



A biweekly newsletter on AI and autonomy developments in Russia

CNA Russia Studies Program

HIGHLIGHTS OF ISSUE 45

- The Ministry of Digital Development and the Ministry of Economic Development announced that they will be updating plans to introduce AI into the economy by October 2022. The update will include the creation of different federal bodies to introduce AI into key industries and prioritize domestic AI solutions for the replacement of foreign products.
- On July 31, 2022, President Putin unveiled a new national maritime doctrine that calls for the formation, development, and implementation of priority technologies to support the development of new weapons systems and special equipment, such as marine robotic complexes, including AI-enabled robotic systems, along with maritime UAVs.
- Industrial production is about to begin for AI-enabled network equipment using domestic software in line with import-substitution requirements.
- According to a TASS article, physicists from Russia's National University of Science and Technology have developed a library of algorithms that will enable the rapid development of quantum applications.
- On August 2, 2022, US OFAC included several high-tech organizations on its sanctions lists, including the Skolkovo Foundation, which supports technology entrepreneurship; the Skolkovo Technopark, which hosts startups; and Skoltech, which develops innovative technologies. This can seriously complicate the development of telecom equipment on an open interface, as well as for 6G communications.

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GOVERNANCE AND LEGISLATION

UPDATED PLANS ON NEW AI-IMPLEMENTED SOLUTIONS

The Ministry of Digital Development and the Ministry of Economic Development recently announced that they will be updating the plans to introduce AI into the economy by October 2022. This update will include the creation of different federal bodies to help introduce AI into key industries and prioritize domestic AI solutions for the replacement of foreign products, a broader goal of the Ministry of Economic Development.

On July 28, 2022, the Minister of Economic Development Maxim Reshetnikov and the Minister of Digital Development Maksut Shadayev reportedly held a meeting with Russian entrepreneurs, business representatives, and government leaders on AI innovation and development. Speakers highlighted progress thus far, including the introduction of a code of ethics in the field of artificial intelligence that has been signed by many organizations in regions throughout Russia. (See issue 41 of AI in Russia, for more detail on the code of ethics in the field of artificial intelligence.) Also of mention were the grants, acceleration programs, and tax incentives introduced by the government thus far, and their ability to foster the development of projects and ideas that implement AI solutions. In fact, by the end of 2021, more than 300 AI development companies have received state support. Official reporting is cheerful in suggesting that educational, private, and public desire for AI research and implementation has rapidly expanded.

Sources: "The Ministry of Digital Development and the Ministry of Economic Development are updating the plan for the introduction of AI in the economy by October" [Минэкономразвития и Минцифры планируют к октябрю 2022 г. актуализировать план действий по каждой из ключевых отраслей экономики в части внедрения в них искусственного интеллекта], Tass.ru, July 28, 2022, <https://tass.ru/ekonomika/15336299?>; "The Ministry of Economic Development and the Ministry of Digital Development will work out a plan for the introduction of artificial intelligence in key sectors of the economy" [Минцифры и Минэкономразвития актуализируют к октябрю план внедрения ИИ в отрасли экономики], Cnews.ru, July 28, 2022, https://www.cnews.ru/news/line/2022-07-28_minekonomrazvitiya_i_mintsifry.

NEW BILL TO FACILITATE GREATER PRIVATE-PUBLIC PARTNERSHIP ON IT AND AI DEVELOPMENT SUBMITTED TO STATE DUMA

Deputies from United Russia and United Russia senators submitted a bill to the Russian State Duma (the lower house of the Russian parliament) that proposes amendments to public-private partnership agreements and agreements for IT facilities at the municipal level to remove existing barriers and expand AI information technology development potential. TASS reporting quoted some of the bill supporters touting its potential to "contribute to the development of the IT industry, increase the attractiveness of concluding concession agreements, agreements on public-private and municipal-private partnerships in the IT sector, and...attract investment." If the bill becomes law, it will allow for the possibility of using existing

results of intellectual activity in the development of new IT projects, whereas currently existing IT activity can only be used on its existing project.

Source: "United Russia members submit to the Duma a bill on the development of artificial intelligence through PPP" [Единороссы вносят в Думу законопроект о развитии искусственного интеллекта с помощью ГЧП], Tass.ru, Aug. 3, 2022, <https://tass.ru/ekonomika/15381451?>.

MILITARY AND SECURITY

NEW RUSSIAN MARITIME DOCTRINE EMPHASIZES NEW TECHNOLOGY DEVELOPMENT AND ACQUISITION

On July 31, 2022, Russian President Vladimir Putin unveiled a new national maritime doctrine. The doctrine emphasizes Russia's place as a major naval power and features many provisions that aim to support and underscore that status. The document designates the United States and NATO to be Russia's competitors across the maritime domain. The doctrine calls for the formation, development, and implementation of priority technologies to support the development of new weapons systems and special equipment, such as marine robotic complexes, including AI-enabled robotic systems, along with maritime UAVs. Other priorities listed include the development of autonomous stations for transmitting/communicating information via satellite and via hydroacoustic networks, and the development of a unified secure information and telecommunications systems for Russia's maritime vessels.

Prior to the war in Ukraine, the Russian Navy and its defense enterprises were running at least 17 different unmanned underwater and surface vehicle projects aimed at maritime exploration and ISR at different depths, some with military applications. These projects may now receive increased focus as the Russian government and the MOD aim to produce technology that enables the country to better position itself in the maritime environment. It is not clear how some of these projects will fare given the ongoing sanctions against Russia, and the ongoing restructuring of the domestic defense-industrial enterprises away from dependence on imported technology.

Sources: Russian Federation Maritime Doctrine, <http://publication.pravo.gov.ru/Document/View/0001202207310001>; "New maritime doctrine and what it says about digitization and informatization" [Новая морская доктрина РФ – что сказано о цифровизации и информатизации], D-Russia.ru, Aug. 1, 2022, <https://d-russia.ru/novaja-morskaja-doktrina-rf-cto-skazano-o-cifrovizacii-i-informatizacii.html>; "The Naval Doctrine of the Russian Federation was approved" [Утверждена Морская доктрина Российской Федерации], Kremlin.ru, July 31, 2022, <http://kremlin.ru/acts/news/69084>.

MANUFACTURING QUALITY OF RUSSIAN ROCKET ENGINES TO BE CONTROLLED BY ARTIFICIAL INTELLIGENCE

The Federal State Unitary Enterprise NII Avtomatiki and Motiv Enterprise demonstrated new technology based on digital design, machine vision, and augmented reality at a rocket

engine assembly plant. Using cameras, the specialized software will record and evaluate the engine designer at work, while controlling the technical process and its different stages. According to the developers, this technology aims to reduce the human factor when performing manual operations, which should have a positive net impact on manufacturing quality.

According to the article, the system aims to solve certain production problems associated with the difficulty of simultaneous use of paper or electronic technical documentation and ongoing manual operation, and the lack of constant objective control of all stages of manual operations. Earlier, we wrote about Russia's use of AI technologies in military industrial processes and enterprises, a trend that is growing across the country's defense industries.

Sources: "Manufacturing quality of Russian rocket engines to be controlled by artificial intelligence" [Качество сборки российских ракетных двигателей будет контролировать искусственный интеллект], [ixbt.com](https://www.ixbt.com/news/2022/07/27/kachestvo-sborki-rossijskih-raketnyh-dvigatlej-budet-kontrolirovat-iskusstvennyj-intellekt.html), July 27, 2022, <https://www.ixbt.com/news/2022/07/27/kachestvo-sborki-rossijskih-raketnyh-dvigatlej-budet-kontrolirovat-iskusstvennyj-intellekt.html>.

RUSSIAN MILITARY CONTINUES USING UAVS IN RECONNAISSANCE STRIKE AND FIRE CONTOURS

In issues 33 and 43, we described how the Russian military uses reconnaissance-fire/reconnaissance-strike contours (complexes). These tactics refer to different operational levels of sensor-to-shooter networks that attempt to enable strikes using information in real time. Russian media regularly publish accounts of these tactics against Ukrainian defenders.

In July 2022, *Krasnaya Zvezda (Red Star)*, one of the official MOD publications, described several accounts of UAV use with artillery and long-range strike systems. In one, 2S-19 "Msta-S" self-propelled howitzer crews were striking Ukrainian defenses, suppressing command posts, and destroying weapons and military equipment with the help of UAV target designation. The publication claimed that mere minutes pass between the target detection by a drone and the subsequent strike. Another *Red Star* account discussed a Uragan multiple launch rocket system (MLRS) destroying Ukrainian armored vehicles, motorized infantry, and tank units, with target detection and fire correction carried out by unmanned aerial vehicles. In a similar description, Grad MLRS systems were firing on Ukrainian positions practically nonstop with the help of UAVs, whose targeting data was transmitted to the field headquarters and rocket-artillery battery commanders.

This tactic is used by both Russian and Ukrainian forces, highlighting the importance of UAV operators in the ongoing war. Such widespread UAV use for ISR and target designation is prompting both militaries to search out and target each side's drone operators. In early August, Russia's TASS daily online publication noted that Russian military killed 37 Ukrainian operators in the span of two days. Ukraine is also targeting Russian operators in return, leading to the need to train more skilled individuals for combat (see story on the Dronnitsa event in this issue).

Sources: Aleksandr Pinchuk, "Self-propelled howitzers strike without fail" [Самоходные гаубицы бьют без промаха], *Krasnaia zvezda*, No. 77, July 18, 2022, <https://dlib.eastview.com/browse/doc/78826190>; Vladimir Linyov, "Uragans are destroying Ukrainian positions" [«Ураганы» сносят позиции всу], *Krasnaia zvezda*, No. 76, July 15, 2022, <https://dlib.eastview.com/browse/doc/78737752>; Aleksandr Pinchuk, "Grad delivers massive strike" [Град поражает площадями], *Krasnaia zvezda*, No. 74, July 11, 2022, <https://dlib.eastview.com/browse/doc/78663452>; "Rosgvardiya liquidated 13 Ukrainian drone operators in the Luhansk People's Republic" [Росгвардия ликвидировала в ЛНР 13 украинских операторов БПЛА], Tass.ru, Aug. 2, 2022, <https://tass.ru/armiya-i-opk/15367903>; "Rosgvardiya destroyed additional 24 Ukrainian drone operators in the Luhansk People's Republic" [Росгвардия уничтожила в ЛНР еще 24 украинских оператора БПЛА], Aug. 4, 2022, <https://tass.ru/armiya-i-opk/15396847>.

ALMAZ-ANTEY DEVELOPS LIGHT DRONE FOR UKRAINE WAR

The Ukraine war has demonstrated the utility of light, tactical drones and quadcopters for intelligence, surveillance, and reconnaissance. Both Russian and Ukrainian forces are using large numbers of commercial DJI quadcopter and multicopter drones for such missions, prompting the Russian military to speed up the development of military-grade light quadcopters.

In early August, the Almaz-Antey defense enterprise announced that it is completing the development of a multifunctional light drone with a range of up to 5 km that can reach speeds of up to 120 km/h. The company noted that the drone can be used without communicating with its operator via preloaded flight routes. In line with the current emphasis on sanction-proofing domestic military production, Almaz-Antey notes that this drone consists of 90% Russian components, without describing what the remaining 10% of the components. According to the company, the new drone has high strength and low weight due to the use of carbon fiber and filled polymers, as well as the extensive use of additive technologies in the production of its components.

Source: "'Almaz-Antey' has created a UAV with increased maneuverability and high strength" [Концерн ВКО "Алмаз-Антей" создал БПЛА с повышенной маневренностью и высокой прочностью], Tass.ru, Aug. 3, 2022, <https://tass.ru/armiya-i-opk/15382531>.

MARKETS AND PRIVATE SECTOR

YANDEX BRINGS AI TO BEAR IN NEW CORPORATE DEVELOPMENTS

Yandex is pursuing a variety of new uses for AI-based technology developments. On the hardware side, the company is introducing new warehouse robots designed to simplify and speed up particularly monotonous tasks at the warehouses for Yandex.Lavka and Yandex.Market. The robots are still in prototype, but are now operational. One of the robots will take inventory of goods stored in the Yandex.Market logistics complex. The other will move goods in the Yandex.stores dark store [a retail outlet used exclusively for online shopping], as well as arrange

them on shelves and bring them to order-pickers. According to reports, Yandex is preparing to automate more of its warehouse operations through robots in the next several years.

On the digital side, Yandex is introducing a new AI element to Yandex.Music called "Neuromusic." Neuromusic is a feature that creates "an endless melody that is generated by algorithms in real time." The algorithm has three modes: "calmness," "inspiration," and "energy." The feature has no words or pauses that would distract the listener, and is designed for when users wish to focus "on creativity, study, work, exercising, reading, or any other activity that requires high concentration." The algorithm was built using a neural network that analyzed a library of tens of thousands of musical compositions from a variety of genres, including rock, hip-hop, pop, electronica, and "ambient" musical styles.

Sources: "Neuromusic appeared in Yandex Music" [В «Яндекс музыке» появилась «Нейромузыка»], CNews, Aug. 2, 2022, https://www.cnews.ru/news/line/2022-08-02_v_yandeks_muzyke_poyavilas; "Yandex released industrial robots" [«Яндекс» выпустил промышленных роботов], CNews, Aug. 1, 2022, https://www.cnews.ru/news/top/2022-08-01_yandeks_sozdal_promyshlennyh.

VK TESTS NEW CLOUD COMPUTING FRAMEWORK

A new cloud computing ML platform is being developed by VK, the Russian internet services and social media company. The new platform, "VK Cloud Solutions," is designed to "combine convenient tools for experimenting with data and working with machine learning models: from setting up the digital environment to implementing solutions into services and business processes," according to the company. Dmitry Lazarenko, the product director at VK, stated that "when developing the product, we relied on the use of open source components in its architecture in order to flexibly develop the functionality of the platform and avoid dependence on the technologies of a particular vendor." This also eases the product into import-substitution requirements that would otherwise limit the usage of foreign software. The platform will also be available to companies that prefer to work with data on their own or rented servers. The service can be deployed in a private cloud, thanks to the platform technology stack built on free software.

Source: "VK has created a cloud platform for developing ML solutions" [VK создала облачную платформу для разработки ML-решений], CNews, Aug. 2, 2022, https://www.cnews.ru/news/line/2022-08-02_vk_sozdala_oblchnuyu_platformu.

UNIFIED NATIONAL STANDARD TEST FOR AI-BASED MEDICINE UNDER DEVELOPMENT

A single unified standard test ("GOST," or "interstate standard") is being developed for artificial intelligence in the medical field. The test is being activated first in Moscow. It was announced as approved by the deputy mayor of Moscow, Anastasia Rakova, and will be implemented starting on September 1. The new document regulates the requirements for clinical trials of neural networks. According to the developed GOST system, specialists will receive an accurate assessment of whether the product meets the declared characteristics of accuracy and efficiency, and whether it carries risks to the patient's health.

A report in *Izvestiya* notes why this new GOST standard will be impactful for Russian medicine: “[For example], on April 18, the press service of Sechenov University announced that the scientists of the scientific institution are working on a digital algorithm for diagnosing nodular formations in the lungs based on computed tomography (CT) data. It is noted that the algorithm will help eliminate the human factor in the analysis of data, as well as determine lung cancer in the early stages. At the moment, the success of scientists lies in the ability of artificial intelligence to recognize areas suspicious of lung cancer on CT scans and additionally highlight them.” The new GOST system will enable more systematic tracking and approval of these sort of developments.

Source: “Russia is working on a national standard for testing AI” [В РФ разработали ГОСТ по тестированию искусственного интеллекта], *Izvestiya*, Aug. 2, 2022, <https://iz.ru/1373558/2022-08-02/v-rf-razrabotali-gost-po-testirovaniuu-iskusstvennogo-intellekta>.

AI ON OIL AND GAS

Russian scientists have developed and patented a machine learning system that allows choosing the optimal parameters for each well where oil is produced by hydraulic fracturing. This will significantly increase the profitability of fracking oil production, according to a recent announcement by Skoltech. The technology facilitates the extraction of oil from complex rock formations by injecting a mixture of water, chemical additives, and solid granules into them, which are introduced into the well at high pressure. This leads to the appearance of many new fractures in the rocks and an increase in the size of existing passages, which increases the rate of extraction of hydrocarbons from the field. They quote a Skoltech researcher, Viktor Duplyakov, explaining the benefits of AI in this field: “Instead of trying to maximize total production at any cost, artificial intelligence can be tasked with balancing oil recovery and environmentally significant metrics, such as the amount of fresh water and chemicals used, diesel fuel used to power pumps, and greenhouse gases emitted into the atmosphere.”

Skoltech specialists and colleagues from Gazpromneft NTC have developed several approaches based on machine learning systems that allow the user to quickly calculate how efficiently oil is extracted from a well at a certain pressure, composition of the injected mixture, and other fracking parameters. Similarly, scientists have created algorithms to solve the inverse problem—to select the optimal parameters of hydraulic fracturing to ensure a certain level of hydrocarbon production. In the future, this will not only increase the profitability of oil production but also make it more environmentally friendly. The new announcement is just the beginning, according to Skoltech, which noted, “We have trained artificial intelligence to predict well performance based on a unique field database that we have collected and carefully verified. It contains 92 characteristics of the well, the surrounding rock and hydraulic fracturing for 6,000 wells from 23 fields.”

Source: “A neural network that increases the profitability of oil production was developed in Russia” [Повышающую рентабельность добычи нефти нейросеть разработали в России], TASS, July 27, 2022, <https://nauka.tass.ru/nauka/15324863>.

NEW AI COOPERATION AGREEMENTS

The following bullets include descriptions of new AI cooperation agreements by private companies:

- Treolan, a subsidiary of the “Lanit” group, signed a cooperation agreement with Argo Technology East. The company has patented the Argo Data Storage System software (“SHD Argo”) based on its own operating system. SHD Argo is used for long-term storage of large amounts of data (Big Data) and archives, building digital video systems, creating analytics clusters and data backup, and deploying NAS network file storages. It is used in order to replace the Amazon S3 cloud solution with a local one that has a compatible interface, and to build a VDI infrastructure, etc. The software provides unsurpassed scalability, reliability of storage and processing of data, and a high degree of data protection. Argo is included in the unified register of Russian computer programs and databases.
- The Sitronics Group has signed an agreement with Electronic Moscow JSC to provide solutions for analyzing ultra-high-resolution satellite images and automatically detecting changes in the urban environment. The work will be carried out in the interests of the Department of Information Technologies of the City of Moscow and the State Inspectorate for Control over the Use of Real Estate. Under the contract, Sitronics Group will present a minimum of three solutions. The system will have to analyze satellite images and determine the appearance and disappearance of capital construction objects, temporary buildings, and construction sites, as well as changes in the boundaries of land plots and spatial changes in buildings.

Sources: “Treolan starts supplying Argo Technology East products” [Treolan начинает поставки продукции компании «Арго технолоджи ист»], CNews, July 29, 2022, https://www.cnews.ru/news/line/2022-07-29_treolan_nachinaet_postavki_produktsii; “Sitronics Group will select a solution for the analysis of the urban environment in Moscow” [Sitronics Group подберет решение для анализа городской среды в Москве], TASS, July 28, 2022, <https://tass.ru/ekonomika/15334785>.

UNMANNED VERSION OF AN-2 AIRCRAFT ANNOUNCED

The An-2 aircraft built by Navigator and known as the “kukuruznik,” or “corn,” is planned to be made unmanned; the process has already begun and should take two years. This is particularly important, given that the aircraft is very low-tech in its current makeup, and does not even have an automatic control system. The goal of the upgrade is to provide a very cheap airframe for automated unmanned flight.

According to Dmitry Malov, the director of the Moscow branch of Navigator, “The An-2, although not a new aircraft, is very popular and competitive. The Czech Cessna is the main competitor, it occupies a decent part of the world market. There is only one difference: the presence of an ACS system—an automatic control system. They have it, we don't, in all other respects, the An-2 wins.” He also noted that the upgrades are important, but doable: “To create an unmanned version of

the An-2 aircraft, the Navigator company developed a VPNP unit (computer of flight and navigation parameters). A small product the size of an average book carries the necessary set of sensors (air signal system, inertial and satellite receiver), as well as a modern calculator.”

Source: “‘Kukuruznik’ An-2 can be made unmanned” [“Кукурузник” Ан-2 могут сделать беспилотным], RIA Novosti, July 27, 2022, <https://ria.ru/20220727/an-2-1805219206.html>.

RUSSIA POST INTRODUCES AUTOMATED TEXT ANALYSIS SYSTEM FOR ITS BANKING ARM

Post Bank has launched an automated text analysis system (FIS ACAT) based on the no-code platform FIS Platform. It is designed to automate the work of security specialists with incoming law enforcement requests. FIS ACAT allows the user to reduce manual labor by 30%, reduce the time for obtaining information from related departments by 25%, and increase control of access to information by 47%.

Implementation of the system took about three months. According to Olga Stepanova, the credit director of Post Bank, the project is a logical continuation of many years of successful cooperation between the bank and FIS. “Introduced in 2018, the FIS Antifraud anti-fraud system allowed the bank to recognize fraudulent schemes 2 times faster. Post Bank is focused on the development of innovative technologies and compliance with the latest digitalization standards, so we continued to automate a set of business processes to identify risk events.”

ACAT system users can contribute to the investigation of internal and external threats. The system performs intellectual analysis of unstructured texts (mail, e-mail, arbitration documents, etc.) to compile a profile of objects (individuals and legal entities) and document the risk events that have occurred for each of them. Thanks to the introduction of the system, the bank plans to improve the speed of processing and preparing information on incoming requests from law enforcement agencies, improve the unified information environment, and improve the overall data management methodology.

Source: “Post Bank has implemented an automated text analysis system FIS” [«Почта банк» внедрил автоматизированную систему анализа текста FIS], CNews, July 28, 2022, https://www.cnews.ru/news/line/2022-07-28_pochta_bank_vnedril_avtomatizirovannuyu.

TSIFRA CEO DEPARTS FOR NEW PROJECT

Igor Bogachev, known for his senior positions in the Russian office of SAP and the Skolkovo IT cluster, is leaving the post of CEO of Tsifra. According to statements by Bogachev, he has decided to move on to head the strategy of an thus far unannounced new company—a “market leader,” which in the near future will change the way of life in several key sectors of the Russian economy. Bogachev has held his post since the founding of Tsifra. The company was created in June 2017 as a wholly owned subsidiary of the Renova group, led by Viktor Vekselberg.

In an interview with Bogachev, he leaves Tsifra for another IT project. “I have matured the strategy of a new company, a market leader, which will soon change the way of life in several key sectors

of the economy, just as Tsifra has already de facto changed the management of industrial production. In the near future, investors will agree on disclosure of information and I will talk in detail about a new market player.”

Tsifra has grown significantly since its founding five years ago: several hundred industrial enterprises in mechanical engineering, mining and metallurgical fields, and oil and gas industries have become customers of the company. More than 20 enterprises are connected to the Digital Internet of Things platform; a joint venture with Gazprom Neft was created on its basis. In 2020, the company announced a strategic partnership with MTS to cooperate in the development of pLTE networks in the mining industry, as well as to develop proprietary MTS products based on the Zyfra IIoT Platform.

Source: “The ex-head of SAP CIS and Skolkovo IT cluster left the CEO of Tsifra to create a ‘new market leader’” [Экс-глава SAP СНГ и ИТ-кластера «Сколково» ушел из гендиректоров «Цифры», чтобы создать «нового лидера рынка»], CNews, https://www.cnews.ru/news/top/2022-07-28_eks-glava_sap_sng_i_it-klastera.

FACIAL AUTHENTICATION SYSTEM UNDER DEVELOPMENT FOR RUSSIAN NUCLEAR POWER PLANT SITES

The state operator of Russian nuclear power plants, which is part of Rosatom, is creating a facial authentication system for employees “without processing biometric information.”

When designing it, the state corporation focused on technical solutions that, from a legal point of view, would allow it not to process and store personal data, and therefore not fall under the regulatory norms of 152-FZ, which is a major legal obstacle to facial recognition at certain state institutions.

It will be an access control system based on video analysis and artificial intelligence technologies. The project is aimed at improving the safety of nuclear power plants, compliance with the rules of labor protection, industrial safety and optimization of processes for the admission of personnel to rooms with electrical equipment. The algorithm of the system, based on Russian software, will have to ensure recognition of a person by cameras when wearing personal protective equipment (mask and helmet), provided that the front part is visible and not covered by dark glasses and shields.

“The system being created is fundamentally different from similar biometric facial authentication systems,” according to Vladimir Knyazkin, deputy chief engineer for production and technical support and quality at the Balakovo nuclear power plant. “In particular, most systems use mathematical algorithms for transforming an image or video of a person’s face, executed on the server side, which automatically transfers the system to the class of people processing and often storing biometric data. If in this system there is also recognition with the definition of personality, then these systems are classified in accordance with 152- FZ.”

Source: “Rosatom figured out how to recognize faces without regard to the law on the protection of personal data” [«Росатом» придумал, как распознавать лица без оглядки на закон о защите

персональных данных], CNews, July 26, 2022, https://www.cnews.ru/news/top/2022-07-26_v_rosatome_pridumalikak.

EFFORTS TO ELIMINATE ILLEGAL MISINFORMATION BY ROSKOMNADZOR CONTINUES

According to a new article at *Izvestiya*, Russian authorities are planning to develop new tools to “control the spread of fakes using IT systems.” Subordinate to Roskomnadzor, the Main Radio Frequency Center (MRFC) is looking for a developer of an information system that will allow finding on the Internet “facts of the dissemination of socially significant information under the guise of reliable messages.” The institute is offering 60 million rubles for a company to develop such a system, which they are terming “Vepr” (i.e., “Vapor”).

Among the tasks of the system are also “identification of negativity, insults in relation to a given subject and object composition” within certain topics, identification of the dissemination of false information on these topics, and purposely conducted information campaigns. The new system should help identify negative and insulting public disinformation campaigns, assess the degree of influence of fakes on the audience, and so on. Today, the market already has algorithms for searching for primitive fakes, but such solutions still require the participation of a live moderator, according to experts that *Izvestiya* interviewed. However, “only a person can still reveal ingeniously presented false information, for example, related to the manipulation of statistical data.” The idea is to automate the analysis of publications in the media and social networks, as well as user comments, for the content of information that violates applicable law. After identifying such publications, two scenarios are possible: either the interaction of the department with the platform to force the removal of content, or the initiation of cases against the authors of the content.

Vepr is not the only IT system that an enterprise subordinate to Roskomnadzor orders to automate the detection of illegal content on the Web. The MRFC announced a competition for the creation of the Oculus information system, which, using artificial intelligence, will identify images and video materials that violate Russian law. The system, which is not yet operational, is expected to analyze at least 200,000 images per day with an error of no more than 20%. Algorithms should identify, among other things, materials with signs of terrorism and extremism, calls for riots, and insults to Russian state symbols and authorities.

Source: “Robot schedule: fakes on the Web at the request of the authorities will find an algorithm” [График робота: фейки в Сети по запросу властей найдет алгоритм], *Izvestiya*, July 26, 2022, <https://iz.ru/1370015/valerii-kodachigov/grafik-robota-feiki-v-seti-po-zaprosu-vlastei-naidet-algorithm>.

FIRST “SERVICE ROBOT” DEALERSHIP PROPOSED IN STAVROPOL

Negotiations among regional authorities are ongoing over a new “service robot dealership” being established in Stavropol region, which would be the first in all of Russia. The goal is for service robots to appear in large shopping centers and catering facilities. According to Denis Polyubin, the chairman for the region’s committee for food and the processing industry, trade,

and licensure, “Innovative robots can act as waiters, entertain visitors by talking to them and demonstrating goods without additional involvement of specialists. Robots are able to move along a given trajectory, while they see obstacles that may arise in their path. This is a great way to advertise, hold promotional action and more.” The negotiations are using the federal Ministry of Economic Development’s new concept for regulating artificial intelligence and robotics technologies, which is still in draft form.

Source: “The first dealer center of service robots in Russia is planned to be opened in the Stavropol Territory” [Первый в России дилерский центр сервисных роботов планируют открыть на Ставрополье], TASS, July 25, 2022, <https://tass.ru/ekonomika/15307055>.

INDUSTRIAL PRODUCTION SYSTEMS CONTINUE TOWARDS IMPORT-SUBSTITUTION SOLUTIONS

Industrial production is about to begin for AI-enabled network equipment using domestic software in line with import-substitution requirements. Production is being carried out by the “Shokin” Istok, a research and production enterprise, and is using the “Basis” and “BAUM AI” AI platforms

Basis.Digital Energy is a DevOps pipeline based on a dynamic infrastructure that allows for the organization of a full cycle of development and testing of software products, as well as the creation of a scalable, secure infrastructure that can handle various types of workloads, including containers, large archives, virtual machines, and applications. BAUM AI, meanwhile, is a product that contains a unified BAUM storage system and an applied artificial intelligence platform. BAUM AI uses a combination of an optimized hardware platform and proprietary software that allows the user to save data and create, train, or use pre-trained AI models without the need for direct drag and drop coding.

Andrey Tyurin, the head of the scientific-technical design center at Shokin Istok, stated that “demand for Russian telecommunications equipment has been growing since 2014, and now the need for such equipment has become a recognized necessity.” He continued:

Companies are faced with the question of how to build reliable networks based on domestic equipment, and we can solve this problem. We started a pilot project for the production of communication systems hardware in Fryazino back in 2020, and it turned out to be very successful. Now we are planning to launch industrial conveyor production of switches and routers with our own software. Initially, we ordered software from a contractor, but then decided to develop independently. To do this, we needed a platform that could allow us to “land” the development with us, and the best such solution was Basis. Digital Energy and BAUM AI products.

Source: “Russia will launch the production of AI-enabled network equipment on the Basis platform” [В России запустят производство сетевого оборудования с поддержкой ИИ на платформе «Базис»], CNews, July 25, 2022, https://www.cnews.ru/news/line/2022-07-25_v_rossii_zapustyat_proizvodstvo.

INTERVIEW ABOUT AI DANGERS WITH RUSSIAN THEORETICAL MATHEMATICIAN

Dmitry Novikov, the director of the Institute for Control Problems of the Russian Academy of Sciences, and academician of the Russian Academy of Sciences was interviewed at AI-News, where he talked about why artificial neural networks are not used in control systems for critical facilities, as well as what he considers to be the primary danger from “unhealthy hype” around artificial intelligence.

The interview focuses heavily on AI in mathematical theory and modeling methodologies, but also discusses where AI shines and falters, in Novikov’s view. He states, “Why are artificial neural networks not used in critical facility management systems? Because no one can guarantee that the control system will not take this object out of the allowed area. That is why there are no neural networks in aviation, at nuclear power plants, in many production systems. The problem of trusted (explainable) artificial intelligence is an interesting scientific problem from the point of view of mathematics and many people are working on it, but there is still work and work to be done on its solution.”

He also notes that his doom and gloom is not total, although it is significant: “Of course, artificial neural networks are successfully used in many areas, including in our developments, but I’m talking about the harm caused by the hype that is created around this term. The main danger here is civilizational and educational. Indeed, if we have a totally accepted model-free approach, then why do we need to study physics, chemistry, biology and even mathematics at school. Instead, we will “set up the grid,” as the youth say now, and they will figure it out on their own. As a result, a very disturbing structure of knowledge and competencies is emerging in this area.”

He makes a point that there is a problem of quality in people working on AI issues, as well:

There are several thresholds for entering the subject area associated with artificial intelligence (more precisely, with artificial neural networks). The first threshold is very low. This is the level of the user of computer programs, for which there is enough knowledge in the volume of the senior classes of the physics and mathematics school. It is enough to select the parameters and modify the program in Python. The next threshold, which is also low, requires a level of knowledge of 2-3 courses of an engineering or mathematical university: write a program yourself, select (find on the Internet) data for machine learning. And the next level is already deep, truly scientific work, which gives a significant increase in the quality of system solutions, including proving theorems and the like. One hundredth of a percent goes to this level, and all the rest are hustled at the two lower “craft” levels. But at the same time, they and the inhabitants around them have the illusion that they are doing science and promoting artificial intelligence. And the saddest thing is that this same illusion is created not only among ordinary people or journalists, but also among those who allocate money for relevant research and determine what should and should not be taught to the younger generation. And now very influential people are already declaring that we do not need mathematical schools

or that physics should not be studied in an ordinary school. That's the scariest thing: that we don't need mathematical schools, or that ordinary schools don't need to study physics. That's the scariest thing."

Source: "A very disturbing structure of knowledge and competencies is emerging around artificial intelligence—academician Novikov" [Вокруг искусственного интеллекта складывается очень тревожная структура знаний и компетенций, – академик Новиков], *AI-News*, Aug. 1, 2022, https://ai-news.ru/2022/08/vokrug_iskusstvennogo_intellekta_skladyvaetsya_ochen_trevozhnaya_struktur.html.

PROBLEMS WITH DIGITALIZATION IN RUSSIAN COMPANIES

The results of a joint study of the Bitrix24 online service and Develika (Softline Group of Companies) revealed a discrepancy between the desire of Russian companies to digitalize business processes and real progress in this direction. The study finds that almost 9 out of 10 Russian companies are confident that digitalization improves work efficiency, but only 52% implement modern software to speed up business processes. The gap between the awareness of the need for modern digital tools and their real integration is also confirmed by the fact that 71% of respondents do not believe that all processes in their company are well digitalized.

Izvestiya interviewed a number of IT managers in light of these findings. Some point out that there is a misunderstanding that digitalization is "impossible without large investments," while others are more pessimistic and note that there is simply "low investment and a lack of personal initiative among company leaders. This is argued to be a consequence of fears by top management that major changes resultant from digitalization could significantly affect the organizational structure of a given company in a negative way.

One interview with Evgeny Mineev, the executive director of the Reksoft IT company (part of the Interros group), notes that the digitalization of business is, first of all, the digitalization of end-to-end business processes of the entire enterprise, and then their digitalization with the integration of previously implemented systems. "Most often, this requires restructuring current business processes, which is always painful. In addition, the company must have a leader who oversees this process. It is best if this is one of the first persons of the enterprise, otherwise the process often fades."

Many note the difficulty of mixing the harsh economic conditions of sanctions, the restrictions of the import-substitution policies (and the reality of Western companies ending business in Russia), with the need for appropriate budgets to build out new digitalization plans. An interview with Mikhail Gribov, a managing partner at the IT Expert corporate group, pointed out that "it is very difficult for companies to receive grants [that would ease this transition], as such support reaches only a few. [Furthermore], it will be possible to supplement the digitalization effort only by increasing pressure on banks, otherwise there will be no breakthroughs in import substitution. Any development requires credit money and preferential interest. In addition, it is necessary to speed up the work of grenade structures, now everything is being done very difficult and for a long time."

Source: "There are no intentions: why Russian companies are not digitalized enough" [Намерений немерено: почему российские компании недостаточно цифровизированы], *Izvestiya*, Aug. 5, 2022, <https://iz.ru/1374356/aleksandr-lesnykh/namerenii-nemereno-pochemu-rossiiskie-kompanii-nedostatochno-tcifrovizirovani>.

HUMAN CAPITAL

AI HACKATHONS AND EVENTS

There were several developments in AI-related hackathons and training events during this reporting period, the most notable of which are mentioned below:

- Regional championships of the Digital Breakthrough series were completed in Dagestan and Orenburg at the beginning of August. Participants in the Dagestan region developed AI solutions to prevent traffic accidents, while participants in Orenburg developed AIs to predict which online classes a student will select. The fifth of eight district championships will be held August 25-27 in St. Petersburg. Participants in this championship will be tasked with developing an algorithm to predict Russia's economic stability as well as developing a digital legal assistant that can classify paragraphs of legal documents. These are part of the "116 AI hackathons by 2024" series.
- The 2022 Baltic Forum: Neuroscience, Artificial Intelligence and Complex Systems will be held in Kaliningrad, Russia, at the Immanuel Kant Baltic Federal University on September 14-16. The Forum will consist of two conferences: one on "Neurotechnologies and Neural Interfaces," which will address topics including cognitive, computational, and systems neuroscience, brain-computer interfaces, and neural sensor networks, as well as a conference on the "Dynamics of Complex Networks and their Applications."
- According to a TASS article, the first test games for the 2024 Games of the Future event are being held on September 18-24, 2022. Competition will be held in four disciplines: digital football, digital basketball, Beat Saber (a popular VR game where participants break geometric shapes to the rhythm of the music in order to score points), and drone racing.

Sources: "Digital Breakthrough" [цифровой прорыв], accessed Aug. 16, 2022, <https://hacks-ai.ru/>; "BF-NAICS 2022," BF-NAICS, <http://bfnaics.kantiana.ru/>, accessed Aug. 16, 2022; "The first test competitions of the Games of the Future will be held from 18 to 24 September" [Первые тестовые соревнования "Игр будущего" пройдут с 18 по 24 сентября], TASS, July 28, 2022, https://tass.ru/sport/15334739?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com.

SCIENTISTS CREATE AI TO DIAGNOSE EPILEPSY BASED ON EEG RESULTS

According to an August 4 TASS article, a group of Russian scientists have developed a neural network that can diagnose non-convulsive epilepsy based on electroencephalography (EEG)

results. According to the report, this is the first time in the world that the theorem of extreme values—a mathematical method that allows one to characterize abrupt and large-scale changes—was used to solve such a problem. Previously, the theorem of extreme values has been used to determine the likelihood of tornadoes, pandemics, or forest fires. The project team’s method also reduces the EEG recording time from one hour to five minutes. The team includes scientists from St. Petersburg State University, N. I. Pirogov National Medical and Chemical Center, Innopolis University, Immanuel Kant Baltic Federal University and employees of the research and development company Immersmed. The neural network is 80% accurate, and the team will continue to train it until it reaches 95% accuracy, when it will be used in hospitals and research centers.

Source: “St Petersburg University has created a new program for diagnosing epilepsy” [В СПбГУ создали новую программу для диагностики эпилепсии], TASS, Aug. 4, 2022, <https://nauka.tass.ru/nauka/15397213>.

NUST MISiS SCIENTISTS DEVELOP ALGORITHMS TO FURTHER DEVELOP QUANTUM RESEARCH

According to a July 26 TASS article, physicists from Russia’s National University of Science and Technology (NUST MISiS) have developed a library of algorithms that will enable the rapid development of quantum applications. These may include computing systems that solve complex problems, including breaking the RSA cipher using the Shor algorithm, which the team says “is now considered one of the top priorities for quantum computers.” The team’s findings were published in the scientific journal *PLOS One*.

Source: “A library of algorithms has been created in Russia for the accelerated development of quantum applications” [В России создали библиотеку алгоритмов для ускоренной разработки квантовых приложений], TASS, July 26, 2022, <https://nauka.tass.ru/nauka/15312945>.

RUSSIAN GOVERNMENT PROVIDES ALMOST 1 BILLION RUBLES FOR TWO AI TRAINING INITIATIVES

According to several articles, a decree was signed by Prime Minister Mikhail Mishustin on July 26, 2022, providing almost 1 billion rubles (\$16.529 million) in funding to two AI training initiatives.

First, the decree issues 575 million rubles to University 2035 over the next three years. A large part of this funding will go towards a one-year remote training program starting on September 1, 2022. Classes will be held in a remote format, and offer instruction on data analysis, data engineering, technical analysis, AI development, and data architecture. The one-year course will cost 95,000 to 110,000 rubles per person, with Russia financing up to 85,000 rubles per person. It is expected that by 2024 more than 6,400 people will improve their qualifications under this program. The “University of the National Technology Initiative 20.35” was created by the Agency for Strategic Initiatives in 2017.

Second, the government will also subsidize AI-related education for students in grades 7-11. A sum of 415 million rubles was allocated to the creation of free online classes which will teach students the basics of AI and programming. The programs will be operated by the President's Talent and Success Foundation. Students who produce the best projects will be invited to compete in a championship held at Sirius Educational Center. The government expects that at least 100,000 schoolchildren will take these courses from 2022 to 2024.

Earlier, the Cabinet of Ministers also decided to subsidize the computer science training program for students in grades 8-11.

Sources: "The Government of the Russian Federation will subsidize the training of specialists in the field of artificial intelligence" [Правительство РФ просубсидирует подготовку специалистов в сфере искусственного интеллекта] Interfax, July 26, 2022, <https://www.interfax.ru/digital/853848>; "The government will allocate a billion rubles for training in AI technologies" [Правительство выделит миллиард рублей на обучение ИИ-технологиям], CNews, July 26, 2022, https://www.cnews.ru/news/top/2022-07-26_pravitelstvo_vydelit_milliard; "The Cabinet of Ministers will pay for advanced training of specialists in the field of artificial intelligence" [Кабмин оплатит повышение квалификации специалистов в области искусственного интеллекта], TASS, July 26, 2022, <https://tass.ru/ekonomika/15310333>.

INTERNATIONAL COLLABORATION

NEW ROUND OF US SANCTIONS HITS RUSSIAN HIGH-TECH SECTOR

On August 2, 2022, the US Office for Foreign Assets Control (OFAC, a division of the US Department of the Treasury) included several high-tech organizations on its sanctions lists (SDN, Specially Designated Nationals List). Specifically, OFAC included the Skolkovo Foundation, which supports technology entrepreneurship; the Skolkovo Technopark, which hosts startups; and Skoltech, which develops innovative technologies. This threatens organizations with limited access to American technologies and can seriously complicate the development of telecom equipment on an open interface, as well as for 6G communications. For the development of these technologies, global cooperation on technical standards and frequency selection is important. Inclusion on the SDN list closes access to American suppliers, prevents any purchases in dollars, and forces a change in the pool of counterparties and supply chains.

The United States also imposed sanctions against the Moscow Institute of Physics and Technology (MIPT) for participating in development projects for the Russian military. The US authorities note that MIPT is involved in the development of unmanned aerial vehicles, "imaging systems" for fighter aircraft, the presence of a laboratory that works in support of the Russian military space sector, and participation in the training of specialists for the country's military-industrial sector.

Also on the new American "black" list are dozens of universities, research centers, and factories specializing in the development and production of radio engineering products and microelectronics. The list includes the following:

- The Mints Radio Engineering Institute
- NPK "Technological Center," which develops and manufactures analog-digital and digital integrated circuits for special applications, including those based on basic matrix crystals
- The Institute for System Analysis of the Russian Academy of Sciences, which works on nanotechnology and information technology
- The "Design and Technology Center of Electronics," which produces semiconductors and programmable logic integrated circuits
- Progress Research Institute of Microelectronics, the leading design center in Russia for the development of base elements for microelectronics
- the Bruk Institute of Electronic Control Machines, the creator of domestic servers based on Elbrus processors
- Penza Research Electrotechnical University,
- Penza Research Institute of Electronic and Mechanical Devices,
- JSC "Perspective Industrial and Infrastructure Technologies"
- Vologda Optical and Mechanical Plant
- Voronezh Plant of Semiconductor Devices-Assembly
- Research Institute "Submicron"
- Zelenograd Nanotechnology Center
- Scientific and manufacturing enterprise "Digital Solutions," a center for the design of electronic equipment
- Mytishchensky Research Institute of Radio Measuring Instruments
- Research Institute of Precision Engineering
- NPP Pulsar, which develops semiconductor electronics
- the Research and Production Association of Measuring Equipment

In October 2020, the Skolkovo Institute of Science and Technology, together with MTS, launched a pilot 5G network on the territory of the Skolkovo Innovation Center. It is designed to test developments in the field of 5G technologies and create domestic advanced industrial information and communication solutions and services based on them with the involvement of Skolkovo residents and industrial partners of Skoltech. Also, Skoltech, together with the Radio Research Institute (FSBI NIIR), subordinate to the Ministry of Digital Development, recently announced the start of work on 6G cellular networks, with a target of developing a domestic variant by 2025.

Industry representatives are most concerned about the situation with the development of telecom equipment, such as solutions based on OpenRAN open interfaces for 4G and 5G base stations. The institute also develops OpenRAN standards at the international level as part of the O-RAN

Alliance. Against the backdrop of withdrawal from Russia—due to sanctions by Western manufacturers of telecom equipment from Nokia and Ericsson and the suspension of supplies from the Chinese Huawei—OpenRAN may allow Russian developers to use compatible components and technologies from foreign vendors. The sanctions will complicate the work of the organization on solutions in OpenRAN. Anton Imennov, senior partner at Pen & Paper Bar Association, explained that inclusion in the sanctions list closes Skoltech access to US suppliers and any dollar-denominated purchases, which will result in Skoltech having to change counterparties and modify supply chains.

Experts and participants in the telecom market interviewed by Kommersant believe that the sanctions will complicate the work of Skoltech both on the project to develop 6G equipment and on current solutions in OpenRAN. 6G requires huge resources, and first of all, qualified personnel, as well as international cooperation in terms of harmonizing frequencies and technical standards that are being developed globally. According to one anonymous expert, “It is impossible to create equipment in this standard without participating in this process.” In addition, Skoltech will no longer be able to participate in the development of standards within the O-RAN Alliance, since participation in the organization is paid, and due to sanctions, it will no longer be able to accept payments from the institute.

Sergey Sukhman, the president of Zelax, a Russian company that produces telecommunications equipment, says that the sanctions imposed on Skoltech will make it difficult to purchase hardware, as well as components that will be required for the production of equipment. “But I think that Russian companies have already learned how to circumvent such restrictions. Therefore, work in this area will continue, although it will require additional financial resources.”

According to Kirill Lyakhmanov, chief legal counsel of the Intellectual Property Practice of the EBR law firm, the impact of sanctions on Skolkovo residents who do not receive Skolkovo grants will be minimal: “As a rule, such companies do not carry out trading operations with Skolkovo. Residents in this case use only provided tax benefits that are not subject to sanctions.” At the same time, the work of organizations that are part of the Skolkovo Research Center or that receive grants from Skolkovo will be complicated. “The main consequences will be the need to suspend investments in the fund before September 1, 2022, or else remove Skolkovo from the list of founders of the organization—otherwise there is a high risk of falling under secondary sanctions related to the ban on trading operations and money transactions of sanctioned entities.

Sources: Nikita Korolev and Yuliya Tishina, “Shards of former luxury” [Осколково прежней роскоши], *Kommersant*, Aug. 3, 2022, <https://www.kommersant.ru/doc/5492138>; “The United States imposed sanctions against the Moscow Institute of Physics and Technology” [США ввели санкции против Московского физико-технического института], *Ria-Novosti*, Aug. 2022, <https://ria.ru/20220802/sanktsii-1806799463.html>; “US introduces sanctions against Skolkovo and MIPT” [США ввели санкции против «Сколково» и МФТИ], *CNews*, Aug. 3, 2022, https://www.cnews.ru/news/top/2022-08-03_ssha_vnesli_v_sanktsionnyj.

RUSSIAN MINISTRY OF FINANCE INTRODUCES NEW TAXES FOR RUSSIANS ABROAD

The Ministry of Finance has introduced a proposal to tax the salaries of employees of Russian companies who have moved abroad. Currently, these employees do not have to pay any personal income tax on their salaries in Russia. Under the new proposal, they will be forced to pay 30% tax as non-residents. The Ministry of Finance formulation reads as follows: “Remunerations paid by domestic employer organizations to remote workers located outside the country are classified as income from Russian sources.”

The proposal will affect only non-residents—that is, Russian citizens who spent a total of less than 183 days in the country in a 12-month period. For residents, nothing will change: they will continue to pay personal income tax rate of 13%. The personal income tax rate for non-labor income for non-residents is already higher—they must pay taxes on non-labor income received from Russian sources at a rate of 30%.

But with the labor income (that is, wages) of people working remotely in Russian companies and living outside of Russia, the situation is special: the Tax Code considers such income as being received from sources outside Russia, which means that they currently pay no personal income tax on such income. The Ministry of Finance wants to change this point. According to the ministry, “The amendments under consideration in the tax legislation fix only the specifics of the taxation of remuneration when performing work duties remotely outside of Russia. It is proposed to establish that payments by Russian employers to employees for the performance of such duties are taxable as income from sources in Russia.”

When an employee moves outside of Russia, the employer ceases to be his tax agent from the moment the employee receives the appropriate notification. From that moment on, the person must notify the Federal Tax Service of income and pay taxes on his own. If an employee has ceased to be a resident of Russia, this must be indicated in the declaration—then personal income tax will be charged at an increased rate of 30%. There is no separate responsibility for not notifying the Federal Tax Service of the status of a tax resident—but if someone declares income as a Russian resident, and the tax office somehow finds out that they have ceased to be one, the tax will be additionally assessed.

Whether the Federal Tax Service can establish the resident status of a taxpayer on its own is questionable. In theory, if the Federal Tax Service wants to, it can establish taxpayer status with the help of the border service, asking it for information on how many days a person spent in Russia. But the fact of arrival and departure from Russia is very difficult to assess, since departure from Russia can occur in a registered manner (through an airport) or in an unregistered manner (for example, leaving by car to Belarus or Kazakhstan). Therefore, in reality, the Federal Tax Service cannot take the border service database and automatically determine the tax status from it.

This modification will not affect tax rates for the self-employed, who pay a special tax on professional income at a rate of 4% or 6%. Changing tax residency does not change their tax rate.

The goal of this innovation is to capture lost tax revenues from specialists capable of working remotely, primarily in IT, who began to leave Russia after the start of the Ukraine war. The exact number of those who left is unknown, and it is impossible to calculate it without detailed data from the FSB. In an interview with Meduza in May, Yulia Florinskaya, a demographer from the RANEPa, estimated the total at around 150,000 people.

Only four days after the start of the war, the Ministry of Digital Development proposed a package of measures designed to stop the emigration of IT specialists, from deferrals from the army to subsidized mortgages. On May 17, Digital Development Minister Maksut Shadayev reported on the success of the benefits program, saying that according to the Big Four mobile operators, 80% of Russian SIM card holders who left the country at the end of February have already returned. However, the introduction of the tax code change suggests that this rate of return is overstated and that the topic remains an area of concern for the Russian government. The threat of a sudden increase in the tax burden from 0% to 30% may be more effective than the offer of subsidized mortgages. One expert suggested, "It will be extremely difficult to get away from the rule, and now employees will think about whether to leave or not. This is how their income decreases. Perhaps this is how the authorities want to stop the outflow of personnel, since it is unlikely that the number of people leaving can significantly replenish the treasury."

Source: Aleksandra Chunova, Petr Mironenko, "Pay an extra 30% in taxes: the Ministry of Finance has figured out how to return IT specialists to Russia," [Доплатите 30% налогов: Минфин придумал, как вернуть айтишников в Россию], The Bell, July 31, 2022, <https://thebell.io/doplatite-30-nalogov-minfin-pridumal-kak-vernut-aytishnikov-v-rossiyu>.

RUSSIAN TECH EXPORTERS ADAPTING TO SANCTIONS REGIME

Against the backdrop of American and European sanctions, Russian software companies rely on working with "friendly" countries. This is evidenced by the results of a survey by the Russoft Association, which it conducted from February to May 2022 among 171 Russian software companies with a total turnover of about 100 billion rubles. The survey results show that Russian software developers are gradually reorienting deliveries to Asian countries and the Middle East.

Russian companies are seriously interested in South and East Asia, South and Central America, and the Middle East. The share of those wishing to enter new markets in South and East Asia in 2022 increased from 5.3% in 2021 to 9.6%. Interest in India increased from 2.4% to 7.2%, even among service companies whose main business is custom software development.

In 2021, the Middle East accounted for 3-5% of sales of Russian software companies.

Of the survey participants, 8.4% want to work in the Middle East; the figure has doubled. Russian software developers are also not averse to making their debut in South and Central America—7.8% of companies expressed such a desire, compared to 4.9% in 2021. On the contrary, interest in the markets of the post-Soviet countries has fallen—companies want to work actively only with Uzbekistan. Also, judging by the survey, 26% of companies that were not involved in export in 2021 now plan to enter foreign markets.

At the same time, only 3% of the developers surveyed planned to enter the European market in 2022, down from almost 8% a year ago. For the US and Canadian market, the figure fell from 6.8% to 1.8%. Russoft analysts specify that sales of domestic software developers in Western markets will continue but will be conducted through representative offices in neutral countries and not on behalf of Russian companies. In order to sell their products in Europe and the US, some companies are registering legal entities in neutral countries, so they can bypass sanctions and stay in familiar markets. In the spring of 2022, Russian developers began to actively open offices in third countries—Armenia, Turkey, Kazakhstan, Montenegro, Uzbekistan, Georgia, and the United Arab Emirates. According to a representative of the Russian software market, “Everyone who works with Europe is actively disguised as local companies.”

Russoft analysts attribute the change in priorities of Russian developers to the influence of sanctions, which have seriously affected the work of Russian IT companies with clients from “unfriendly” countries.

Russoft provides an approximate distribution of sales of Russian software companies in 2021 by macro regions. Russia accounted for 50% of sales; the Near Abroad, for 8-10%; the US and Canada, for 13-15%; and Europe, for 12-13%. The share of South and East Asia reached 5-7%; the Middle East, 3-5%; South and Central America, 2.5-3%; and Africa and Australia, 1% each. According to Dmitry Makhlin, director of development of the HRlink electronic personnel document management system, “Today, the MENA region and India can be called the most promising markets.”

But they are not suitable for every product. With the HRlink product, the company wanted to enter the UAE market, which attracted favorable conditions for start-ups and free trade zones with other countries, such as Saudi Arabia. According to Makhlin, this market has recently been of great interest to IT manufacturers. However, it turned out that the chosen direction for the product was not suitable. There were several reasons: the low level of digitalization and an excess of cheap labor. As a result, local businesses did not see the value of certain solutions.

“Another country that we considered for expansion is Armenia,” Makhlin shared. “You can enter with a Russian passport and stay there for up to six months, there is no language barrier and minimal bureaucracy for non-residents. Registration of a company takes only a few days, you can open an account quickly, unlike Dubai, where it can take a couple of months. But the domestic market of Armenia is too small, and it is unprofitable. Another option is to establish an office in Armenia as a hub for reaching the international level, especially in English-speaking countries. We plan to develop in this direction.”

IW Group President Alexei Sinitsa notes that the company plans to continue to interact with Uzbekistan and Abkhazia and is eyeing the BRICS countries, and South and East Asia. Sergey Ozhegov, General Director of Searchinform, noted that the company has been working in Asia and Latin America for a long time, but recently active cooperation has been established with Turkey. “Certainly, there are enough difficulties for international expansion,” says Ozhegov. “In Asian countries, there is a language barrier that can serve as an obstacle to entering the markets.

In South America, the sales cycle is longer than in Russia due to the specifics of the mentality. We expect that the discussed state support measures will start working in the near future and will help level these difficulties. The institute of digital attachés' platform promotion of products will facilitate promotion both for those companies that are already active abroad, and for new companies that are just looking at this opportunity."

Source: "Due to European sanctions, Russian programmers are preparing their software for export to Africa, Asia and the Middle East" [Из-за европейских санкций российские программисты готовят свое ПО к экспорту в Африку, Азию и на Ближний Восток], CNews, Aug. 5, 2022, https://www.cnews.ru/news/top/2022-08-05_rossijskie_razrabotchiki.

US COMPANIES USING RUSSIAN FACIAL RECOGNITION SOFTWARE DESPITE SANCTIONS

According to Business Insider, several dozen US companies have obtained a license to use FindFace's Russian facial recognition software, despite having officially supported sanctions on Russia. The list of US companies using the Russian FindFace software includes some well-known brands, such as Bosch, Dell, Intel, Honeywell, Philip Morris, and SpaceX, as well as the Finnish company Nokia.

FindFace is a product developed by NTech Lab that detects faces in video streams in real time, checks them against monitoring lists, and sends notifications when a match is found. The product can be integrated with external systems and services, such as access control systems, cash registers, and monitoring systems.

However, it is not clear whether the list includes clients who obtained licenses before the implementation of the sanctions regime. Many US companies cited as NTech Lab clients deny that they are currently associated with the Russian developer. For example, representatives of Philip Morris claim that while the company considered the possibility of integrating FindFace into its systems in 2017-18, it eventually abandoned this idea in favor of a similar system from another developer. Intel flatly refused to acknowledge the use of NTech Lab software. Finnish Nokia did the same.

Source: "Despite sanctions, Intel, SpaceX and Philip Morris bought Russian facial recognition software" [Санкциям вопреки, Intel, SpaceX и Philip Morris закупили российский софт для распознавания лиц], CNews, Aug. 1, 2022, https://www.cnews.ru/news/top/2022-08-01_sanktsiyam_voprekiintelspacex

IMPORT SUBSTITUTION PROGRESS REPORTED IN ROBOTIC PROCESS AUTOMATION

According to a forecast by the IBA software company, more than 90% of Russian companies using robotic process automation (RPA) systems will switch to domestic software by 2024, allowing the domestic business process robotization market to grow by 40-50% annually. The mass transition will affect both public and private companies. In the next two years, the Russian market for RPA systems will grow even faster than during the pandemic. In 2019 it was

estimated at 1.5 billion rubles; in 2021, at 16 billion rubles. By 2024, according to IBA experts, its volume may grow to 60 billion rubles. Similar growth dynamics of the RPA systems market is observed all over the world.

The transition to local software is caused not only by geopolitics. The solutions existing on the market are cheaper than analogues and are pegged to the ruble. The implementation of the project, even taking into account the “migration” to another RPA system, will bring at least twofold savings in the future. Russian companies also expect to avoid the risks associated with the renewal of licenses. Migration to domestic robots is already underway in many sectors, with banks, transport companies, large manufacturers, telecom operators, and retailers being the most active.

According to the IBA IT company, Russian RPA solutions such as the Chancellor RPA platform are not inferior in functionality to Western products. The enterprise-class platform is used to develop, maintain, and modify robots. The main advantage when compared to Western vendors is the cost of implementation. When purchasing a program from the register of domestic software, customers do not need to pay VAT. Also, with turnkey automation, there is no license fee, and automation becomes two to three times cheaper than use of foreign vendors. Platforms such as Chancellor RPA have no functional limitations for automation, since processes are built not in a visual editor but with code. Even nonstandard actions can be easily implemented with ready-made tools, and the methodology for developing common modules greatly simplifies the support of business processes working with the same systems. Integration with third-party software and built-in ML/OCR mechanisms is also important.

Source: “By 2024, 90% of Russian companies will use domestic robotic software” [К 2024 г. 90% компаний в России роботизируются отечественным софтом], CNews, Aug. 5, 2022, https://www.cnews.ru/news/line/2022-08-05_k_2024_g90_kompanij_v_rossii

YANDEX MAY SPLIT INTO TWO COMPANIES

According to The Bell, Yandex may be divided into two companies, with new shareholders and a new management structure. This would allow its founder, Arkady Volozh, to independently control part of its assets abroad, independently of the original company. At the same time, Volozh would cease to control the company's business in Russia. The head of the Accounts Chamber, Alexei Kudrin, is helping Volozh implement this plan.

After the start of the war, the Yandex top management team was divided into those who decided to stay in Russia and save the Russian Yandex, and those who left. Volozh himself has been living in Israel for several years. Several executives of the company moved there after February 24: Elena Bunina, at that time the general director of the Russian Yandex; the head of geoservices, Roman Chernin; the head of drones, Dmitry Polishchuk; and the director of advertising products, Vera Leizerovich.

Over the past few months, the company has been discussing whether it is possible to separate from Yandex several projects, including drones, clouds, and the Yandex.Practice educational project. The exact list has not yet been determined, says one of The Bell's interlocutors: for

example, the possibility of adding “Maps” and “Navigator” to it was also discussed. It is assumed that successful businesses in Russia will continue to develop domestically, but the company will somehow share the rights to their work abroad. The parties are discussing how to divide the development teams, under what conditions to transfer rights, and most importantly, who will continue to control the Russian Yandex.

The last time the management structure of Yandex changed was at the end of 2019, after a conflict with Sberbank, which wanted to become a major shareholder of the company in order to “marry” its ecosystem with Yandex services. Since 2009, Sberbank has owned the “golden share” of Yandex, bought for a symbolic €1. It gave the state bank the right to block the purchase of more than 25% of the authorized capital or votes of the company by any of its shareholders or a third party, as well as the sale of all or a significant part of the company's assets to a third party. For the state, this system ensured that Yandex would not become controlled by foreign shareholders. The conflict between Yandex and Sberbank in 2019 ended in a divorce in joint projects and the surrender of the “golden share.”

At the same time, in agreement with the Kremlin, Yandex set up a new management structure. A new “golden share” of the parent company of Yandex, the Dutch Yandex N.V., was received by a specially created structure called the Public Interest Fund. With its help, the fund received the right to block any transactions with more than 10% of the shares of an IT company and appoint two directors to the board of directors of Yandex. The founders of the fund included representatives of five universities, the Skolkovo School of Management, and the Russian Union of Industrialists and Entrepreneurs. Also in the management of the fund were people who could get along with the Kremlin: Alexander Dyukov, chairman of the Board of Gazprom Neft; Elena Shmeleva, head of the Sirius Center, which was founded by a friend of Vladimir Putin; and cellist Sergei Roldugin. Volozh was left with 48.4% of the voting shares (now down to 45.3%), but transferred them to a family trust and agreed not to sell for at least two years. Together with the management of Yandex, the trust continued to control 57.7% of the votes.

In 2020, as part of the divorce from Sberbank, VTB Capital, the investment company of Roman Abramovich and the investment companies of his Evraz partners Alexander Abramov and Alexander Frolov became minority shareholders of Yandex (their economic share in the capital of Yandex N.V. at the time of the transaction was about 5%; voting, about 2.5%).

The main unresolved question in the current scheme is who will control Yandex going forward.

According to two sources of The Bell who are familiar with the negotiations, if the deal to transfer the rights to develop part of Yandex's projects abroad to Volozh goes through, he will lose control of the remaining business.

Instead of the Dutch Yandex N.V., the Russian business of “Yandex” would likely have a new parent company. Its shareholders might include a pool of investors, each of whom individually owns a small stake in the company. Among the possible participants in this pool, sources name Roman Abramovich, Vladimir Potanin and other Russian businessmen who have enough free funds, although representatives of Abramovich have stated that he is not involved in the process.

The question of who will control the company is being actively discussed. One option is to leave control to top management. In mid April, Artem Savinovsky, head of media services, was appointed head of Yandex in Russia instead of Tigran Khudaverdyan, who fell under sanctions. Khudaverdyan resigned from all posts, but remained a member of the collegial management body, which includes several top managers. From the point of view of managing Yandex, control over strategic decisions may remain with the Public Interest Fund or a specially created similar structure. Now the fund is an add-on for managing the Dutch Yandex. In the event of a deal, it can retain these functions for the business, which will remain in Russia, while Volozh with his projects can remain in the Dutch company. But there is no final scheme yet; moreover, such a reorganization still has to be supported by the remaining shareholders of Yandex, including large Western funds.

The state had to agree on all these changes and the legitimacy of restructuring with the allocation of foreign projects. Volozh asked Alexei Kudrin—the former head of the Ministry of Finance, the head of the Accounts Chamber, and a longtime acquaintance of Vladimir Putin—to act as an intermediary.

In mid June, Kudrin went to a meeting with Vladimir Putin. In the open part of the meeting, they discussed in detail the work of the Accounts Chamber; in a closed meeting, they talked about Yandex. But the details of the restructuring will have to be discussed with the deputy head of the presidential administration, Sergei Kiriyenko, who is considered Yandex's curator in the Kremlin. Whether Kudrin will be able to agree on the proposed scheme is still a question. Kudrin is not just a negotiator. It is assumed that he will enter the management of Yandex, leaving his post in the Accounts Chamber. He may head the “Public Interest Fund” or the structure that will replace it. As a reward, Kudrin could receive shares in Yandex or options.

Source: Valeriya Pozychanyuk, “Control of the largest IT company may change” [В крупнейшей IT-компании может смениться контроль], The Bell, July 31, 2022, <https://thebell.io/bolshie-peremeny-v-yandekse-knut-dlya-aytishnikov-i-kak-bigtekhi-gotovyatsya-k-retsessii>.

CHINESE COMPANY MAY PROVIDE ALTERNATIVE MICROPROCESSORS FOR RUSSIA

The Chinese contract chip manufacturer SMIC has been accused of copying TSMC’s chip manufacturing technologies. This conclusion was made by experts from the analytical company TechInsights after studying the structure of the SMIC MinerVa chip.

TSMC is the world's largest chipmaker, with orders from AMD, Apple, Qualcomm and a host of other world-renowned companies. In the first quarter of 2022, it controlled 53.6% of global chip manufacturing, leaving Samsung 16.3%, UMC 6.9%, Globalfoundries 5.9%, and China's SMIC 5.6%.

TechInsights, a company that engages in independent analysis of microcircuits, studied SMIC’s MinerVa ASIC chip and concluded that TSMC-owned technologies were used in its production. This is not the first case of this kind—TSMC has repeatedly sued its Chinese competitor for stealing

its technologies. It filed such lawsuits in 2002 and 2006, and the TechInsights statement could be the subject of new proceedings.

TechInsights indicates that SMIC is mass-producing 7-nanometer (nm) chips, although SMIC has not yet admitted this. In 2020, SMIC talked about preparations for the launch of small-scale production of such chips with the second-generation N + 1 FinFET process technology. There was no talk about large-scale stamping of microcircuits—officially, the company is concentrating on the production of 14- and 12-nm products.

SMIC's adaptation of TSMC's technologies to its needs may help Russian chip developers avoid sanctions, since TSMC has flatly refused to cooperate with them due to pressure from US authorities. Because of concerns about sanctions, TSMC was forced to refuse to cooperate with MCST, Baikal Electronics, and other Russian companies, just as in 2020 it stopped producing chips for Huawei. SMIC is already under US sanctions, so has nothing more to fear from the US. Under these conditions, Russian vendors could transfer orders to it that TSMC refused.

According to TechInsights, SMIC lags far behind TSMC and Samsung in terms of the sophistication of its 7-nm manufacturing. Analysts attribute the SMIC's lag primarily to US sanctions. In particular, the US authorities put pressure on the Dutch company ASML and banned it from supplying its equipment for EUV lithography to China. As a result, ASML will not export EUV equipment to China, which is used to produce chips according to modern standards, including 7 nm. At the beginning of July 2022, it also threatened to stop deliveries to China of DUV equipment used for less modern technical processes. However, such a step would result in serious losses for ASML, since China is the company's third largest market after Taiwan and South Korea and provides for 16% of total sales.

Source: "Russian processors given new hope. China has cloned TSMC chip technology" [Российским процессорам дали новую надежду. Китай клонировал технологии выпуска микросхем TSMC], CNews, July 25, 2022, https://www.cnews.ru/news/top/2022-07-25_rossijskim_protsessoram_dali.

HUAWEI STOPS ONLINE SALES IN RUSSIA

On August 1, 2022, Huawei stopped online sales of devices through the official Huawei VMALL online store. It did not state any reasons for the closure. At the moment, it is not known when the work of the store stopped, or whether it will be resumed. Previously placed orders will be delivered and products already purchased will be covered under warranty, Huawei said. The halt of online sales is a continuation of the closure of offline Huawei stores in Russia, which began in early July 2022. An unnamed RBC source then said that the reason for their closure lies in the lack of inventory in warehouses, as well as a decrease in demand for smartphones in Russia. As reported previously in issue 37 of *AI and Autonomy in Russia*, the company remains in an ambiguous position vis-à-vis the Russian market.

Source: "Huawei has closed its online store in Russia" [Huawei закрыла онлайн-магазин в России], CNews, Aug. 3, 2022, https://www.cnews.ru/news/top/2022-08-03_huawei_ostanovila_onlajn-prodazhi.

RESULTS FROM SAMSUNG IT ACADEMY REPORTED

The Samsung IT Academy social and educational program, which is part of the Samsung Innovation Campus global initiative, has completed another academic year. About 500 students from 26 Russian universities graduated from the program in three tracks: "Mobile Development," "Internet of Things" and "Artificial Intelligence."

During the first two months of the summer, graduation projects were defended at the sites of the Samsung IT Academy project throughout Russia. By the end of the training, students had prepared individual papers in one of the study areas: those who were trained on the Mobile Development track presented mobile applications in Java and Kotlin; those trained on the Internet of Things track presented systems that included a physical device or a set of devices; and those trained on the Artificial Intelligence track presented solutions based on a neural network, trained on a prepared dataset, and built into an applied software system. Of the students who completed the training, 48% were on the Internet of Things track, 34% were on the Mobile Development track, and 18% were on the Artificial Intelligence track.

Samsung IT Academy is a long-term educational project of Samsung, which provides an opportunity for university students to gain practical knowledge in the most popular areas of information technology. The three educational tracks being implemented are part of the project: the Internet of Things track began in 2017, and the Artificial Intelligence and Mobile Development tracks began in 2019. The courses of the Samsung IT Academy program were developed by specialists from Samsung Research Russia, consisting of the Samsung Research Center and the Samsung AI Center in Moscow. This year, the Mobile Development track introduced the opportunity to learn the Kotlin language. At the end of the year, 41 students were certified for this course (97 students took the Java course).

By the end of each academic year, graduates of the Samsung IT Academy will have independently developed individual projects; those who complete the program receive a certificate from Samsung. In addition, they participate in the annual inter-university project competition, the winners of which are determined by a jury consisting of Samsung experts and representatives of other leading companies in the IT industry. Projects are evaluated according to several criteria: idea, technical implementation, and presentation. The next competition will be held in the fall of 2022.

An open AI lecture hall continues to operate at the Samsung IT Academy. In total, it now has 24 lectures by Samsung experts and guest speakers. The Machine Learning Bootcamp was held on July 5-22; it is an online summer intensive program developed jointly with teachers from NRNU MEPhI. The three-week boot camp program includes the study of the Python programming language and libraries for working with data, the basics of machine learning, and the solution and detailed analysis of practical cases on the main AI competition platform, Kaggle.

To date, classes under the Samsung IT Academy program are being conducted in 26 universities, in Moscow, St. Petersburg, Volgograd, Yekaterinburg, Chelyabinsk, Novosibirsk, Tomsk, Irkutsk,

Vladivostok, Kursk, Voronezh, Ufa, Izhevsk, Kaliningrad, Rostov-on-Don, Komsomolsk-on-Amur, Sterlitamak, Ulyanovsk, and Arkhangelsk.

Source: “Samsung IT Academy sums up the results of the 2021-2022 academic year” [«IT Академия Samsung» подводит итоги 2021–2022 учебного года], Samsung press release, July 25, 2022, <https://news.samsung.com/ru/samsung-it-academy-sums-up-the-results-of-the-2021-2022-academic-year>.

SPOTLIGHT

RUSSIAN VOLUNTEERS AIM TO ORGANIZE AN EVENT TO TRAIN DRONE OPERATORS

Commercial quadcopters have played a critical role in the Ukraine war as artillery and MLRS spotters, intel platforms for situational awareness, and combat UAVs that drop munitions right on top of their targets. Despite the official ban on their sales in Ukraine and Russia, large numbers of Chinese-made DJI Mavic models are making it to the front lines for use by both Russian and Ukrainian soldiers in large numbers. Ukrainian and Russian volunteers alike have set up training to educate operators for the front lines.

Now, the pro-Russian Coordinating Center for Assistance to Novorossiya and its Telegram channel, along with other Telegram channels such as Game of Drones, are organizing an event called “Dronnitsa,” which will be held on September 1-5, 2022, at Lake Ilmen near Veliky Novgorod, Russia. The event will bring together commercial drone pilots from Russia and the Donetsk and Luhansk People’s Republics (DNR and LNR). According to the event description, the key issue for Russian, DNR, and LNR forces is the acute shortage of trained drone operators due to Ukrainian military’s success in finding and targeting these operators on the front lines. They argue that there is now a need to create a drone operation training program that can be scaled very quickly. These pro-Russian sources indicate that it is important to train not just UAV operators but also instructors capable of conducting training/retraining, i.e., a train-the-trainer program. They write that Dronnitsa’s main goal is to initiate the formation of an instructor corps. This will include establishing a new specialty—instructors in the combat use of UAVs—and creating a system for training these specialists.

Dronnitsa will feature three tracks: the exchange of experience among existing operators and instructors; a program for selecting potential instructors; and public events for people who are interested in the general topic of delivery, maintaining, and operating drones in war. Other goals include IT solutions for quadcopter-enabled combat, learning about UAV “smart swarm” and computer vision, and real-time geometric video analytics. The organizers also want to discuss a lab to coordinate decisions on combat quadcopter piloting, and to collect information and establish a production center for educational videos and online courses. Finally, organizers aim to create a video archive and a data bank for collecting videos from copters for pilot and AI/machine-learning training. This is the first event of its kind to involve pilots of commercial drones. The

Russian Ministry of Defense is likely to be involved, considering how many of its soldiers are now utilizing DJI and similar drones against Ukrainian forces.

Sources: Official Telegram channel of the Coordinating Center for Assistance to Novorossiya [Координационный Центр Помощи Новороссии], <https://t.me/kcprn2014/851>; Official "Game of Drones" Telegram channel, <https://t.me/droneswar/2750>.

This report, the forty-fifth in a series of biweekly updates, is part of an effort by CNA to provide timely, accurate, and relevant information and analysis of the field of civilian and military artificial intelligence (AI) in Russia and, in particular, how Russia is applying AI to its military capabilities. It relies on Russian-language open-source material.

Approved by September 2022: Michael Kofman, Research Program Director
Russia Studies Program / Strategy, Policy, Plans and Programs Division

This work was performed under Federal Government Contract No. N00014-22-D-7001.

DISTRIBUTION STATEMENT A. Cleared for Public Release.

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DNL-2022-U-033403-Final

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