Institute for Statistical Studies and Economics of Knowledge

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Statistical measurement of the demand for personnel with AI skills and the impact of AI on the labor market

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Structure

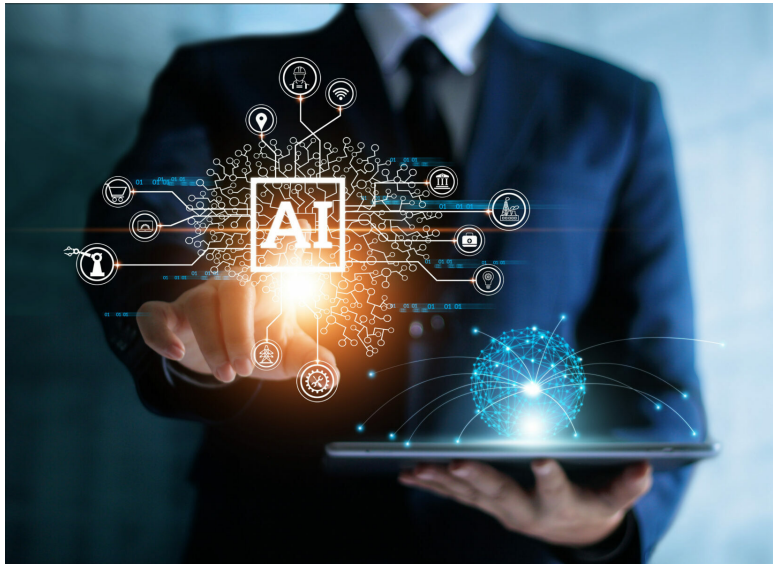
1. International experience
2. Russian experience
3. Estimates of the demand for personnel with skills related to AI technologies and the impact of AI on the labor market (according to HSE data)
4. Key findings

Artificial intelligence (AI) technologies are being adopted by more and more organizations, but for many, AI integration is still in its early stages

The research identifies various effects of AI implementation on labor:

- substitution of labor with technologies;
- transformation of work tasks;
- increase in labor productivity;
- increase in labor demand for non-automated tasks and work with AI;
- etc.

(Frey, Osborne, 2017; Jarrahi, 2018; Spencer, 2018; Acemoglu and Restrepo, 2019; Benbya, Davenport, Pachidi, 2020)



! Measuring and analyzing the need for personnel with AI skills and the impact of AI on the labor market is necessary to assess the progress toward achieving the SDGs, since these technologies may have both positive and negative impacts on the achievement of the goals.

International experience in measuring the impact of AI on the labor market

There are still no international statistical standards for measuring AI and its impact on the labor market

National statistical agencies and international organizations have attempted to assess the phenomenon:

- **European Skills and Jobs Survey (2021)**: a question on the presence of a skill in writing software using AI methods [CEDEFOP, 2023] is used – a narrow approach that allows to identify specialists in the field of AI;
- **Surveys of workers and employers on the impact of AI on their work** as part of the OECD Future of Work initiative [OECD, 2022a, b,c]: experience of using AI technologies and the effects of their implementation on employees' work were measured. Information was collected on the following formats of employee interaction with AI: "working with AI", "managing employees who work with AI", "developing / supporting AI technologies". Hence, the OECD used a broad approach that allows to identify all workers with AI skills.
- Surveys of organizations in other countries included questions about the impact of AI on employees of organizations (USA, UK, etc.)

Since 2025 comprehensive monitoring of the impact of AI technologies on the labor market has been organized in Russia

According to the National Strategy for the Development of Artificial Intelligence for the period up to 2030:

- new challenges for Russia include a shortage of highly qualified specialists in the field of AI and a shortage of personnel to ensure the mass implementation of AI technologies;
- the main objectives of the development of AI technologies in Russia include increasing the level of citizens' competencies in the field of AI and their awareness of the relevant technologies

It is planned to track the goals of the Strategy using the following indicators:

- The share of employees with skills in using AI technologies in the total number of employees;
- The number of graduates who have finished higher education programs in the field of AI

From 2025 as a part of statistical observations, information is collected in the following areas:

- the current number of and need for personnel with skills in the field of AI technologies;
- the impact of AI technologies on the labor market;
- the prevalence of skills in using AI among the population as a whole;
- training of personnel with skills in the field of AI (in planned but not approved yet)

Examples of statistical indicators that will be measured

Statistical form No. 3-inform

- Number of employees with AI competencies
- Number of open positions for AI specialists
- Number of employees who have been trained in the implementation and use of AI technologies
- Number of full-time employees who require training in the implementation and use of AI
- Effects on labor
- Labor barriers to AI implementation

Statistical form No.1-Z

- Demand for AI skills (three levels of complexity)
- Shortage of AI skills (three levels of complexity)

Statistical form No.1-IT

- Population with AI skills

Statistical form No. 1-II(obrazovanie)

- Admission / graduation / number of students in higher education AI-oriented programs (AI profile)
- Number of AI-oriented programs I/ educational programs containing a module on AI
- Types of AI technologies studied
- Teaching staff for disciplines aimed at mastering AI technologies
- Infrastructure for teaching AI technologies

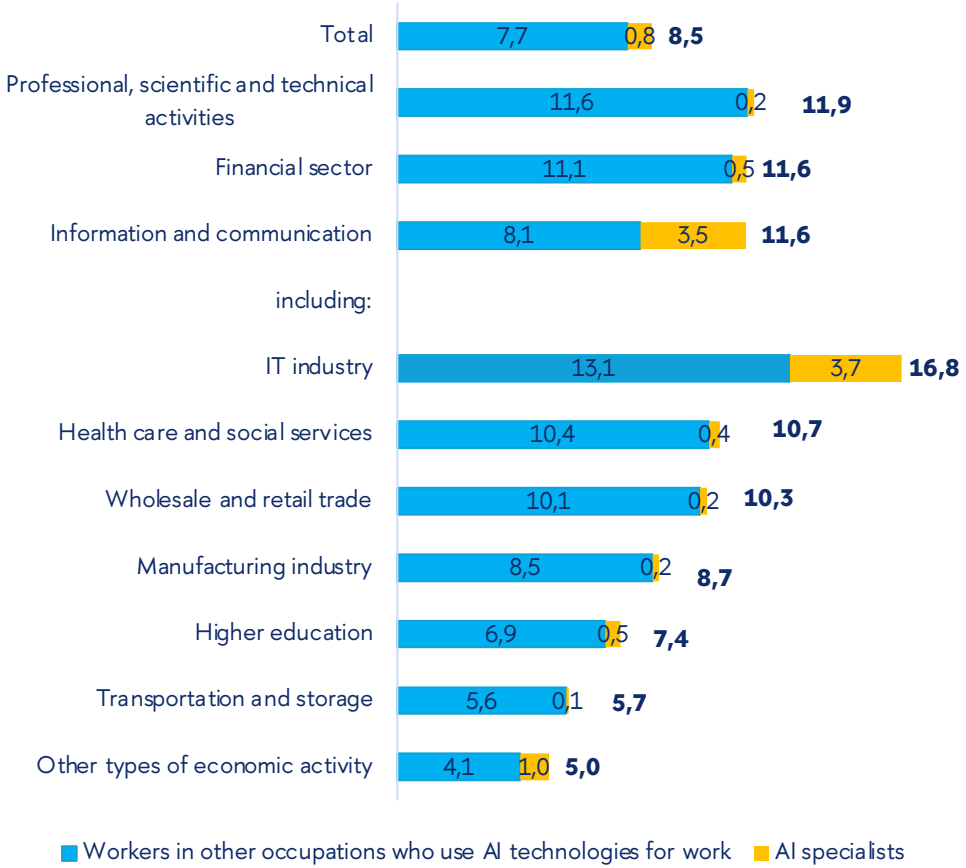
AI specialists work in every fourth organization that uses AI technologies

- For every AI specialist, there are more than nine workers in other professions who use AI technologies for their work.
- The highest proportion of workers with AI competencies are in the professional, scientific and technical activities, as well as in the financial sector.

AI specialists – IT specialists who are able to develop, implement and support AI technologies

More details: https://issek.hse.ru/news/986408315.html

Figure 1. Employees with AI competencies by type of economic activity: 2023
(as a percentage of the total number of employees of surveyed organizations using AI)



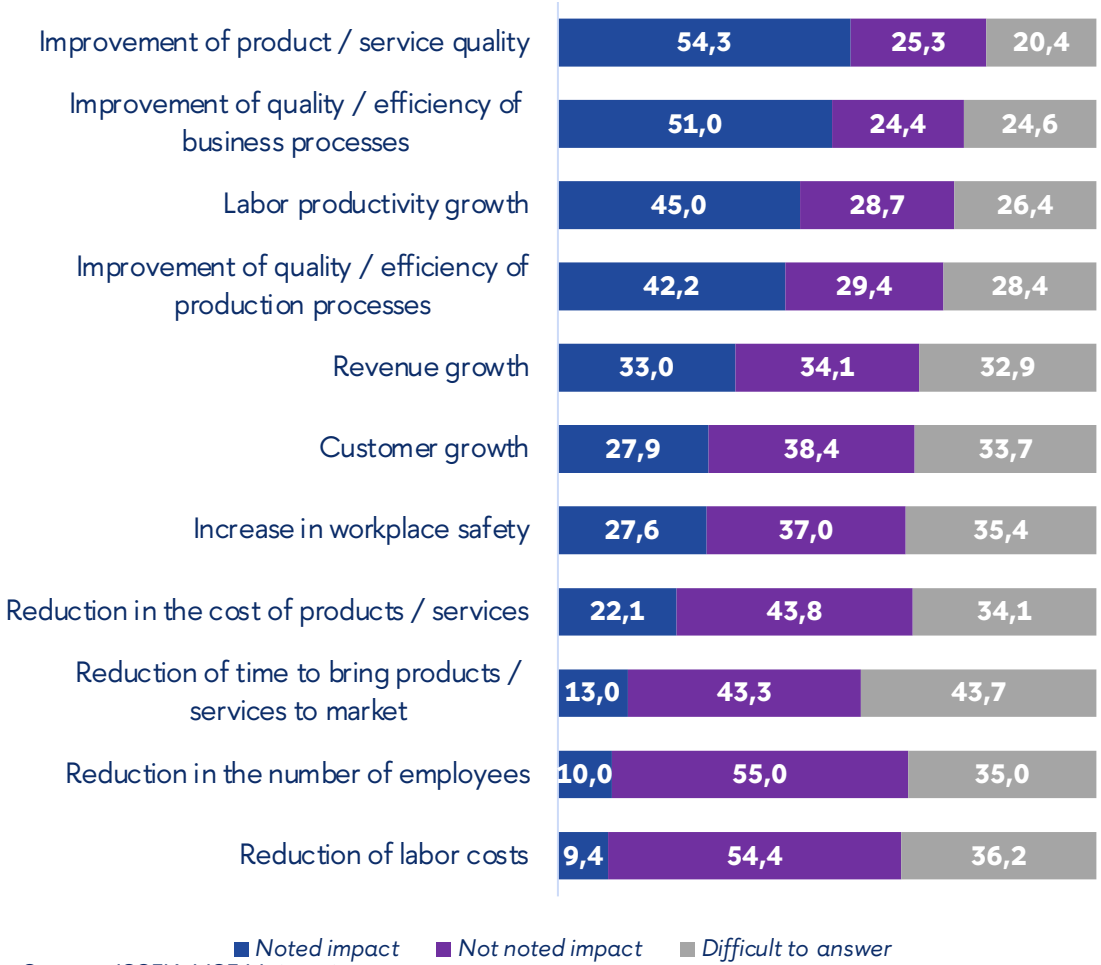
Source: ISSEK, HSE University

The introduction of AI technologies primarily leads to an increase in the quality of products/services, the efficiency of business processes and labor productivity

- The least common effects of AI on the work were a decrease in the number of employees and a decrease in labor costs
- An increase in occupational safety was reported by a quarter of AI-using companies
- A shortage of AI specialists is one of the key problems which faced half of AI-using organizations.

More details: https://issek.hse.ru/news/991610162.html

Figure 2. Organizations' assessment of the effects of the introduction and use of AI technologies: 2023 (as a percentage of the number of surveyed organizations using AI)



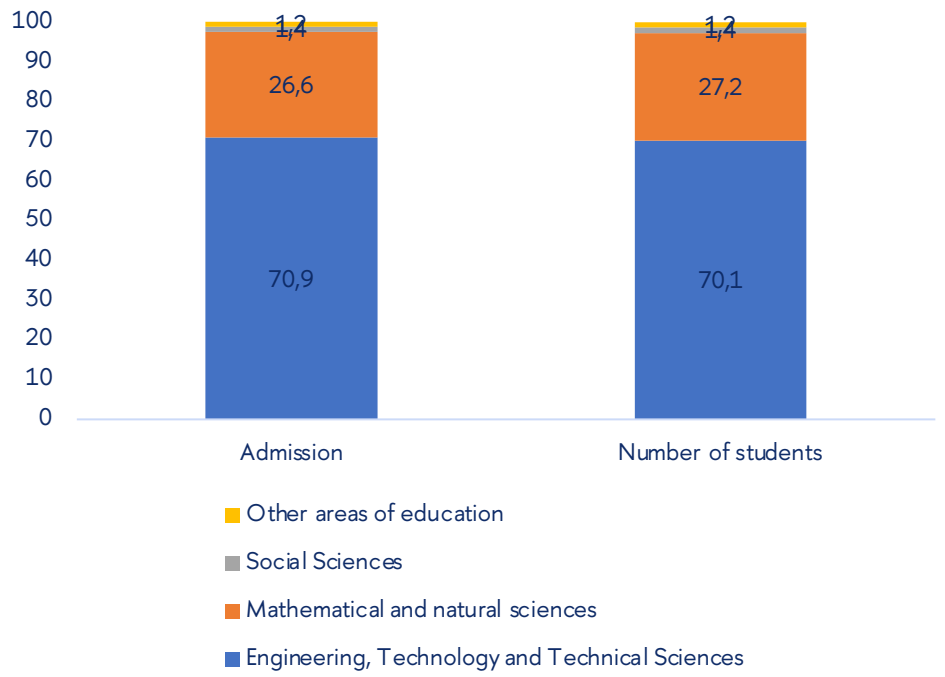
Source: ISSEK, HSE University

The scale of training in the field of AI is growing. The number of graduates in AI-focused higher education programs in 2023 was 3.8 thousand people, in other programs containing an AI module - 64.6 thousand people.

- In 2023, 497 higher education institutions and their branches provided training in the field of AI technologies in bachelor's, specialist's, and master's degree programs, including 166 with a focus on AI (AI profile), 469 with the AI module

- In 2023, 42.3 thousand people (1% of the total number of students) studied AI-oriented programs at Russian universities (AI profile); student admission amounted to 20.7 thousand people (1.6% of total admission), graduation - 3.8 thousand people (0.5% of total graduation).

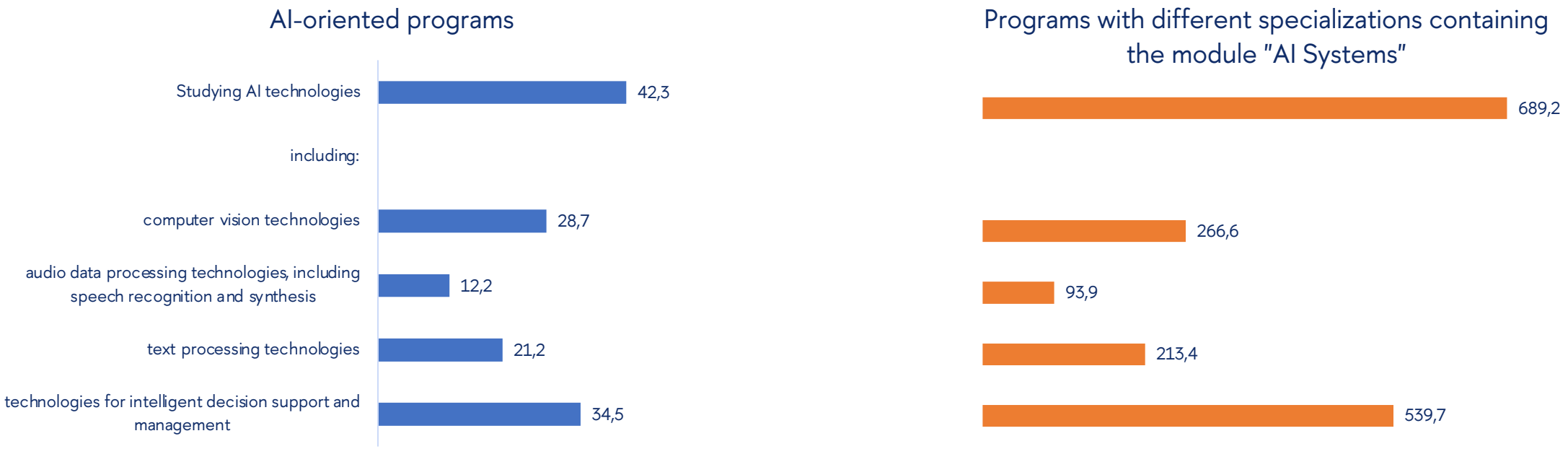
Figure 3 - Structure of admission, number of students in bachelor's, specialist and master's degrees in AI-oriented programs (AI profile) by fields of education: 2023 (percent)



Source: ISSEK, HSE University

Most often, training in working with technologies for intelligent decision support and management is provided, especially within the AI module. In contrast, technologies for processing audio data, including speech recognition and synthesis, are given the least attention.

Number of students: 2023, thousand people



Source: ISSEK, HSE University

Key findings

1. To date, many studies on the impact of AI on the labor market have been conducted, but uniform international statistical standards for measuring this phenomenon have not been developed.
2. In Russia, since 2025, a comprehensive approach to measuring the phenomenon has been introduced, including data from both the labor demand side (employer assessments) and the labor supply side (employee assessments)
3. HSE survey data allows us to assess the development of the phenomenon in Russia in recent years. Two waves of survey have shown the rapid development of the phenomenon in the country and the significant transformational effects of AI technologies on organizations that use such technologies.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