About the attitude towards artificial intelligence technologies

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Abstract. Artificial intelligence technologies are capable of solving complex problems, ensuring the technical and economic development of society. At the same time, like any significant innovation, they require close study from the point of view of their integration into the space of human society. This direction is little studied and requires scientific analysis. The article summarizes the concept of artificial intelligence, lists the technologies of artificial intelligence, identifies the main problems associated with the spread of technology in our country. The main content of the study is the analysis of the results of an electronic survey on the attitude of a modern person to the introduction of artificial intelligence technologies, his readiness to accept changes associated with this technology. The respondents see prospects in the use of artificial intelligence technologies and have a positive attitude towards their use, even if they do not always understand the essence of these technologies. Also, they are not particularly afraid of losing their jobs because of them, since the introduction of these technologies does not occur rapidly and everywhere. At the same time, they are in no hurry to improve their qualifications or acquire new professional skills related to these technologies. Serious work is needed not only to develop and disseminate the technologies themselves, but also to study and form the readiness of society and business for new technological solutions. Keywords: artificial intelligence, technology, software, cognitive functions, Internet survey.

1 Introduction

Under the technology of artificial intelligence (TAI) understand the technology, using software capable of recognizing speech and visual objects, to perform complex logical operations and analytical calculations and make decisions. In other words, basis of artificial intelligence (AI) as the computer technology are software tools capable of performing cognitive functions like a human: process natural language, recognize objects, accumulate knowledge, perform logical reasoning, draw conclusions, to perform reasonable actions, train.

The main areas of artificial intelligence (AI) include: machine learning, cognitive calculating, computer vision, processing of natural language. The essence of TAI is to use

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large amounts of data, fast and iterative processing of them, the application of intelligent algorithms that allow programs to automatically be trained on the basis of patterns and signs contained in the data. The functioning of AI is provided by technologies such as graphics processors, advanced data processing algorithms, Internet of Things (IoT), application programming interfaces (APIs).

AI is conventionally divided into two classes - strong AI (AGI, comparable to human) and weak (applied) AI. The term strong AI was offered in 1980 by the philosopher John Searle of Berkeley University of California. The ultimate goal of strong AI is to produce a machine whose overall intellectual ability is indistinguishable from a human one [1]. Applied AI, also known as advanced information processing, aims to produce commercially viable "smart" systems [1]. Currently, we are surrounded by weak AI system that solve the particular tasks [2]. They are just systems, the gradual development of which brings the creation of a strong AI closer [3]. Cognitive modeling is an important tool for studying AI, which uses computers to test theories about how the human mind works [1].

As a scientific direction, AI has gone through several stages of development [4]. Each stage is associated with special objects of study, methods, applications. Currently, there is a transition from the computing era to the cognitive era [3] and scientists associate great importance in it with AI. The peculiarity of the present stage, in our opinion, is the practical relevance of TAI and immediate application of technologies in life and business: recognition systems [5], logistics [6], marketing [7], service systems [8], security systems [9], decision-making systems [10], system of the railway transport control in a real-time mode [11] and others. Such rapid development and implementation of AI, on the one hand, can lead to significant and rapid improvement in human well-being. On the other hand, there are good reasons to believe that this can also lead to disastrous consequences. The problem lies in the lack of knowledge of how it would be possible to develop highly intelligent technologies for the safe achievement of person's realistic goals with their help [12]. Unfortunately, many do not see this problem or do not consider it a priority, which is due to the lack of strong AI or the lack of widespread practical application of TAI [12]. But many experts consider AI as an innovative technology that ensures the development of technology, economy and business in Russia [11, 13], therefore, the problem of development, implementation, security, influence of TAI requires mandatory study.

Continuously growing proportion of organizations that implement AI technologies: speech recognition; accelerators of AI based on the graphic processors used to create AI systems; AI means of dialog, their spread is inspired by the success of virtual assistants like Amazon Alexa, Google Assistant; augmented intelligence; "edge" AI; automated data markup; "explainable" AI (an artificial intelligence system, the solutions of which people can explain) [14]. According to experts, not all new TAI have a clear application and are able to benefit business. The most popular are following technologies include the following.

Means of augmented intelligence - automation means, capable of increasing productivity of human brainwork due to the organization of partnership "human – AI". In this partnership, on the one hand, AI will help a person reduce the amount of routine work and reduce the number of possible mistakes. On the other hand, a person reduces the risk linked with automated decision-making [14, 10].

Currently, chat bots have changed the customer service process. Chat bots are working with systems of speech recognition. Using text or voice, they answer the standard questions of clients according to the scenario drawn up on the basis of the living experience of the operator. They allow the client to receive additional or reference information, bypassing interaction with an unfamiliar and, sometimes, complex interface.

With the advent of big data connected wide use of machine learning (analysis of structures and patterns, forming of classifier algorithm, image classification, object

recognition), allowing on the basis of neural networks to solve detection tasks that attend in the data. Deep analysis of big data with the help of neural networks with a variety of hidden levels – deep learning allows to achieve high accuracy in solving the problems of recognition. These include a personalization of customer service [5], disease diagnostics, scam detection, predicting failures of equipment pieces [8], game analytics [12, 15], the study of galaxies evolution, calculating of functions of quantum waves function, discovering new chemical compounds [16], proof of mathematical theorems, unmanned vehicle [4] and others.

Today, a special interest of users associated with automated machine learning technologists; business applications with built-in AI mechanisms; AI platforms, which can be granted in the form of services by corresponding cloud services. Until recently, analytics with built-in AI technologies were considered as the most "intelligent ". Today functions of AI are integrated into existing products, developers of enterprise applications, for example, ERP systems, CRM, personnel management and office software insert into them means of AI and build AI platforms.

2 Materials and research methods

To get answers to some questions related to the prospects of the development and implementation of TAI in human life and activities, an Internet survey was conducted, in which 101 people took part. To compose a social portrait of a respondents group, we will present some diagrams.

The average age of respondents is 23 years, the minimum age is 19 years, the maximum is 27 years. The average salary of respondents - 8778 rubles, maximum - 75 000. The most detected salary is 25,000 rubles. There is a strong relationship between the age and salary of the respondents, the correlation coefficient is greater than 0.7.

The gender ratio of the respondents is shown in Figure 1: men make up 65%, women - 35%.

The majority (73,3%) of the respondents are residents of Rostov-on-Don; there are singly residents of such cities as Moscow, St. Petersburg, Taganrog and others in the group (figure 2).

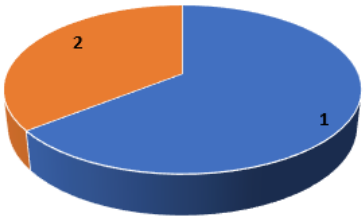


Fig. 1. Gender ratio of respondents.

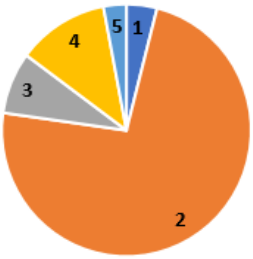
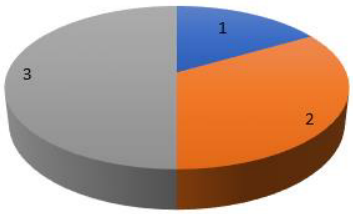


Fig. 2. Ratio of respondents by city of residence.

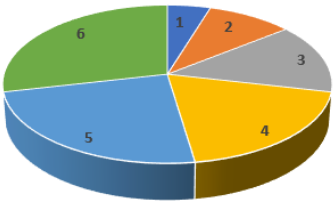
In terms of the education level, the respondents are divided into three groups: secondary vocational education; higher education - bachelor's degree; higher education - specialty, master's degree. The ratio by education level is shown in figure 3: 10% of respondents have secondary vocational education; 90% - higher education.

Among the respondents, the following groups can be distinguished, whose members differ in their specialties: technical (45%); economics (24%); juristic (11%); humanitarian (9%); construction (8%); medical (3%) (Figure 4).



1- secondary vocational education
2- higher education - bachelor's degree
3- higher education - specialty, master's degree

Fig. 3. Ratio of respondents by level of education.

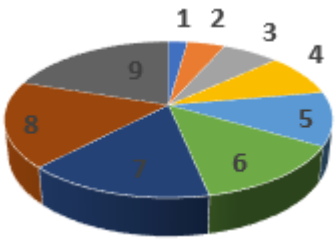


1-humanitarian (including theatrical and linguistic)
2-medical
3-building
4-technical
5-economic
6-juristic

Fig. 4. Ratio of respondents by specialty received.

Among those interviewed are the following groups which differ by the area of activity: the sphere of activities related to information technology (34%); technical sphere (13%); economic sphere (11%); service sector (9%); sales area (7%); juristic sphere (7%)%; creative sphere (6%); medical sphere (1%) (Figure 5).

56% of respondents are satisfied in terms of salary and career opportunities with their work, and 44% are not (figure 6). The respondents who have received a construction and technical education are more satisfied with a job than not. The respondents who have received humanitarian, economic, juristic and medical education, are more not satisfied by their work then satisfied. The respondents in the creative sphere and in the sphere of information technology are practically satisfied with the work.



1-information technology
2-medical
3-area of sales
4-service sector
5-creative
6-technical
7-economic
8-juristic
9-job missing

Fig. 5. The ratio of respondents by field of activity.

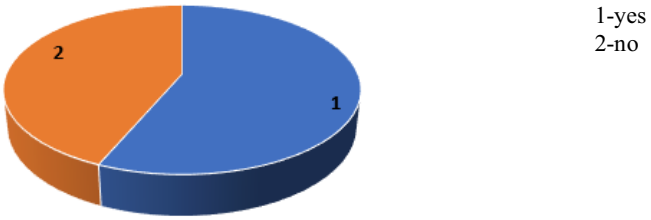


Fig. 6. Ratio of respondents by job satisfaction.

3 Research results

Let's analyze the survey results related to the impact of AI technologies.

First, note that the topic of AI is complex and relatively new. According to a survey conducted by All-Russian Center for the Study of Public Opinion (ACSPO) in conjunction with the Analytical Center under the Russian government, only 29% of Russians understand what AI is (1,600 people took part in the survey). At the same time, 75% of Russians have heard about AI technologies, and 38% were able to indicate the scope of its application [17]. In our survey young people have participated, 90% of which have or receiving higher education. It can be assumed that the respondents belong to the category that understands what TAI is and where it is applied.

Most of the respondents (77%) believe that TAI development can have a positive impact on labor productivity (figure 7). Higher education respondents more likely believe that AI technologies have a positive impact on labor productivity. Respondents of technical, economic, juristic and medical spheres and sales sphere largely believe that AI technology has a positive effect on productivity. But respondents working in the field of services and creative spheres do not think so.

53% of the respondents believe that TAI cannot be used to fulfill some of their mandate on the workplace, and 47% - that it can be used (figure 8). Sales, technical, economic and juristic respondents are more likely to use TAI to fulfill their mandate on the workplace.

Despite the fact that only a third of the Russians surveyed know what AI is, more than half of them are ready to apply it in everyday life [17].

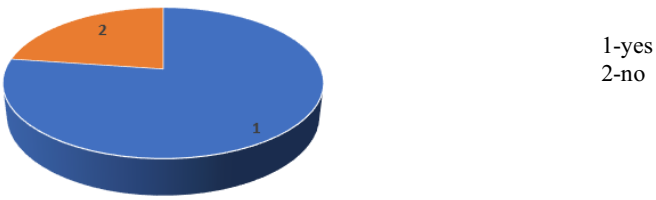


Fig. 7. Ratio of respondents regarding their opinion on the positive impact of TAI on labor productivity.

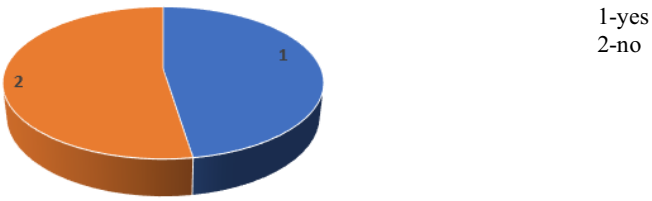


Fig. 8. Correlation of respondents regarding the opinion about the possibility of using TAI to fulfill part of their mandates.

Most of the respondents (65%) believe that TAI could cope with work responsibilities better than human (see figure 9). IT respondents, sales and service respondents, technical, economic and juristic are more likely to believe that AI can do better than humans at work. Respondents receiving humanitarian and medical education, increasingly believe that AI technologies can't cope with work responsibilities better than human. Almost three times more men than women believe that AI technologies can do better at work than humans.

According to another survey, more than half of the most cited computer science researchers believe there is a more than 50% chance of having a high-level machine intelligence by 2050 that can perform most human functions as well as the average person. And the chance that this will happen by 2024 was noted by more than 10% of respondents [12]. Scientists are more realistic about the creation of a perfect intelligent machine that can replace humans.

Also, the majority of respondents (81%) notes that society more likely benefits from a more rapid technology development than loses (figure 10). The majority of Russians, despite their low knowledge of TAI, have a positive or neutral attitude to the development and implementation of TAI: 48% expressed admiration, interest and confidence in this technology; 31% showed a neutral attitude; 7% surprised and 12% expressed a negative attitude [17].

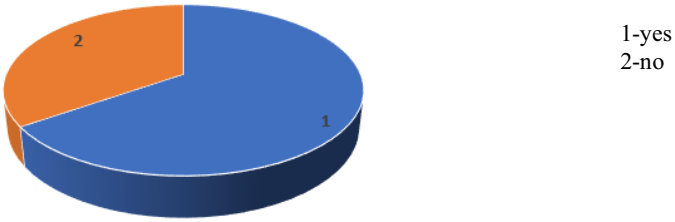


Fig. 9. The ratio of respondents by the opinion that TAI can cope with work duties better than a human.

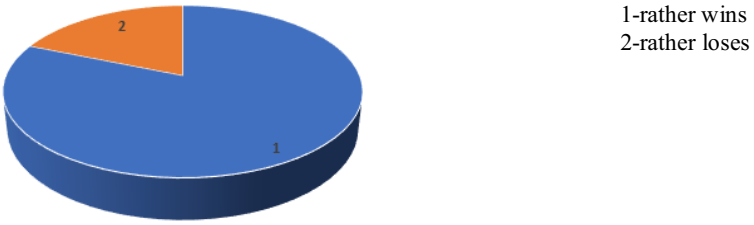


Fig. 10. The ratio of respondents by the opinion that society benefits rather than loses from the rapid development of technologies.

Only 26% of the respondents are afraid of losing their jobs due to the development of TAI. Independently of city living there are more participants who are not afraid of losing their jobs because of TAI. The respondents in the medical, creative, technical spheres and whose field of activity is related to information technology are not afraid of losing their jobs due to the development of TAI. Respondents in sales, economical and juristic spheres are very afraid of losing their jobs due to the development of AI technologies. For respondents in these areas, the observed response rate is "Yes" to the question "Are you afraid that due to the development of AI you may lose your job?" about 3 times more than expected.

68% of Russians surveyed are not afraid that TAI will leave them unemployed. The negative attitude towards TAI is mainly due to the possibility of technical failures (31%) [17].

Only 31% of respondents are ready to get a new more popular education/learn new skills, if there will be any fear of losing their jobs. The majority of respondents are characterized by a lack of readiness to receive a new, more popular education/acquire new skills, which practically does not depend on their basic education.

Among the respondents who are satisfied with their work, there are 13 times more respondents who are not ready to receive a new, more in-demand education/acquire new skills.

Among the respondents who are not satisfied with their work, there are one and a half times more respondents who are ready to receive a new education that is more in-demand/acquire new skills. At the same time, the observed frequency of respondents who are ready for this is twice the expected one.

Women, more likely than men, are not ready to receive new education/skills that are more in demand.

Such an optimistic attitude towards the issue of losing a job and gaining new professional skills is probably due to the delayed introduction of AI into human activities.

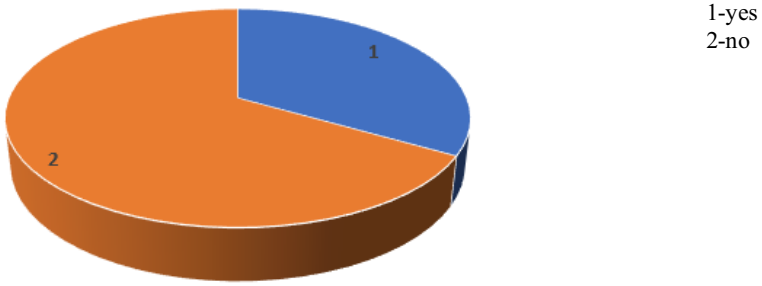


Fig. 11. Ratio of respondents regarding fears of losing their jobs due to the development of TAI.

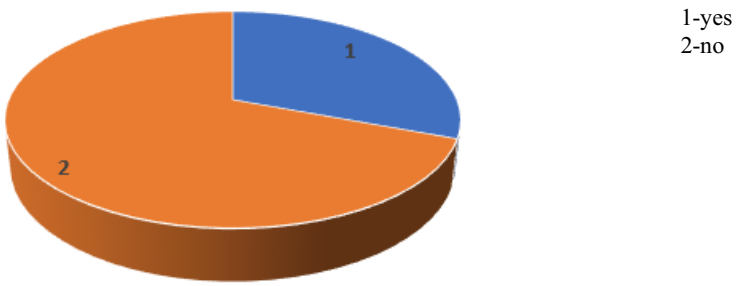


Fig. 12. Ratio of respondents regarding their willingness to get a new, more in-demand education/acquire new skills.

For the majority is clear the possibility of damaging social consequences appearing of AI introduction which could take over the work previously done by humans. If the economy can't quickly enough create new jobs for the people, who were replaced by machines, unemployment will increase and the salary may be reduced [12]. These results can be avoided through public policy and planning.

Only 40% of respondents believe that it is necessary to regulate TAI with law in order to avoid jobs loosing because of TAI. Approximately one and a half times more respondents, both male and female, who don't think it is necessary to regulate the development of TAI by the law.

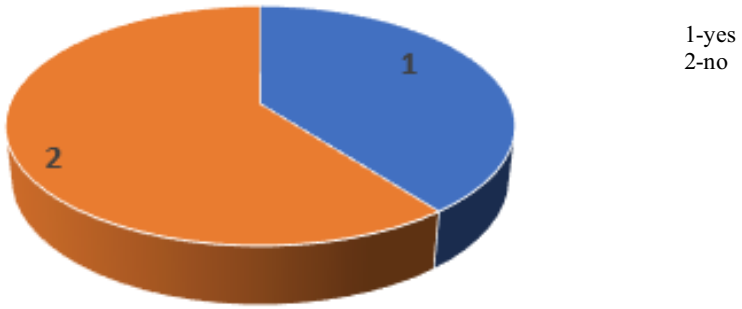


Fig. 13. The ratio of respondents regarding the opinion on the need for legislative regulation of the development of TII.

4 Conclusions

As we can see, AI technologies are capable of solving complex problems, ensuring the technical and economic development of society. At the same time, like any significant innovation, TAI requires close study in order to timely solve the problems of AI integrating into the space of human society. The problem is that there is little knowledge of how highly intelligent technologies could be developed for the safe achievement of realistic goals by humans. As part of just such a task the attitude of people to TAI was analyzed and the following results were obtained:

- Most of the respondents (77%) believe that the development of TAI can have a positive effect on labor productivity. Higher education respondents are more likely to believe that AI technologies have a positive impact on labor productivity. The respondents working in the service and creative sectors, unlike other respondents, do not think so.
- 53% of respondents believe that TAI can't be used to fulfill part of their mandates on the workplace, and 47% - that it is possible. Sales, technical, economic and juristic respondents are more likely to use TAI to fulfill their mandate in the workplace.
- Most of the respondents (65%) believe that TAI can cope with work duties better than a person. There are nearly three times more men than women who believe that AI technology can do a job better than a human. The respondents who received humanitarian and medical education are more likely to believe that AI technologies cannot cope with work duties better than humans.
- Big part of respondents (81%) notes that the society soon benefit from the rapid development of technology, rather than loose.
- Only 26% of respondents are afraid of losing their jobs due to the development of TAI. Regardless of the residence city, there are more respondents who are not afraid of losing their jobs due to the development of TAI. Sales, economic and juristic respondents are very worried about losing their jobs due to the development of AI technologies. For respondents in these areas, the observed response rate «Yes» to the question «Are you afraid that due to the development of AI you may lose your job? » about 3 times greater than expected.
- Only 31% of the respondents are ready to receive a new, more in-demand education/acquire new skills if they have fears of losing their job. The majority of respondents are characterized by a lack of readiness to receive a new education, which practically does not depend on their basic education. Women, to a greater extent than men, are not ready to acquire new education/acquire new skills. Among the respondents who are not satisfied with their work, there are one and a half times more respondents who are ready to receive a new, more in-demand education/acquire new skills. Among the respondents

who are satisfied with their work, there are 13 times more respondents who are not ready to get a new education.

- Only 40% of the respondents believe that it is necessary to legislatively regulate the development of TAI in order to prevent people from losing jobs due to the development of TAI. Approximately one and a half times more respondents, both male and female, do not consider it necessary to legislatively regulate the development of TAI.

Such results are associated with the level of development and implementation of AI, which exists in our country, and the problems associated with AI. The latter include an unprocessed conceptual apparatus [18]; absence of technical and legal regulation of AI technology development and launch [19]; "Russian market of AI is at an early stage of development" [13], which leads to a lack of understanding among the population, "how exactly the introduction of technology will affect everyday life " and "business is not ready to use AI everywhere - more than 40% of companies in Russia have refused introduction of this technology" [17]; the lack of a clear understanding among researchers of the need for an active security issues study associated with the introduction of TAI [12, 20] and the integration of AI into the space of human society [18].

Despite this, participants have a positive attitude towards TAI and appreciate them. They are not particularly afraid of losing their jobs because of TAI, since the introduction of these technologies does not occur rapidly and everywhere. Also, they do not consider the legislative regulation of TAI development to be important and are in no hurry to acquire new professional skills because of fear that they will be replaced by smart machines.

TAI are innovative technologies capable of ensuring the development of technology, economy and business in Russia [11, 13]. That is why it is necessary to lead serious work not only for the development and dissemination of the technologies themselves, but also for research and development of society and business readiness to new technological solutions.

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