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**THE IMPACT OF THE CRISIS ON THE SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT OF THE TERRITORY. THE POST-PANDEMIC TRENDS**

***Abstract.*** *The article analyzes the current post-pandemic trends. The existing technological trends and their influence on society are analyzed. In conclusion, conclusions are drawn with an emphasis on the governmental role in the process of adaptation of the new technologies.*

***Key words:*** *post-pandemic trends, crisis, challenges, artificial intelligence, security, online learning, eco trends, telemedicine.*

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The modern crisis caused by the global COVID-19 pandemic has led to a severe global recession with differential impacts within and across countries [1]. However, new challenges cause new solutions. As Peter Tilth, a co-founder of PayPal, has mentioned in his book «Zero to One»: «New technology has never been an automatic feature of history» [2]. The changes have to be boosted by the expectations society has or difficulties that appeared. The crisis has a dual role, the breakdown of familiar patterns and the loss of connections stimulate the creation of something new – creation through destruction.

The impact of the current crisis is enormous, the world experiences a high level of uncertainty. While some spheres remain untouched, others have great room for development. There are certain signals of changes to be analyzed and taken into consideration. The scenario-based approach gives an opportunity to manage uncertainty and minimize its risks. The signals represent new inventions, ideas, behavior patterns, or the destruction of existing mechanisms. The development of the following trends in Russia can be underlined: security, online learning, telemedicine, artificial intelligence, eco trends.

Security. The pandemic has dramatically increased the level of anxiety in society as the basic sense of security has been lost. The emergence of low-touch economy is a response to the actively growing request of maintaining social distance and minimizing touch to external objects. That leads to the creation and implementation of digital services, such as digital kiosks (without cash registers) and with automatic delivery of orders, glance payment development, and biometric data promotion, further spread of QR codes. Sberbank and Visa launched glance payments with the biometric data in the Prime café network in Moscow [3]. The solution has been developed using the technology of one of the Skolkovo residents – VisionLabs.

While avoiding contacts and operating mostly remotely, the level of cyber attacks has increased. The term «network hygiene» has appeared together with strengthening the protection of customer personal data. Currently Russia is striving to become a leader in the implementation of digital services. Digital security will be included in the concept of public security of the Russian Federation. As Dmitry Medevdev, Deputy Chairman of the Security Council of Russia, claims: «Everyone went online, and this creates a favorable environment for cyber fraudsters, for the growth of crime in the virtual sphere» [4]. In order to prevent the consequences that can be potentially caused by cyber attacks further protection measures should be developed. The Digital Risk Summit has been held in Amsterdam in June 2021, numerous researches showed that the level of scaming has increased dramatically. In 2020, the increase in the number of violations in Russia related to scam and fishing recorded by Group-IB amounted to 35% compared to the year before [5]. Both digital and physical security requires governmental intervention.

Online learning – the booming trend of the current year. The transition to online learning has become a challenge, however, new reality requires changes in the educational process. The best online resources in Edtech like Yaklass, Uchi.ru, Dnevnik.ru are compelling, and their solutions are actively used in regions. Companies are now refining their products so that they can be integrated in compulsory education systems, and some have already entered export markets [6]. The quality of online education will continue to grow. Basic school education will be accompanied by less stress for students and provide new opportunities for self-development in the direction of interest. The government plays the key role in these changes – adapting the educational process to the specific needs and providing the necessary equipment and Internet access to each family.

Telemedicine. Telemedicine is the most modern form of provision of medical services and is used in situations where the physician and patient are not in the same place [7]. The pandemic has accelerated the growth of telecare technologies. Kaluga Region became the first in Russia where telemedicine was included in the compulsory medical insurance system [8]. Online healthcare platforms are free of charge and give an opportunity to consult a doctor remotely. If the online platforms have been integrated into society successfully, the use of telemedicine still causes doubts and concerns. However, the lockdown started to change the perception and has already proven the first positive outcomes. Using the new medical opportunities can be especially relevant for  the elderly and people with chronic diseases. Telecare solutions provide new options for treatment, reduce socioeconomic disparity with regard to access to care, and give equal opportunities to patients from urban and rural areas. Although telecare has significant advantages, it also has some drawbacks. The government has to implement special programs to support older people to acquire the knowledge and skills necessary for use of electronic devices and computer systems. Other important elements are privacy and security when building confidence in telemedicine systems. With the right approach and step-by-step plan of implementation, telecare can become an integral part of the lives of the elderly in the near future.

Artificial Intelligence. Russia’s leaders have been paying close attention to artificial intelligence technologies for many years now. In October 2019 the country adopted a long-discussed National Strategy for the Development of Artificial Intelligence Through 2030 [9]. The pandemic has boosted the process. The main areas of research are face recognition, emotion recognition, implementation of virtual assistants and chatbots. Virtual assistants are becoming more and more like people – they talk and learn to recognize emotions. A lot of companies try to ensure that their chatbot not only has information about everything but is perceived by the consumer as a full-fledged interlocutor [10]. In April 2020, the Russian Ministry of Health launched a virtual assistant –the Zojikbot, that answers general questions about coronavirus [11]. The use of bots from government services makes them the reality for citizens, accelerating the mass adoption of technology for customers and creating a request for similar solutions from the side of commercial organizations.

Another example is face recognition technologies. The Korean company Cubox together with the Russian Lanit are going to launch a joint production of biometric identification systems in the Kaluga region [12]. It is planned that the new equipment will appear at the Kaluga International Airport and at the facilities of the «Smart city» in Obninsk.

Eco trends. While the pandemic has caused serious economic problems, the environment has lost its significance. During the time of self-isolation, the volume of garbage increased due to the boom in delivery. The growth in the volume of packaging and the widespread mandatory use of disposable antiviral protection has given rise to a new round of garbage challenge. In the short term, with the removal of pandemic restrictions, the trend to reduce the use of single-use packaging, as well as the trend towards conscious waste disposal, will come back. For example, the delivery service Yandex.Lavka switches to more durable bags made from polyethylene [13]. A multinational clothing retail company H&M gives extra points for not using paper bags.

Other trends are getting more and more popular with further development of technologies. The role of the government is to make the adoption process softer for the citizens and create the legal framework for successful implementation. Violation of the current order of things stimulates the search mechanisms and leads to the rebalancing of interrelated things.

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