INTRODUCTION

With the development of the Internet, artificial intelligence (AI) has appeared – a computer program and/or robot that begins to compete with humans. The model of AI adaptation to the external environment is called adaptive behavior, which is actively developing and has a direct impact on the labor market. Research on changes in the labor market in the world is conducted by the scientific society "The International Society for Adaptive Behavior" (CALLAWAY, 2012), there are also international conferences "Simulation of Adaptive Behavior (From Animal to Animat)" (INTERNET WORLD STATS, 2017) and the journal "Adaptive Behavior" (MAKEEVA, 2017).

Research on the impact of AI on the labor market is also being conducted in several universities and laboratories:

- Laboratory of Autonomous Robots and Artificial Life at the Institute of Cognitive Sciences and Technologies (Rome, Head - Stefano Nolfi) (PAS 3000: 2015 SMART WORKING, 2015);
- The Neurosciences Institute directed by Gerald Edelman (STELTEN, 2013);
- Artificial Intelligence Laboratory at the University of Zurich (Head - Rolf Pfeifer) (MILGROM; ROBERTS, 1990);
- Laboratories: AnimatLab (Paris, Head - one of the initiators of this direction Jean-Arcady Meyer) (GLOBAL CONNECTIVITY INDEX, 2016);
- ARTS Lab at the National Institute of Economic Research, China (Head - Jia Zhang)
- The Center for the Study of Autonomous Systems at the University of California, San Diego (Head - Yutaka Nishiwaki)
- The Laboratory of Artificial Systems at the University of Paris (Head - Stefano Nolfi)
- The Laboratory of Autonomous Systems at the University of Oxford (Head - Jia Zhang)
- The Laboratory of Machine Learning at the University of Tokyo (Head - Akira Kanazawa)
- The Laboratory of Cognitive Robotics at the University of Paris (Head - Stefano Nolfi)
- The Laboratory of Artificial Systems at the University of California, San Diego (Head - Rolf Pfeifer)
- The Laboratory of Autonomous Systems at the University of Oxford (Head - Yutaka Nishiwaki)
- The Laboratory of Machine Learning at the University of Tokyo (Head - Jia Zhang)
- The Laboratory of Cognitive Robotics at the University of Paris (Head - Stefano Nolfi)

Today, the AI system is present in test mode in China and Japan, the work of the AI system includes the collection and analysis of data on the organization’s personnel, the study of the personal qualities of employees, and the assessment of the personal contribution of each employee to the organization’s activities. The organization successfully uses the collection of this data in the future when analyzing the information of dismissed employees. This analysis allows the organization’s management to receive information in advance about the dismissal of personnel, the reasons for their departure, and to eliminate complaints and dissatisfactions, if possible, to increase staff motivation and reduce staff turnover (KALUGINA; ZAKHAROVA; KRAKHOTKINA, 2017).

According to the forecasts of the Nomura Research Institute, the AI market will grow annually and reach 172.2 billion yen by 2024 (1.55 billion USD dollars) (FREZZO, 2017).
The AI system of the labor market is based on the following principles (MAIMINA; PUZNYA, 2017):

1) Periodic repetition for intuitive capture of the main idea;
2) Enabling associative thinking to increase mental performance;
3) The process of filtering out unnecessary information, highlighting the main idea;
4) A well-designed daily routine.

The use of an AI system allows (MAKARINA, 2018):

- determining the personal capabilities of the organization's employees, finding out their hidden reserves;
- timely conducting career guidance work among the organization's staff;
- developing an individual motivation program for each employee of the organization;
- making personnel changes to increase the efficiency of the entire organization.

Based on the above, we formulate the hypothesis of the study - no education can guarantee employment for life, it is necessary to regularly improve skills, take retraining courses. It is necessary to improve the creative potential of employees in the context of AI development.

METHODS

The subject matter of the study and its unique problems necessitated the use of a combination of several methods. The main method of research was the method of analysis of legal regulations, used in the study of the regulatory framework for the AI development in the whole world and Russia in particular, because improving the regulatory framework for the development of AI will solve several important socio-economic problems, for example, to reduce the projected unemployment rate, indicated above.

The research methodology also includes the goal-setting method, since it allows determining the tasks, principles, and directions of training qualified professional personnel in the context of AI development.

Special attention was paid to general logical methods, namely, the method of deduction, which allowed describing in detail the training programs necessary for employees to successfully realize their labor potential in competition with AI, as well as the method of induction, which contributed to the description of the real specifics of AI activities in the labor market, the method of synthesis, which allowed combining the findings of the study into a single whole, the method of analysis, aimed at studying the subject of research through the prism of AI.

The article also used the method of studying a specific case, which made it possible to identify the cause-and-effect relationships in the labor market and their movement in the era of AI development, and the method of systematic review, based on the principles of labor market regulation, in particular the unemployment rate.

RESULTS

In the context of AI, companies around the world are faced with the problem of retraining personnel. AI is beginning to compete with humans all over the world. We will determine how each country manages to solve the emerging socio-economic problems in the context of AI development. American companies primarily focus on executive career management programs, which include (SENSOR DATA ACTS AS A VIRTUAL MECHANIC FOR DAIMLER TRUCKS, 2014):

- a specific and detailed accounting of potentially vacant management positions;
a flexible system of payment and bonuses for the results of work and prospects for promotion on the career ladder;

drawing up an individual career development plan for each manager, specialist, and employee who is in reserve for promotion, taking into account the capabilities of the company and the business qualities of the employee.

In the programs, foreign companies implement horizontal movements of managers from one division to another, as well as from one branch to another, located in another city, but related to this company. Rotation is the main method of training managers of a wide profile. Every year, in the context of AI development, American companies spend one-third of their budget on retraining and improving the skills of staff at thousands of universities in various training profiles (MAIMINA et al., 2019).

Japanese companies are also concerned about the development of AI, however, all employees are provided with work up to the retirement age (60 years), a guaranteed salary increase is guaranteed with career growth. The Japanese understand the importance of education and the positive effect of professional development of personnel. Retraining of personnel, if it occurs, is rare and often it is economically justified. Remuneration in Japan depends on the financial result of the company and the role of the employee in achieving this financial result, the length of service of the employee in this organization and the total length of service, and, accordingly, on the position held. The existence of such skilled employees plays a large role in the promotion and transfer of technical skills in the Japanese industry (TIMOFEEV; LEBEDINSKAYA, 2016).

Finnish companies have a socially-oriented policy, the development of AI is taken into account in the formation of public policy, identifying first of all the most vulnerable professions, where a person can lose to AI if the company together with the state does not take several socially significant measures in time and allow reducing the projected unemployment rate (SAKHAROVA, 2017).

In Russia, the problem of the widespread introduction of AI in the labor market is still absent, but the problem of employment is not based on the education received, often retraining courses are organized. The training process of retraining itself can be both traditional and remote. In Russia, the most popular retraining courses are Director of Economics and Finance, Commercial Director, entrepreneur, HR Director, Master of Operational Management (BUTENKO et al., 2017).

In Germany, the development of AI in the labor market is taking place, but social guarantees for employees are high, and the following areas are particularly popular:

• training of senior managers, owners of organizations, members of management boards (councils);
• training of senior administrative staff, directors, branch managers;
• training of middle administrative staff, heads of departments, groups;
• training of lower-level managers, site masters, bureau managers, etc.

Germany has created one of the best educational systems in the world. The training is free and universal. The education market in Germany has its characteristics: each educational institution, which is located on the territory of a separate land (administrative unit of Germany), sets its programs, including the necessary components, its admission, and training rules. There is no single training program. Therefore, the risk of losing a job in the conditions of AI development is minimal, although it is possible (STELMAKH, 2017).

Retraining of employees in the context of the development of AI is also available in France, where it is possible to find courses for every taste, and their choice is determined by the very specifics of the country as a world center of fashion, cooking, and art. Le Cordon Bleu Culinary School and Esmond Fashion School, one of the oldest in the world, are considered especially prestigious. It is possible to be taught to create new flavors in the perfume school Institut Superieur International du Parfum, de la Cosmetique et de l’Aromatique Alimentaire. In
addition to the MBA business education familiar to many managers, there is a DESS system in this country (GLOBAL ENTREPRENEURSHIP MONITOR, 2017).

Thus, at present, the problem of the projected growth of unemployment in the context of the development of AI has been recognized worldwide, and ways to solve this problem have been identified. The issue of financing these training programs remains debatable, on the one hand - it is the state as a guarantor of the social rights of citizens, on the other hand - it is companies that can improve the efficiency of their work. In addition, the competitive advantages of a person in comparison with AI are not indicated, the vector of human potential development is not defined, which makes the study of the training of qualified professional personnel in the context of AI development incomplete.

**DISCUSSION**

The human factor plays a special role in the context of AI development, so it is necessary to regularly improve the level of education of employees, including, this will help to reduce not only the projected unemployment rate but also the level of tension in the country. Holding open classes and training with the invitation of famous people will help to unite and coordinate the staff, increase loyalty and the effectiveness of its work, and increase the prestige of the organization itself. Inviting specialists to professional development classes allows gaining practical knowledge in the shortest possible way, and the information of a specialist in his/her field is always complete, detailed, and up-to-date. Experts have already proved the ability to act perfectly in all kinds of economic and social situations. The invitation of famous people to professional development and retraining courses shows the high culture of the organization, the attention of the management to market trends.

In turn, AI can contribute to the disclosure of creative potential and increase the competitiveness of employees, since it will include:

- free online access to programs – the employee can improve their skills on the job, the employee can be at a considerable distance from the tutor, including in different cities and countries;
- flexibility of training – the employee chooses the duration of training based on their capabilities, fully adapting the entire training process to their capabilities and needs, access to training materials is carried out at any time of the day;
- improving the economic efficiency of the provision of educational services by reducing the cost of organizing professional development programs.
- manufacturability – training with the use of modern software and hardware allows making visual information bright and dynamic.

Therewith, the employees themselves can act as teachers in these courses, the following can be distinguished among the main requirements for moderators and tutors:

- kindness and warmth, a combination of impartiality with the ability to empathize;
- indulgence, understanding of the students’ goals;
- encouraging each student to try to understand the topic under discussion;
- excluding the possibility of misinterpretation of the statements of other students, the moderator should summarize out loud what they have said and clarify whether their thought is correctly expressed.
- encouragement to participate in the conversation, greeting friendly communication between the participants of the educational process.
- showing flexibility in case of topics and distractions from the original plan during the discussion.
- good reaction, the moderator is quite sensitive, has a high intellectual and emotional level.
The program itself to improve the competitiveness of employees in the context of the AI development will include:

- selection of relevant topics for students and their detailed study;
- statement of the program’s goal;
- definition of specific private practical tasks and principles of program construction;
- identification and selection of scientific knowledge and best practices, based on which practical tasks are defined;
- structuring the knowledge included in the program content;
- assessment of the compliance of the program elements with each other and making the necessary adjustments;
- registration of the text of the program of retraining or advanced training;
- definition of the tasks of the AI system in the retraining of personnel;
- selection of AI system resources;
- defining the requirements for moderators and tutors;
- conducting a review contest of moderators and tutors;
- adjustment of the program taking into account the means of the AI system;
- testing the program in practice;
- implementation of the professional development program, taking into account the means of the AI system.

Based on the above, we can identify the main tasks facing AI, solving which can increase the competitiveness of employees in the labor market:

- individualization in the formation of a package of studied disciplines, which will increase the assimilation of the material passed;
- determination of the training schedule taking into account the capabilities of the employee and his/her physiological characteristics, regular monitoring of the material passed and, if necessary, return to it at all stages of training;
- opportunities for mutual assistance among employees in the process of professional development, which will increase the corporate spirit, reduce the level of conflict in the team, and improve the psychological climate in the team;
- the possibility of combining training programs, disciplines from different advanced training courses, depending on the wishes of the employer and the employee, taking into account the specific features of the company’s industry;
- opportunities for remote exchange of experience of employees located in different countries, which minimizes the costs of companies when exchanging experience, which will ultimately expand the geography of companies and increase their competitiveness on the world stage;
- the procedure for evaluating the results achieved by students will become more transparent and complete, and the result obtained during training will be more reliable;
- virtualization, applied by AI, will make the learning process more informative and interesting, will help to reveal the talents of employees, determine the most suitable positions for them in companies, thereby increasing the efficiency and competitiveness of both employees and the company as a whole;
- the availability of complete and reliable information about each of the employees will allow determining the most effective system of personnel motivation, determining the
priority material and non-material incentives for each employee, and therefore human resource management will become more effective in the company itself;

- optimization of the education system with the help of AI will allow more quickly achieving the goals of both employees and the company as a whole, determining the optimal ratio of resources spent and income received and reducing the payback period of companies’ investments in employee training.

Therefore, the AI used to fulfill the potential of employees in the process of their retraining will include:

- means of visualization of the obtained learning result to increase the motivation of students;
- means of visualization that help improve the assimilation of information in the learning process;
- a variety of electronic resources and programs that allow optimally organizing the learning process and creating comfortable conditions for students;
- building the logic of training depending on the preferences of the employee and the employer, choosing the most effective ways of training and conducting active forms of training, depending on the psychological and physiological characteristics of each employee, which will eventually make the retraining process unique;
- based on the completed training, it is possible to form teams among employees who will be able to work most effectively in the company, reducing the level of conflict, minimizing risks and the level of uncertainty in the internal environment of the company;
- building a personal career development strategy for each employee, taking into account their capabilities and abilities, which will allow them to maximize the creative potential of employees and determine the most appropriate position for each employee;
- training with the help of AI will increase the creativity of the company’s employees, which will allow maximizing the untapped human potential, which is especially important in the conditions of competition, both internal and external;
- it will improve the quality of employees’ working time, reveal growth reserves, identify potential and find ways to unlock it with minimal costs;
- to provide each employee with a workplace depending on their knowledge, skills, abilities, opportunities, and desires, thus each employee of the company will be able to raise self-esteem, which is also important.

**CONCLUSION**

Summing up, we note that AI forces a person to improve, allows unlocking the potential of employees, finding the most suitable job in the labor market, having a guaranteed workplace with the possibility of career growth and wages. AI has not only a negative impact on the labor market but also allows improving the work of a person, finding a job following desires and capabilities, maximizing creative potential and career growth reserves. All this will allow determining the personal capabilities of the company’s employees, finding out their hidden reserves; timely conducting career guidance work among the organization’s staff; developing an individual motivation program for each employee of the organization; allowing one to carry out personnel changes to increase the efficiency of the entire organization.

Combining the research results, we can assume that the situation will develop in several directions:

1. AI will help develop the creative potential of employees by building an individual training plan for each employee, taking into account their characteristics. The priority form of training
will be a mixed form of training, including both distance learning and work at a specific workplace. AI will also allow forming a friendly team, reducing the level of conflict in the team, revealing more fully the creative potential of each employee, increasing creativity in the company, and therefore making the company and employees more competitive in the market, reducing the level of vulnerability.

2. AI will increase the unemployment rate, replace jobs with machines, increase the level of tension, lead to increased conflicts in companies, and there is a high risk of bankruptcy of companies that do not use AI in production.

The first path of development seems to be the priority one, but if the second path is chosen, then in the end it will still go to the first path of development since no AI can absorb the entire creative potential of human development. After all, each person is unique and AI should contribute to more complete disclosure of the creative capabilities of each person, as a result of the competition between AI and humans, the winner will be the person who has created AI for effective work, and not vice versa. Among the prospects for the development of this study, the following can be distinguished:

- identification of the most vulnerable sectors of the company's activities to AI and ways to reduce this risk;
- identification of ways to reduce social tension in the context of the development of AI and the development of measures of state support for the population, taking into account the projected unemployment rate.

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Training of qualified professional personnel in the context of artificial intelligence development

Capacitação de profissionais qualificados no contexto de desenvolvimento de inteligência artificial

Formación de personal profesional cualificado en el contexto del desarrollo de la inteligencia artificial

Resumo
O objetivo desta pesquisa foi comprovar as perspectivas de requalificação de programas para cidadãos no contexto do desenvolvimento da inteligência artificial. Os principais métodos de estudo do problema foram uma revisão da experiência internacional de programas de retreinamento para cidadãos no contexto do desenvolvimento da inteligência artificial e uma avaliação das possibilidades de sua adaptação à prática econômica russa. Foram apresentados argumentos que convencem a necessidade de desenvolver programas de requalificação dos cidadãos no contexto do desenvolvimento da inteligência artificial para melhorar o nível e a qualidade de vida da população. O artigo resume a experiência internacional no desenvolvimento de programas de requalificação para cidadãos no contexto do desenvolvimento da inteligência artificial.

Keywords: Mercado de trabalho. Inteligência artificial. Programas avançados de treinamento. Reciclagem. Economia digital.

Abstract
The purpose of this research was to substantiate the prospects of retraining programs for citizens in the context of artificial intelligence development. The main methods of studying the problem were a review of the international experience of retraining programs for citizens in the context of artificial intelligence development and an assessment of the possibilities of its adaptation to Russian economic practice. Arguments have been presented that convince the need to develop programs for retraining citizens in the context of artificial intelligence development to improve the level and quality of life of the population. The article summarizes the international experience in the development of retraining programs for citizens in the context of artificial intelligence development.

Keywords: Labor market. Artificial intelligence. Advanced training programs. Retraining. Digital economy.

Resumen
El propósito de esta investigación fue corroborar las perspectivas de programas de reciclaje para los ciudadanos en el contexto del desarrollo de la inteligencia artificial. Los principales métodos para estudiar el problema fueron una revisión de la experiencia internacional de los programas de reciclaje para los ciudadanos en el contexto del desarrollo de la inteligencia artificial y una evaluación de las posibilidades de su adaptación a la práctica económica rusa. Se han presentado argumentos que convencen de la necesidad de desarrollar programas de reciclaje de los ciudadanos en el contexto del desarrollo de la inteligencia artificial para mejorar el nivel y la calidad de vida de la población. El artículo resume la experiencia internacional en el desarrollo de programas de reciclaje para ciudadanos en el contexto del desarrollo de la inteligencia artificial.

Palabras-clave: Mercado de trabajo. Inteligencia artificial. Programas de formación avanzada. Reentrenamiento. Economía digital.