

The Impact of Digital Technologies and Artificial Intelligence on the Quality of Life of the Population in Russia

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Abstract: Digital technologies are widely used in our lives, but they have a mixed impact on it. The purpose of the publication is to identify areas of positive and negative impact of digital technologies on the quality of life of the population, its features in Russia; to assess the impact of artificial intelligence on the quality of life of the population based on indicators of life expectancy. Based on the analysis of literary sources and empirical observations of the results of the use of digital technologies in organizations in Russia, the authors have formulated the following areas of positive impact of digital transformation on the quality of life of the population: significant reduction of time spent on various payment transactions; access of individuals to information about state services in the Russian Federation and the possibility of obtaining them remotely; support for people with disabilities through the use of touch sensors and digital applications, bioprostheses; monitoring the state of the industrial environment; the use of industrial robots to reduce the negative impact of industrial hazards; employment opportunities in remote regions of the country; opportunities for distance learning; the use of Smart Home systems. But the use of digital technologies can create threats to life and health, information and financial threats. The projected values of life expectancy of the population in Russia calculated by the authors indicate that in the period up to 2026, under the influence of digital technologies and artificial intelligence, life expectancy will increase. But the use of digital technologies can create threats to life and health, information and financial threats. The projected values of the life expectancy of the population in Russia, which were calculated by the authors, indicate that in the period up to 2026, under the influence of digital technologies and artificial intelligence, life expectancy will increase.

Keywords: artificial intelligence, Quality of Life, Digital Technologies.

1. Introduction

The digital space has taken over almost all areas of people's lives: we communicate on social networks, instantly find the necessary information and pay for purchases without leaving home. Organizations make transactions and resolve various issues remotely. All this affects the quality of life. In recent years, artificial intelligence has also had an impact on our lives. In organizations, robots take on the most complex functions of assembling products, identifying quality problems, recognizing emergency situations and solving them; in everyday life, artificial intelligence helps in cleaning the house, regulates the indoor climate and lighting, and helps in cooking. Computer vision and image recognition technologies make it possible to identify objects, analyze their condition, and are widely used in the field of security and other fields. Artificial intelligence speech technologies are able to transform voice into text and vice versa, significantly improving the quality of life of people with visual disabilities; they help to translate texts, solving communication problems for people who do not speak foreign languages. Machine learning technologies are capable of applying methods and algorithms that allow computer systems to automatically learn from data and make predictions or make decisions without a clearly formulated program assignment. Digital technologies and artificial intelligence technologies affect our lives ambiguously. On the one hand, thanks to them, it became possible to receive information from a large number of sources, store it and process it; to perform routine, routine tasks and functions in various fields with their help; to increase labor productivity. They can stimulate economic growth, apply innovations, and ultimately have a positive impact on people's lives.

Unfortunately, there are also negative trends affecting the quality of human life. In 2018, scientists studied the movements of tweets - short messages visible to everyone who communicates with a user on a social network. They examined 1,200 tweets and came to the conclusion that those that contained fake news were six times more popular than those that were true [1, pp. 3-14]. This indicates that the risk of misinformation in the Internet space is quite high. The use of social media also raises certain concerns. As of December 2024, the monthly reach of the Russian VKontakte network was almost 92 million users. Table 1 shows data on the use of Internet resources in Russia:



Table 1. Popular Internet resources in Russia in 2025.

№	Resource	Monthly coverage (thousand people)	Monthly coverage (%) of the population	Average daily monthly coverage (% of the population)
1	Yandex	102340,9	83,2	58
2	Google	101036	82,1	52,2
3	Whatsapp	97459,7	79,2	67,7
4	Vkontakte	93825,7	76,3	47,8

Source: compiled from the materials of [2].

Thus, social networks cover a large part of the population of our country. This trend is typical not only for Russia. At the same time, the constant use of social networks causes problems for users. According to IPSOS research in countries around the world, new technologies solve various problems and improve the quality of life. 76% of respondents from Russia, 63% from the USA, and 80% from China think so. At the same time, the majority of Russian respondents believe that digital technologies will improve the quality of life. At the same time, a certain part of the population of our country is inclined to believe that artificial intelligence and information technologies spoil life and are harmful. In Russia, 31% of respondents came to this conclusion [3; 4, pp. 91-92]. Many works by Russian and foreign researchers have been devoted to the impact of digitalization and artificial intelligence on the quality of life. Researchers from different countries note that digital technologies and artificial intelligence undoubtedly have a strong impact on economic life and the quality of life of the population. At the same time, various aspects of influence are being investigated. Thus, in the works of V.E. Yanchenko, it is shown that the scale of distribution and accessibility of modern digital technologies correct the idea of a decent quality of life and enrich the corresponding set of indicators characterizing it (accessibility of digital goods and services, security and quality of Internet connection, development and accessibility of electronic services of public services, etc.), it is concluded that It is shown that the standard correlation analysis of the digital economy and society index and the quality of life index in 27 EU countries showed a positive medium-strength relationship (correlation coefficient = 0.67) [5].

Some authors note that there is a close relationship between the shadow economy and the quality of life of the population: the larger the shadow economy of a country, the lower the quality of life of the population and the higher the poverty rate [6, p. 227]. At the same time, it is emphasized that digital transformation improves the quality of life and helps to reduce the scale of the shadow economy, as the economy becomes more "transparent" and controlled by the state. E.V. Samorodova's publications revealed a high degree of dependence of the level of digitalization of the country's economy on the state of citizens' human capital [7, pp. 25-28;]: the high level of citizens' human capital creates conditions for the development and successful implementation of digital technologies. In our opinion, the relationship between the level of development of digital technologies and the level of human capital is two-sided: The level of digitalization in modern conditions also determines educational opportunities, including in a remote format; affects employment opportunities, including not in the region of residence of the employee; allows you to effectively organize teamwork for employees of the organization working in mobile or remote workplaces, which contributes to the formation and development of professional competencies. Already today, artificial intelligence technologies play an important role in increasing the productivity of human resources in the processes of finding, hiring and retaining employees [8]. Z.M. Ishnazarova, D.U. Ishnazarov and I.A. Sitnova cite data from the Global Institute of Management that in the next 20 years there will be a digital revolution that will lead to automation of 50% of all labor processes [9, p. 758]. A.S. Smetanin provides data according to which in 2023 Russia was included in the list of thirty countries in the world, whose enterprises are most actively using artificial intelligence and big data technologies. He believes that in 2031, almost all business structures in Russia will use artificial intelligence [10, 11, p. 531]. This will have a positive impact not only on the management system of organizations, but also on the profits of enterprises, increasing the volume of gross domestic product (GDP). Consequently, GDP per capita will grow and, as a result, the level of well-being of citizens and the quality of life will increase.

Many Russian and foreign authors say that artificial intelligence systems are already widely used in industry, finance, trade, education and medicine, and the effectiveness of decisions made by artificial intelligence is higher compared to traditional decisions made by humans [12; 13, 14; 15; 16]. For example, digitalization has a positive impact on food security by increasing food supply and reducing food insecurity [17]. Artificial intelligence technologies contribute to the creation of "smart" homes and cities [18]. The trends in the development of digital technologies and artificial intelligence systems and the expansion of their impact on the quality of life of the population are characteristic not only for Russia. Artificial intelligence and digital technologies are actively developing in the economies of India [19; 20], Finland [21], and Germany [22]. But V.P. Nevmyvako says in his works that in recent years the complexity of tasks assigned to artificial intelligence has been growing, while new challenges and threats have emerged [23, pp. 331-332]. A.V. Mukhacheva notes that digital transformation also carries negative effects and risks [24, pp. 859-884]. Researchers also assess society's

readiness for digitalization ambiguously [8, pp. 157-179], while the ability to use digital technologies and a positive attitude towards them significantly affect people's quality of life.

The purpose of the publication is to identify the main directions of the positive and negative impact of digital technologies and artificial intelligence technologies on the quality of life of the population, as well as the features of this impact on the quality of life of the population in Russia; to assess the impact of digital technologies and artificial intelligence on the quality of life of the population based on life expectancy indicators.

2. Methodology and analysis

The analysis of domestic and foreign literary sources, as well as empirical observations of the results of the use of digital technologies in various organizations in Russia, allowed us to formulate the following main directions of the positive impact of digital transformation and artificial intelligence technologies on the quality of life of the population:

- a significant reduction in time spent on performing various payment operations (for example, ordering and paying for goods and services) through the use of the "Fast Payment System", a service of the Bank of Russia that allows you to transfer money to other people, pay for goods and services, receive payments from organizations or online banking services such as "Sberbank Online", which allows you to conduct banking transactions using a computer or mobile phone and receive information about your finances from anywhere in the world in real time;
- informing and accessing individuals and legal entities to information about state and municipal services in the Russian Federation, state control and supervision functions, services of state and municipal institutions, as well as the possibility of obtaining these services remotely through the use of the Gosuslugi Internet information portal (for example, ordering a passport, issuing a visa, make an appointment with a doctor, apply for child benefits and other social benefits);
- support for people with disabilities through the use of touch sensors and digital applications for visually impaired people (for example, the Smart City application, developed in Russia, allows blind and visually impaired people to successfully use public transport), smart bioprostheses (Russian companies InStep, Orthocosmos, manufacturers of prosthetic limbs with taking into account the specifics and health problems of the customer);
- occupational safety and health: monitoring the state of the production environment, eliminating work disruptions and emergency situations, as well as using artificial intelligence to work in an aggressive environment in which the use of human labor is significantly harmful to health. For example, at mining and processing plants in Russia, the Antison artificial intelligence system is used for drivers of dump trucks and special equipment to monitor driver fatigue, and Norilsk Nickel has implemented an artificial intelligence system that analyzes the availability of workwear, helmets, safety glasses and safety harnesses. The cameras automatically record violations, after which information is sent to managers and occupational safety specialists;
- humanization of labor: the use of industrial robots to perform routine operations, reduce physical exertion, physical severity of labor and the negative impact of industrial hazards (for example, the Aripix AI manipulator is used at the PIK-Industriya plant (production of ceramic tiles) and works in conjunction with a machine vision system: sorts tiles by color, checks whether there are scratches or defects on it; at the Tikhvin Carriage Building Plant, robots are used to perform welding, painting, and cleaning bodies before painting wagons);
- employment opportunities for the population in various regions of the country, remote from the place of residence of workers, as well as the use of such forms of employment as remote, virtual, allowing you to work remotely;
- opportunities for distance education, advanced training, and professional counseling. For example, Gazprom Socinvest, one of the most famous companies in Russia, offers staff development programs in a mixed format.: both face-to-face and remotely. The country's largest universities, St. Petersburg State University of Economics and the Russian Presidential Academy of Public Administration, also implement staff development programs in a mixed format;
- the use of Smart Home systems is a complex of home devices that are interconnected and perform actions at the command of a person or even without his participation, according to a schedule or a signal from a sensor, allowing for the functions of video surveillance, climate control, lighting, security, control of electricity consumption, etc.

The implementation of threats to information security consists in violating the confidentiality, integrity, and accessibility of information.

Information threats may be caused by:

- natural factors (natural disasters – fire, flood, hurricane, lightning and other causes);
- human factors . They are divided into:
 - threats that are accidental or unintentional. These are threats related to errors in the preparation, processing and transmission of information (scientific, technical, commercial, monetary and financial documentation); with an inappropriate "brain drain", knowledge, information (for example, in connection with population migration, travel to other countries, for family reunification, etc.);

- threats caused by deliberate, deliberate actions of people.
In table 2, we can see the main types of threats.

Table 2. Threats to the impact of information technology on the quality of life of the population.

Dangers	Impact on the quality of life of the population
Threats to the life and health of users, including children	Negative effects on a child's eyesight and posture due to prolonged viewing of content on a smartphone, tablet, laptop or PC, unwanted content (pornography, violent scenes, etc.), communication with strangers, unverified or malicious information on various topics, including medical ones, cyberbullying (deliberate systematic rude behavior on the part of one a person or group of people), fake news, involvement in illegal activities
Information threats (personal and commercial information)	Computer viruses and other malicious programs that can lead to the theft of personal data or the erasure of information on a computer, phishing (fraud of passwords, bank card information), extortion, the creation of fake accounts on social networks through which attackers gain access to personal information (for example, a person creates a profile under a false name, adds friends and in the process of communication, he tries to lure out the information he needs)
Financial threats (funds in banks, electronic wallets)	Loss of money through fraudulent websites and services of questionable origin. Fraudsters use links in emails, messages in social networks and chats, change website addresses to the most similar ones, and intercept data when connecting to online banking via unsecured Wi-Fi. (online casinos, sports betting, etc.).

Source: compiled by the authors

The use of information security tools in business sector organizations by country is shown in Table 3 and Figure 1.

Table 3. Use of information security tools in business sector organizations by country: 2022 (as a percentage of the total number of organizations).

№	Countries	Biometric user authentication tools	Encryption tools	Backing up data to media physically located outside the organization's premises
1	2	3	4	5
1	Finland	24	62	82
2	Germany	19	54	90
3	Netherlands	24	48	89
4	Denmark	17	51	91
5	Malta	16	49	82
6	Austria	12	45	87
7	Sweden	16	42	84
8	Norway	20	39	80
9	Czech Republic	18	32	81
10	Spain	17	32	79
11	Belgium	13	31	83
12	Luxembourg	12	37	77
13	Poland	11	46	68
14	Cyprus	10	39	74
15	Serbia	7	41	72
16	Portugal	12	33	74
17	Slovakia	12	34	72
18	Croatia	10	32	72

19	Turkey	12	47	55
20	Slovenia	12	32	69
21	Estonia	12	28	70
22	Italy	8	22	80
23	Ireland	9	33	65
24	Lithuania France	10	23	64
25	Hungary	8	32	57
26	Latvia	10	28	56
27	Bosnia and Herzegovina	6	35	47
28	Romania	13	27	47
29	Greece	6	26	52
30	Bulgaria	6	22	56
31	Russia	9	41	28
32	North Macedonia	5	26	47
33	Montenegro	4	21	47

Source: compiled by the authors based on [25].

The use of information security tools in business sector organizations in 33 countries shows that in 2022 in Russia, biometric means of user authentication accounted for only 6%, while Finland ranks 24% among the leading countries in Europe. Finland is also a leader in the use of encryption tools, the indicator is 62%, in Russia this indicator was 41%, that is, 1/3 less than the indicator of the leading country in Europe (Fig.1). In 2024, these indicators improved significantly due to the implementation of the national Digital Economy project and the Decree of Russian President Vladimir Putin "On the National Development Goals of the Russian Federation for the period up to 2030", which states: "...In order to achieve a breakthrough development of the Russian Federation, improve the standard of living of citizens, and create comfortable living conditions for them..." [10].

3. Results

The quality of life of the population is determined by the life expectancy of the population. Let's predict the life expectancy of the Russian population based on the level of use of artificial intelligence technologies. First, we will model the life expectancy of the Russian population from the level of use of artificial intelligence technologies in Table 4. A nonlinear paired regression has been calculated. Paired regression is an equation of the relationship between two variables y and x of the form $y = f(x)$, where y is the life expectancy of the Russian population (an effective feature); x is artificial intelligence technology (a feature factor).

Nonlinear model equation: $y(x) = a_0 + a_1x + a_2x^2 + \dots + a_nx^n + \varepsilon$;

The system of equations for determining the parameters of the polynomial has the following form:

$$\left\{ \begin{array}{l} a_0N + a_1 \sum_{i=1}^N x_i + a_2 \sum_{i=1}^N x_i^2 + a_3 \sum_{i=1}^N x_i^3 = \sum_{i=1}^N y_i \\ a_0N + a_1 \sum_{i=1}^N x_i^2 + a_2 \sum_{i=1}^N x_i^3 + a_3 \sum_{i=1}^N x_i^4 = \sum_{i=1}^N y_i x_i \\ a_0N + a_1 \sum_{i=1}^N x_i^3 + a_2 \sum_{i=1}^N x_i^4 + a_3 \sum_{i=1}^N x_i^5 = \sum_{i=1}^N y_i x_i^2 \\ a_0N + a_1 \sum_{i=1}^N x_i^4 + a_2 \sum_{i=1}^N x_i^5 + a_3 \sum_{i=1}^N x_i^6 = \sum_{i=1}^N y_i x_i^3 \end{array} \right. \quad (1)$$

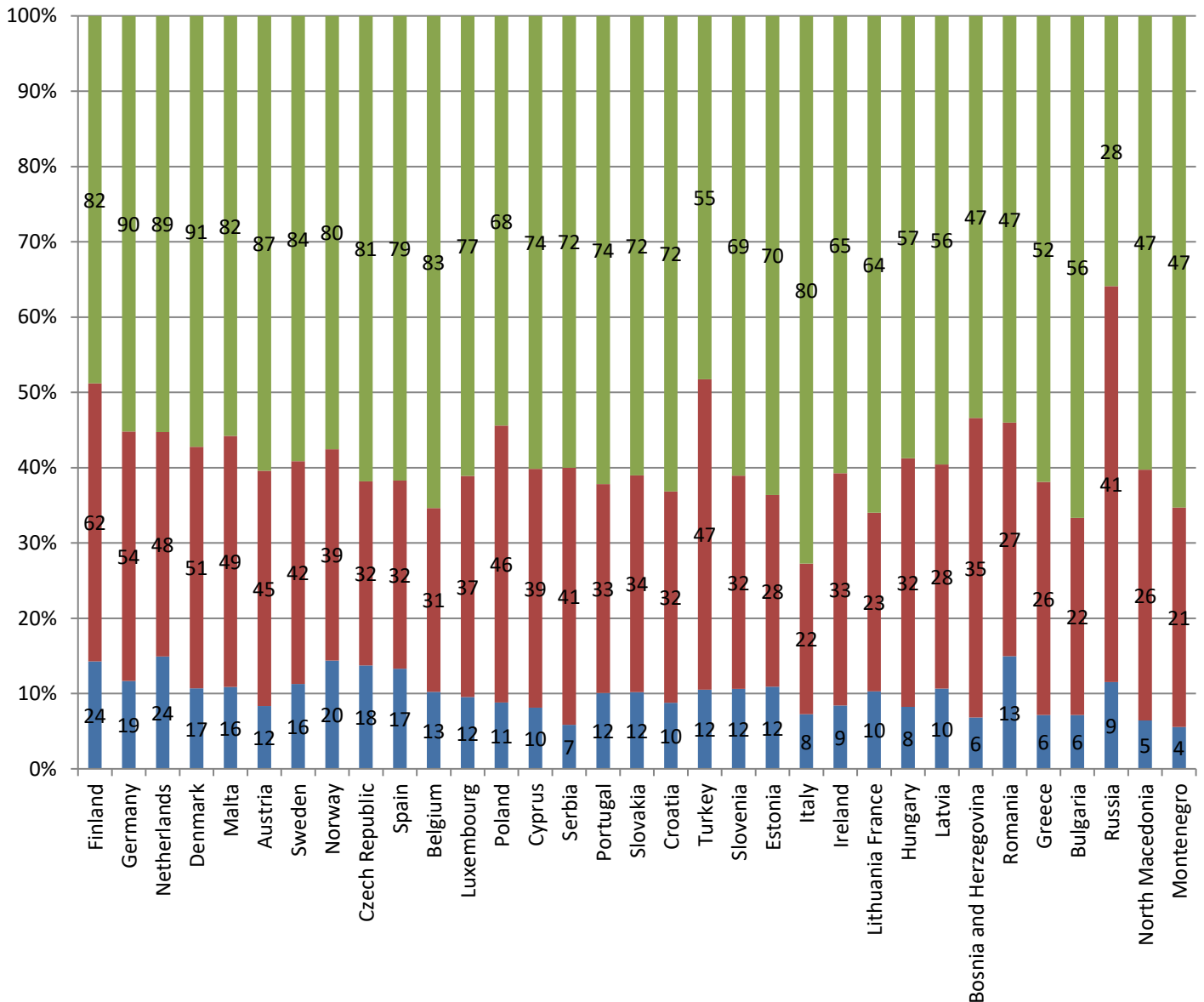


Fig. 1. Use of information security tools in business sector organizations by country: 2022*
(as a percentage of the total number of organizations)

Sources: Russia – calculations by the Institute for Statistical Studies and Economics of Knowledge, National Research University Higher School of Economics based on Rosstat data; foreign countries – Eurostat

The solution of this system of equations is carried out using Cramer's method, where: Δ is the determinant of the system of equations, Δa_0 , Δa_1 , Δa_2 , Δa_3 - are the partial determinants of the parameters.

$$a_0 = \frac{\Delta a_0}{\Delta}; a_1 = \frac{\Delta a_1}{\Delta}; a_2 = \frac{\Delta a_2}{\Delta}; a_3 = \frac{\Delta a_3}{\Delta}; \quad (2)$$

The obtained modeling results were calculated by substituting the actual values of the factors into the equation of the regression model according to formula 3; the values of the theoretical levels of life expectancy of the population were obtained over the years. We used nonlinear modeling of the dependence of life expectancy on the use of artificial intelligence technologies in Figure 2.

1 matrix	9	50,65	286,663	1631,976625
	50,65	286,663	1631,976625	9347,86
	286,6625	1631,976625	9347,86	53885,50
	1631,97663	9347,86	53885,50	312678,0449
2 matrix	649,95	50,65	286,663	1631,976625
	3657,3825	286,663	1631,976625	9347,86
	20698,4482	1631,976625	9347,86	53885,50
	117836,383	9347,86	53885,50	312678,0449
3 matrix	9	649,95	286,663	1631,976625
	50,65	3657,3825	1631,976625	9347,86
	286,6625	20698,44818	9347,86	53885,50
	1631,97663	117836,3826	53885,50	312678,0449
4 matrix	9	50,65	649,95	1631,976625
	50,65	286,663	3657,3825	9347,86
	286,6625	1631,976625	20698,44818	53885,50
	1631,97663	9347,86	117836,3826	312678,0449
5 matrix	9	50,65	286,663	649,95
	50,65	286,663	1631,976625	3657,3825
	286,6625	1631,976625	9347,86	20698,4482
	1631,97663	9347,86	53885,50	117836,383

Fig. 2. Matrix of life expectancy dependence on the use of artificial intelligence technologies
Source: Calculated by the authors based on data [26, 27].

Substituting the matrix values into the system of equations of the nonlinear model, we obtain the values of the determinants of the polynomial model. The output values of the determinants of the system of equations are in Table 4.

Table 4. Calculation of the determinants of the polynomial model of life expectancy from the use of artificial intelligence technologies.

Determinants of the polynomial model (polynomial of degree 3)	Values of the model parameters
a_0	149,3927141
a_1	-30,59731659
a_2	3,658339218
a_3	-0,118591778

Source: Calculated by the authors

The simulated value of the indicator of life expectancy from the level of influence of digital technologies is presented in Table 5.

Table 5. Simulated values of life expectancy in Russia from the use of artificial intelligence technologies for 2015-2023, years

Factors	Life expectancy in Russia (number of years)	Artificial intelligence technologies, %	Simulated value life expectancy at birth, (number of years)
Years	Y	X	Y'
2015	71,39	5,40	75,04
2016	71,87	5,45	75,41
2017	72,70	5,50	75,52
2018	72,91	5,60	75,38
2019	73,34	5,70	74,86
2020	71,54	5,80	73,81
2021	70,06	5,70	74,18
2022	72,73	6,60	74,10
2023	73,41	4,90	74,36
Total	649,95	50,65	672,65

Source: Calculated by the authors based on data [26, 27].

A graphical representation of the dependence of life expectancy of the Russian population on the use of artificial intelligence technologies is shown in Figure 3. With this coefficient of determination, it is possible to make a forecast of the life expectancy of the population at specific values of the factor - digital technology formula 3. The functional relationship between the level of life expectancy and the digital technology factor can be described by the equation (the type of alignment line is polynomial):

$$y = 0,012x^3 - 0,131x^2 + 0,315x + 71,94 \quad R^2 = 0,966 \quad (3)$$

At the same time, the accuracy of the approximation is $R^2 = 0.966$. This suggests that only 0.966 or 96.6% of the variation in life expectancy is due to the factors included in the model. Factors not included in the model affect only 3.4% of the resulting feature.

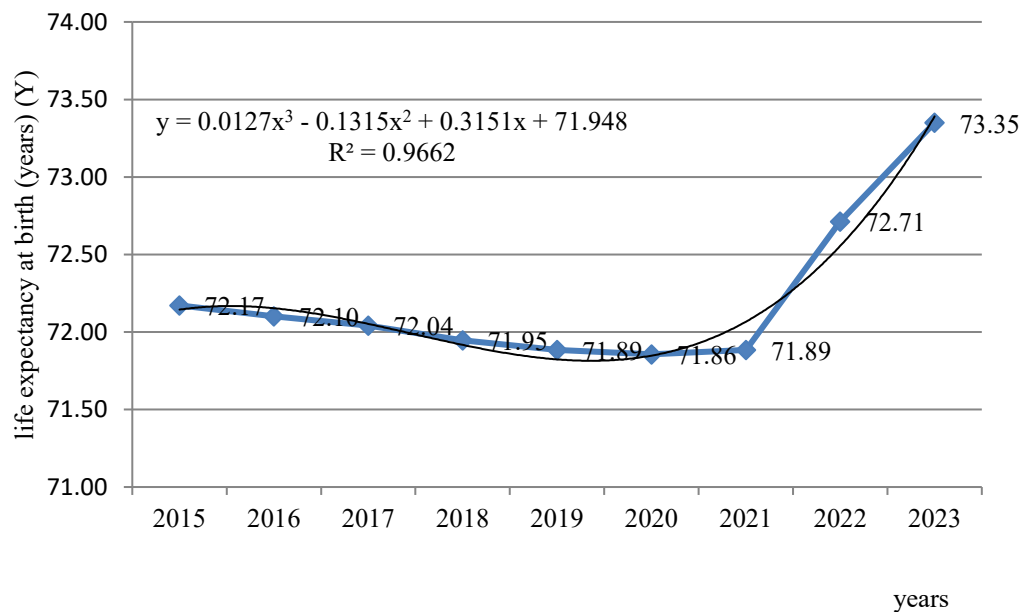


Fig. 3. Dependence of life expectancy of the Russian population on the use of artificial intelligence technologies, years.

The correlation coefficient equal to 0.966 shows a high closeness of the connection between the selected features equal to 96.6%. Let's calculate the point forecast taking into account the "Predict" function of MS Excel, selecting the arguments of the function in Table 6 and in Figure 4.

Table 6. Forecasting the life expectancy of Russia from the use of artificial intelligence technologies until 2026

Years	Modeled value of life expectancy forecast, years
2015	71,39
2016	71,87
2017	72,70
2018	72,91
2019	73,34
2020	71,54
2021	70,06
2022	72,73
2023	73,41
2024	72,55
2025	72,62
2026	72,68

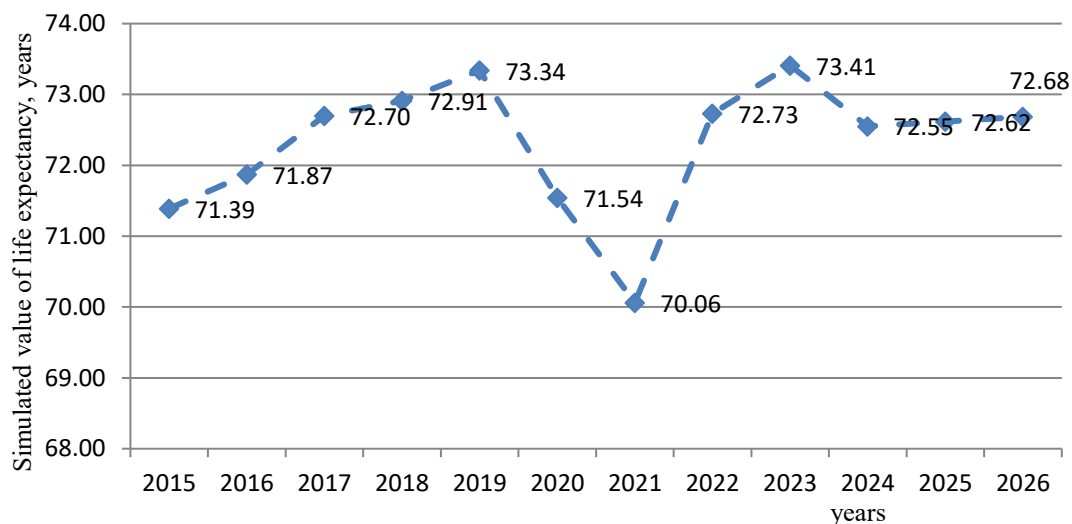


Fig. 4. Forecast of life expectancy of the Russian population from the use of artificial intelligence technologies, years.

The graphical result of forecasting for 2024-2026 shows an increase in the life expectancy of the population due to the use of artificial intelligence technologies, and for 2026 its value will be 72.68 years.

4. Discussion

Our results do not contradict the data obtained by other researchers. The opinion of the majority of scientists is confirmed [9, 21, 28, 5, 29] that digital technologies and artificial intelligence technologies significantly change certain aspects of our lives, and Russia is one of the countries where artificial intelligence technologies are manifested everywhere and very successfully [11]. However, there are not only advantages, but also risks [23, 24]. But the study proved that the positive impact of digital technologies and artificial intelligence is more significant, it will affect both the quality of people's lives in the coming years and its duration. The article identifies and formulates the main directions of the positive impact of digital transformation on the quality of life of the population, as well as describes the risks of using digital technologies and artificial intelligence. It has been shown that life expectancy is expected to increase.

5. Conclusion

Thus, it can be stated that despite the existing disadvantages and threats of the use of digital technologies and artificial intelligence technologies, their positive impact on the quality of life is incomparably higher. This is reflected in the reduction of time spent on performing various payment transactions, various routine labor operations in private life (in everyday life), in expanding professional training and employment opportunities, health and working capacity through the transfer of difficult and dangerous labor processes to robots and artificial intelligence, monitoring the state of the industrial and household environment using digital technologies, in reducing the risk of loss or distortion of information during data transmission and communication, in supporting people with disabilities. In order to reduce the negative impact of digital transformation on the quality of life of the population, joint efforts of the state, organizations and enterprises involved in digital transformation, and citizens themselves are necessary. To combat disinformation and cybersecurity threats on the Internet, the government can take the following steps:

- to introduce mandatory authorization with the indication of personal data of citizens when creating accounts and posting information;
- Develop a fact-checking infrastructure by investing in tools and mechanisms that support independent fact-checking with the participation of journalists and civil society;
- Increase society's resilience to false information and misinformation by implementing digital and media literacy programs that develop critical thinking skills;
- encourage cooperation between government agencies and private companies by creating platforms for sharing information about cyber threats and joint efforts to prevent them;
- allocate additional funds for the training of cybersecurity specialists and the development of technologies for the investigation of cybercrimes;
- adapt legislation to respond more effectively to existing and new cyber threats;
- create a separate law enforcement unit to form a unified database, record and analyze cybercrimes, as well as train specialists in the investigation and prevention of cybercrimes.

These measures will contribute to improving the quality of life of citizens in the context of digital transformation.

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