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Abstract

This report, the nineteenth 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.

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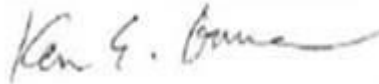
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Cover image credit: "1B75 "Penicillin" - an automated sound-thermal complex (AZTK) of the army" [1Б75 «Пенициллин» - автоматизированный звукотепловой комплекс (АЗТК) армейского звена], Russianarms.Ru, Oct. 26, 2016, http://www.russianarms.ru/forum/index.php?topic=13710.0, accessed Jan. 28, 2021.

Approved by: **January 2021**

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Contents

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Governance and Legal Developments

1. Russian government publishes draft resolutions on AI development subsidies

As discussed in past issues of *AI in Russia*, the Russian government has been organizing its spending priorities on technological innovation. In January 2021, the Russian government published seven draft resolutions approving the provision of subsidies aimed at AI development. The Russian Ministry of Economic Development developed the resolutions, which will amount to more than 16.5 billion rubles from the federal budget from 2021 to 2023.

The government decrees would grant subsidies to the following:

- The nonprofit organization "Fund of the Development Center for the Development and Commercialization of New Technologies," with the goal of supporting pilot projects to test AI technologies in priority industries. For this measure, the budget will provide 736.8 million rubles in 2021, 1.8 billion rubles in 2022, and 1.4 billion rubles in 2023.

- The federal state budget institution "Fund for Assistance to the Development of Small Form Enterprises in the Scientific and Technical Sphere," with the goal of carrying out grant support to small enterprises engaged in the development, implementation, and commercialization of products, services, and solutions in the AI field, as well as developers of open libraries in the AI field. It will also support the acceleration of projects using AI. For this measure, the budget will provide 1.4 billion rubles in 2021, 1.9 billion rubles in 2022, and 1.8 billion rubles in 2023.

- The independent nonprofit organization "Russia – The Country of Opportunities," so that it can hold AI-related hackathons aimed at solving business and social problems, including with the use of government datasets, and for holding lectures on AI. For this measure, the budget will provide 37.4 million rubles in 2021, 246.1 million rubles in 2022, and 209.4 million rubles in 2023.

- To the independent nonprofit organization "National Priorities," to conduct a popularization campaign aimed at increasing the level of confidence in AI. For this measure, the budget will provide 50.6 million rubles in 2021, 106.3 million rubles in 2022, and 74 million rubles in 2023.

- To the nonprofit organization "University of the National Technological Initiative 2035," to formulate AI-related projects for students, to ensure that Russian citizens

receive professional education on AI, to develop a digital accounting solution, and to develop a community in the field of AI. For this measure, the budget will provide 236.8 million rubles in 2021, 346.8 million rubles in 2022, and 315.6 million rubles in 2023.

- To research centers in the field of AI, to develop "strong" AI and systems of trusted AI, and to explore the ethical aspects of the use of AI. For this measure, the budget will provide 1.2 billion rubles in 2021, 2 billion rubles in 2022, and 2 billion rubles in 2023.

- To the "Center of Expertise" subdivision of the nonprofit organization "Analytical Center under the Russian Government," to implement the federal project "Artificial Intelligence." For this measure, the budget will provide 229 million rubles in 2021, 271.4 million rubles in 2022, and 7 million rubles in 2023.

Source: Tatiana Kostyleva, "Draft resolutions have been developed on the allocation of 16.5 billion rubles in subsidies for AI development in Russia" [Разработаны проекты постановлений о выделении 16,5 млрд руб субсидий на развитие ИИ в России], D-Russia, Jan. 15, 2020, https://d-russia.ru/razrabotany-proekty-postanovlenij-o-vydelenii-16-5-mlrd-rub-subsidij-na-razvitie-ii-v-rossii.html.

2. Moscow authorities approve creation of a detailed resident database

On December 30, 2020, the Moscow mayor's office announced its intention to launch a new system for collecting and storing data on city residents, which will include a wealth of information, including their income, place of residence, pets, relatives, and children's school performance. City authorities intend to allocate 185 million rubles for the creation of the system, which the Moscow Department of Information Technologies will utilize and which will become part of the state information system titled "Central maintenance of the applicant's profile."

According to the procurement documents, the program's goal is to "increase the volume of stored citizen information" and the city government intends to create user profiles on the Moscow mayor's website. The website currently provides more than 370 services to users, including the ability to make a doctor's appointment or pay utility bills. After system modernization, user accounts will contain massive amounts of personal data, allowing city residents to receive public services without inputting information on each application.

Experts expressed concerns over the creation of such a database. Andrei Arsentiev, head of analytics and special projects at InfoWatch Group, said that any centralized system can become a potential source of leakage—a sentiment echoed by Sarkis Darbinyan, head of the legal practice at Roskomsvoboda, a Russian NGO supporting protection of internet users' digital rights. Alexander Savelyev, deputy chairman of the Commission for Legal Support of the Digital

Economy at the Moscow branch of the Russian Lawyers Association, likened the system to that found in China.

As discussed in past issues of *AI in Russia*, Moscow city has paved the way in terms of adoption of AI-enabled tools. Please also see past issues for discussions of privacy concerns among Russian citizens.

Source: Elyas Kasmi, "Surveillance of Muscovites reaches a new level. The authorities will start collecting data on their money, dogs, and cats" [Слежка за москвичами выходит на новый уровень], C-News, Jan. 11, 2020, https://www.cnews.ru/news/top/2021-01-11_slezhka_za_moskvichami_vyjdet.

3. Russian jailers to receive 25 billion rubles for digitalization

On December 25, 2020, the Russian government approved a plan to allocate 25 billion rubles for digital modernization of the Federal Penitentiary System from 2021 to 2023. Under the plan, Russia aims to complete digital modernization of 380 Russian prisons and other correctional facilities by the end of the program term.

The funding of the project will be allocated approximately as follows:

- Most of the funds (10.2 billion rubles) will go toward the part of the program called "Digitalization of the process for observing the regime, protecting the rights, freedoms, and legal interests of prisoners," the key part of which is video analytics with facial recognition to monitor the prisoners and prison employees.

- An additional 791 million rubles will go toward the creation of an information platform for citizens to receive information on the Federal Penitentiary System.

- Around 4.5 billion rubles will go toward converting the document system into electronic format, creating prisoner digital profiles, and developing electronic prison management systems.

- The government will spend approximately 3.2 billion rubles on the creation of a unified information system that will unite the 50 IT systems of the Federal Penitentiary System. This is apparently necessary because not all IT systems of the Federal Penitentiary System are working correctly. A 2018 report found that 44 percent of the equipment is faulty and 72 percent of it is unused.

- The creation of an information system for managing the construction of prison facilities will take 117 million rubles, and another 340 million rubles will go toward the digitalization of prison vehicles, including their operation and repair.

- An additional amount of 3.2 billion rubles is allocated for the final transition of the Federal Penitentiary System to domestic software, where currently only 37 percent of department computers utilize local software.

The Russian government believes this plan will ultimately reduce the costs of the Federal Penitentiary System by 62.5 billion rubles and will increase tax deductions from prison labor from zero to 1.3 billion rubles by 2023.

In a letter sent November 20, 2020, from a Ministry of Digital Affairs official to the advisor to the head of the Federal Penitentiary Service, the Ministry of Digital Affairs criticized the financing for the plan and the fact that Rostec (a state-run corporation specializing in the defense and high-tech industries) will be the only supplier for the project, since it was also a co-author on the plan. If Rostec is indeed the only supplier, it is likely that its subsidiary, NtechLab, will be involved in the creation of the video analytics systems—it completed large-scale testing of video recognition systems with the Ministry of Internal Affairs in 2019. In September 2020, NtechLab announced testing of a new technology that uses cameras for detecting aggressive actions.

Source: Vladimir Bakur, "Russian jailers to receiver 25 billion rubles for digitalization" [Российские тюремщики получат 25 миллиардов на цифровизацию], C-News, Jan. 12, 2020, https://www.cnews.ru/news/top/2021-01-12_vlasti_odobrili_plan_tsifrovizatsii.

Military and Security Developments

4. Russian military preps systems and weapons for net-centric warfare

Russia's RIA Novosti state media agency reported that the Russian military conducted a network-centric exercise that utilized Msta self-propelled artillery mounts connected by a single control system. Russian MOD defines network-centric warfare as "the deployment of digital networks with vertical and horizontal integration of all participants in a military operation."

The MOD noted that for the first time, the artillerymen practiced the use of the Mtsa-S-M2 self-propelled guns in a unified fire control system. The Msta howitzers used the ESU TZ unified tactical control system to exchange data and adjust fire in real time. The MOD clarified that the ESU TZ allows for the transmission of information from guidance nodes so that the division command can adjust and apply tactical and fire missions in real time. The howitzers used drones and reconnaissance systems for acquiring targeting data.

These artillery units are not the only ones preparing for Russian net-centric warfare. According to key Russian military experts such as Viktor Murakhovsky, the editor-in-chief of *Arsenal Otechestva* ("Arsenal of the Fatherland") magazine, the new generation of T-14 "Armata" MBT could also take part in network-centric warfare. Earlier, the Russian military tested the network-centric capabilities on the newest T-90M Proryv MBTs. The unified tactical control system (ESU TZ) installed on these vehicles allowed tanks to be linked into a single information network in order to increase their combat effectiveness. Murakhovsky noted that the full capabilities of the ESU TZ and the network-centric principle of combat operations will be applied in the next-generation T-14 Armata tanks, which have a digital command and control mechanism capable of exchanging information within the framework of a single reconnaissance information field in automatic mode. Murakhovsky noted that this capability creates the preconditions for the robotization of future combat vehicles.

Acquiring better situational awareness with the help of unmanned aerial systems is a significant MOD RDT&E pattern that the CNA Russia team has been tracking over the course of the newsletters. The Russian MOD is now acquiring small quadrocopters to equip reconnaissance companies and battalions, and these small UAVs will be used in everyday activities such as monitoring drills and exercises. The MOD started experimenting with small quadrocopters in 2019, when many were sent to the Eastern Military District for trial and evaluation. At the end of 2020, the MOD recognized that these tests had proved successful.

The experiment also revealed that these small UAVs have a shorter flight range and duration, and are more vulnerable to the effects of electronic warfare and ground fire than the drones currently in Russian service. At the same time, the quadrocopters can take off and land anywhere, and are capable of hovering over one place for a long time; they also are affordable and easy to operate. The MOD did not confirm whether these UAVs will be domestic or imported.

The MOD may be borrowing a page from the non-military, non-state actors it has encountered in its current conflicts. During the Russian military's drive to defeat anti-Assad militant groups in Syria and Iraq, it seized dozens of Chinese-made quadrocopters. With the help of these simple UAVs, the militants not only conducted reconnaissance, but also attacked targets by dropping small improvised bombs from the drones to inflict losses on personnel, disable equipment, and even blow up ammunition depots. At this point across the Russian Ground Forces, drones are routinely included in the reconnaissance units of combined-arms brigades and divisions. By the end of 2019, UAV companies and platoons were formed in all divisions and brigades across the Airborne Forces, with artillery units acquiring them this year.

Sources: "Network-centric wars: a new type of combat was tested in the Russian Federation" [Сетецентрические войны. В РФ провели учения по новому типу ведения боя], RadioSputnik.Ria.ru, Jan. 19, 2021, https://radiosputnik.ria.ru/20210119/ucheniya-1593674478.html; "Expert assessed the effectiveness of the T-14 Armata tank in network-centric warfare" [Эксперт оценил эффективность танка Т-14 "Армата" в сетецентрической войне], Ria.ru, Jan. 16, 2021, https://ria.ru/20210116/armata-1593302297.html; Anton Lavrov, Roman Kretsup, "With a drone on a reconnaissance mission: Russian military starts massive quadcopters aqusition" [С дроном в разведку: стартует массовое оснащение армии квадрокоптерами], Iz.ru, Jan. 15, 2021, https://iz.ru/1111609/anton-lavrov-roman-kretcul/s-dronom-v-razvedku-startuet-massovoe-osnashchenie-armii-kvadrokopterami.

5. Russian publication discusses military robotics developments

The publication *Voenno-Promyshlenny Kur'er* ("Military-Industrial Courier" – VPK) recently published an analysis of Russia's UGV acquisition drive. VPK is one of Russia's more authoritative sources on military and defense issues. The January 2021 analysis was based on the interview given by Army General Oleg Salyukov, commander-in-chief of the Ground Forces, on new weapons acquisition, including robotic ground systems. He specifically mentioned three robotic systems (RTKs) slated for the Russian armed forces: Uran-9 state tests are nearing completion, while the heavy Shturm and mid-sized Soratnik UGVs are currently in development. Gen. Salyukov noted that the introduction of UGVs would change the order and methods of using combined arms formations in future wars.

The VPK analysis questioned Gen. Salyukov's assessment of the RTK's capabilities. It noted that using the word "robotic" is incorrect, since Uran-9 is a remotely controlled machine. Following much-publicized 2018 Syrian tests, the Russian military commission concluded that using Uran-9–like machines would be impossible within the next 10 years, even if the flaws identified were addressed. VPK specifically notes that ground RTKs with existing technologies are conceptually untenable.

This assessment was based on the fact that the human operator controlling such a vehicle is not able to obtain the necessary amount of information about the UGV's situational awareness (SA), such as what threats it faces, what support it can provide to its troops, and how it can potentially harm the soldiers if the situation on the battlefield is incorrectly assessed. VPK noted that in the near future, the RTK with artificial intelligence elements should be able to make a significant part of the decisions that are now entrusted to the operator. The analysis did not further elaborate on the AI's role for RTK combat and utilization.

The VPK analysis compared Uran-9 with the Black Knight, its British-American counterpart developed by BAE Systems, noting many similarities between the machines' basic characteristics. The analysis confirmed that modern UGVs can be used in combat, but only in a limited capacity such as low-intensity conflict or reconnaissance missions. However, the Russian analysis noted that such systems would be "annihilated by artillery fire" in battles where a significant amount of armored vehicles are used by both sides, because the UGV's dexterity and maneuverability would be inferior to those of any infantryman. The analysis concluded that with highly maneuverable actions of combined arms formations, tracked drones such as Uran-9 would simply be "trampled underfoot."

Previous *AI in Russia* newsletters have highlighted different UGV developments, such as the Marker RDT&E conducted by the Advanced Research Foundation (Russia's DARPA-like equivalent). The Marker concept seeks to address some of the critique outlined in the VPK article, such as the development of artificial intelligence for vehicle's SA, and swarm tactics with UAVs for better informational awareness in combat (see newsletter #11). Earlier, Russian state media reported that in the near future, Russian military robotic complexes would be able to independently recognize targets, use weapons, and interact in groups and swarms.

Sources: Vladimir Tuchkov, "AI at tank controls" [Искусственный интеллект за рычагами танка], VPK-news.ru, Jan. 11, 2021, https://vpk-news.ru/articles/60333; James England, "BAE Systems Black Knight Tank – Unmanned Combat Vehicle," MilitaryMachine.com, Jan. 1, 2020, https://militarymachine.com/black-knight-tank/; "In the future, Russian military robots will recognize and strike targets on their own" [Российские боевые роботы в будущем смогут сами распознавать и поражать цели], Tass.ru, Feb. 5, 2019, https://tass.ru/armiya-i-opk/6081210; Samuel Bendett, "Russian Ground Battlefield Robots: A Candid Evaluation and Ways Forward," MadSciBlog by USTRADOC, June 25, 2018, https://madsciblog.tradoc.army.mil /63-russian-ground-battlefield-robots-a-candid-evaluation-and-ways-forward/.

6. Russian Navy prepares for automation

In January 2021, the commander-in-chief of the Russian Navy, Admiral Nikolai Evmenov, spoke at the Joint Naval Training Center in St. Petersburg. When discussing current and future shipbuilding plans, he stressed that the emphasis is on training sustainable skills, as well as on the operation of modern equipment and weapons that utilize a high degree of automation.

The Russian Navy has been working towards unmanned autonomous systems RDT&E, and the latest proposal by a domestic design bureau points to the trends that Admiral Evmenov highlighted. The Nevsky Design Bureau (PKB, part of the United Shipbuilding Corporation) has developed two new ship projects: the *Varan* ("Monitor") vessel, and a new landing ship.

The Nevsky bureau envisions *Varan* as an aircraft carrier, with a high degree of automation and the possibility of using robotic systems. It could carry 24 multipurpose aircraft, six helicopters, and up to 20 unmanned aerial vehicles. Operating this equipment—especially the unmanned systems—would require a more sophisticated skillset, something that Admiral Evmenov alludes to in his address. At this time, the Russian Navy does not have any large UAVs that can land on an aircraft carrier deck, but the MOD is starting to experiment with smaller Oran-10 drones that can be launched from decks on surface platforms. Although *Varan* is just a concept, it shows how the Russian military is envisioning future combat, where unmanned/autonomous systems will play an ever-growing role.

Sources: "The Commander-in-Chief of the Russian Navy spoke about the crew training" [Главком ВМФ рассказал о подготовке экипажей новых кораблей], Flot.com, Jan. 14, 2021, https://flot.com/2021/%D0%92%D0%BC%D1%841/; "Nevsky Design Bureau unveils unique 'Varan' ship concept" [Невское ПКБ представило проект универсального морского корабля "Варан"], Tass.ru, Jan. 18, 2021, https://tass.ru/armiya-i-opk/10488643; "Russian military tests naval net for catching drones" [Российские военные испытали корабельную сеть для ловли беспилотников], NPlus1.ru, Apr. 29, 2019, https://nplus1.ru/news/2019/04/29/landing.

7. Okhotnik UCAV carries out ground strikes for the first time

In January 2021, S-70 "Okhotnik" heavy attack drone (UCAV) reportedly carried out its first-ever ground bombing run at the Ashuluk range. According to MOD sources highlighted by RIA Novosti, Okhotnik dropped 500-kilogram unguided aerial bombs from the inner fuselage compartment, hitting the target with precision.

The MOD sources claimed that Okhotnik utilized a new sighting and navigation system that makes it possible to use free-falling ammunition with an accuracy approaching that of a high-precision guided weapon. Okhotnik UCAV is capable of autonomously hitting ground stationary and mobile targets with previously known coordinates, including when it receives external target designation in the air. Last year, the Okhotnik performed a series of flights with functional air-to-air guided missile simulators. This UCAV will conduct aerial combat missiles test launches in the second half of 2021.

According to Russian military commentators such as Viktor Murakhovsky, the editor-in-chief of the magazine *Arsenal Otechestva* ("Arsenal of the Fatherland"), the Okhotnik will become the "loyal wingman" for the Su-57, and will be able to use the entire range of weapons of the fifth-generation fighter, including high-precision missiles. He added that along with unguided free-fall bombs, the S-70 could use bombs with laser and satellite guidance systems—KAB-500L and KAB-500S. At this stage, MOD is also discussing Okhotnik as an AI-enabled UCAV capable of autonomous operation.

Sources: "Okhtotnik drone carried out a bombing run" [Беспилотник "Охотник" нанес в ходе испытаний бомбовый удар], Ria.ru, Jan. 12, 2021, https://ria.ru/20210112/bespilotnik-1592658813.html; "Military expert assessed the capabilities of the newest Okhtonik drone" [Военный эксперт оценил возможности новейшего беспилотника "Охотник"], Ria.ru, Jan. 12, 2021, https://ria.ru/20210112/bespilotnik-1592682275.html.

8. Russia to complete Poseidon UUV naval base by 2022

According to Russian state media, the MOD will complete the construction of a coastal base for the Poseidon nuclear unmanned underwater vehicles (UUVs) in the summer of 2022. This coastal base will provide maintenance and storage for Poseidons. The base's location is not being reported.

This has been one of Russia's most discussed new weapons in the Western media, since its public unveiling in March 2018. The Poseidon was reportedly designed to destroy important coastal infrastructure and inflict "unacceptable" damage, according to MOD statements. According to the Russian analysts' assumptions, the Poseidon's dimensions make it possible to carry a nuclear warhead. This UUV is supposed to have an unlimited cruising range, given its nuclear propulsion, and its sophisticated autopilot can hit a coastal target in any maritime area.

Before the Poseidon submarine carriers were commissioned, the Russian Navy carried out tests on the B-90 "Sarov" experimental submarine. The K-329 Belgorod submarine is scheduled to be the first full-time carrier of the Poseidon UUVs; it was built according to a modified 949A Antey nuclear submarine project, with Poseidons to be located in six silo

launchers. The construction is underway for another submarine, to be armed with strategic nuclear drones. According to media reports, the launch of the Khabarovsk nuclear carrier is scheduled for the fall of 2021.

Sources: Anton Lavrov, Roman Kretsup, "Poseidon's Home: base for nuclear robots to be completed by next summer" [Дом «Посейдона»: базу для ядерных роботов достроят к будущему лету], Iz.ru, Jan. 14, 2021, https://iz.ru/1111083/anton-lavrov-roman-kretcul/dom-poseidona-bazu-dlia-iadernykh-robotov-dostroiat-k-budushchemu-letu; Dmitry Pyatov, "Russia to complete the doomsday weapons base by summer 2022" [Россия достроит к лету 2022 года базу оружия «Судного дня»], Riafan.ru, Jan. 14, 2021, https://riafan.ru/1369060-rossiya-dostroit-k-letu-2022-goda-bazu-oruzhiya-sudnogo-dnya.

Corporate and Market Developments

9. Skolkovo releases map on AI tech for UN sustainable development goals

The Skolkovo Foundation has released a new, online interactive map that identifies Russian AI technology developments that fall within the remit of 17 UN Sustainable Development Goals that were defined in 2015. There are 40 finalists for this stage of the project, providing AI solutions in fields such as healthcare, education, retail, and fintech. Their technologies are entered onto the interactive map, which will allow for international recognition of Russian efforts in these fields. The new "Sk[ai]HUB" platform is said to be "an ecosystem of support measures and initiatives by Skolkovo Foundation to develop a high-tech area of 'Artificial Intelligence' in Russia." The map is billed as a means to better identify Russian contributions to the Sustainable Development Goals as part of the ongoing domestic National Strategy on AI. The program is supported by Tinkoff, Marine Innovations, and the Digital Economy League and is expected to be joined by international companies in 2021.

Source: "Skolkovo Foundation launched an interactive map of technologies for the implementation of the UN sustainable development goals" [Фонд «Сколково» запустил интерактивную карту технологий для реализации целей устойчивого развития ООН], CNews, Jan. 14, 2020, https://www.cnews.ru/news/line/2021-01-14_fond_skolkovo_zapustil.

10. Russian scientists report results of road traffic data analysis

A new academic article reported the results of a study on analyzing road traffic data in real time. The authors, research scientists from Southern Ural State University (SUSU), found significant success using a trained AI neural network ("YOLOv3") on a large dataset of vehicle images. This architecture allowed for high-quality analysis of traffic flow intensity, driving directions, and vehicle speed from static street video surveillance camera data, and further suggested the utility of using AI solutions on analyzing real-time traffic patterns.

The system was tested in Chelyabinsk at six intersections, finding error rates of less than 10 percent on vehicle counting and speed errors of less than 2 m/s. The new system is a helpful development in AI-based analysis of traffic patterns because it more accurately models both

speed and distance traveled metrics. The software package has now been patented and is likely to be of use as Russian cities continue to develop and improve on the "Smart City" macro-system.

Source: Kirill Khazukov, Vladimir Shepelev, Tatiana Karpeta, Salavat Shabiev, Ivan Slobodin, Irakli Charbadze, & Irina Alferova, "Real-Time Monitoring of Traffic Parameters," *Journal of Big Data* 7, 84 (2020), https://journalofbigdata.springeropen.com/articles/10.1186/s40537-020-00358-x; Maria Nediuk, "Work Traffic: A System of Car Flow Control was Tested in the Urals" ["Рабочий трафик: на Урале испытали систему управления потоком машин"], *Izvestiya,* Jan. 9, 2020, https://iz.ru/1100656/mariia-nediuk/rabochii-trafik-na-urale-ispytali-sistemu-upravleniia-potokom-mashin.

11. Labor official discusses impacts of robotics

The director for professional qualification development at the All-Russian Research Institute of Labor, Irina Voloshina, was recently interviewed by RIA Novosti about labor force replacement by automation and robotization. Voloshina noted that while automation could replace some professions as a whole, this will take a decade or longer. Furthermore, she stated that the biggest impact of robotization will be in banking, tourism, and insurance, as well as some office management positions. These areas, however, have already been experiencing the effects of automation for many years, and so further change will not be a shock. She also noted that while some professions might be replaced, new career trajectories will be opened by increasing technological advancement.

Source: "An expert predicted the time-period for replacing workers with robots" [Эксперт спрогнозировала срок замены работников роботами], SearchNews, Jan. 5, 2020, https://searchnews.info/russia/918794-jekspert-sprognozirovala-srok-zameny-rabotnikov-robotami.html.

Education and Training Developments

12. Sberbank CEO stresses importance of AI in Russian education

According to a *Forbes* article, Sberbank CEO German Gref, who was on a panel titled "The Future of Education in Russia" during the Gaidar Forum, commented on the importance of artificial intelligence in the education system. Gref identified five necessary components of modern education: (1) personalization based on the study of the digital footprint of each child and the creation of individual personal trajectories; (2) hard skills training; (3) soft skills training, including social skills, cognitive skills, and emotional skills; (4) digital skills training (i.e., creating products, teaching digital architecture, working with modern cloud product systems, explaining AI and programming), and (5) training of one's ability to learn.

Gref argued that the first of these components, personalization in education, can only be achieved with the help of artificial intelligence. He said, "All this can be done on the basis of a digital system that accompanies a child from primary school to the moment when he goes to the production environment." Gref is a long-time, vocal critic of Russia's education system.

Source: Yulia Titova, "Gref offered to teach schoolchildren decision theory" [Греф предложил учить школьников теории принятия решений], *Forbes,* Jan. 14, 2021, https://www.forbes.ru/finansy-i-investicii/418549-gref-predlozhil-uchit-shkolnikov-teorii-prinyatiya-resheniy.

13. Educational program offers ML course and online game

According to a January 12 TASS article, experts in Russia's Far East have developed a 72-hour-long intensive training course on machine learning. The course is free and open to anyone until March 1, 2021. The course, which provides instruction on computer vision, natural language processing, and predictive analytics, was developed by specialists from the School of Digital Economy of the Far Eastern Federal University within the framework of the project "Artificial Intelligence: a quick start from scratch."

In late December 2020, the makers of this course also developed an online educational game, with prizes including access to courses on AI, internships at major IT companies, and other bonuses. "AI: a quick start from scratch," a new educational initiative which began in

September 2020, was mentioned in issue 16 of *AI in Russia*. The project is executed by the ANO Russian School of Programming, ANO Social Mediator, and PJSC MegaFon, with financial support from the Presidential Grants Fund.

Sources: "An educational course on machine learning was created in Primorye" [В Приморье создали образовательный курс по машинному обучению], National Projects of Russia, Jan. 12, 2021, https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/news/v-primore-sozdali-obrazovatelnyy-kurs-po-mashinnomu-obucheniyu; "Starting from scratch: there is a new game in the field of artificial intelligence" [Старт с нуля: появилась новая игра в области искусственного интеллекта], Regnum, Dec. 28, 2020, https://regnum.ru/news/3153048.html.

14. Yakutia creates digital assistant for public administration

According to a TAdviser article, the government of Russia's Yakutia region has implemented an AI-based digital assistant to collect feedback and requests from the republic's citizens. Using a series of algorithms, the digital assistant collects feedback from social media platforms and other websites, organizing them in a way to help the government be "timely, complete, and reliable" in its responses. On January 15, the head of the Republic of Yakutia, Aisen Nikolaev, reportedly offered to share these technological developments with other Russian regions that might be interested. The proposal to share the AI solution was supported by the deputy minister of digital development of the Russian Federation, Oleg Kachanov.

Source: "Yakutia is ready to share AI-based developments with other regions to work with citizens' appeals" [Якутия готова поделиться с другими регионами разработками на основе ИИ для работы с обращениями граждан], TAdvisor, accessed Jan. 24, 2021, https://www.tadviser.ru/a/558380.

International Collaboration

15. International cooperation on use of AI in UAV development

In cooperation with the German company Rohde & Schwarz, Kaspersky Laboratory has developed an anti-drone technology that uses neural nets to identify and classify nearby drones. It identifies approaching drones and can target them with jamming technology that forces them to land or return to their point of origin. The system is being piloted in Russia, which will start to sell this system in Europe and former Soviet states in late 2021. The system is designed to be used at sporting events and in airports, as well as wherever drones are prohibited. The primary target clientele is private business, rather than governments.

UVL Robotics, one of Russia's leading builders of commercial UAVs, is working with European partners to build automated drone-based airborne delivery systems. These systems are currently being built for export to Persian Gulf states, with a pilot project underway in Oman. The plan is to have 20 units in place in Muscat sometime in 2021, with 1,000 units in place by the end of the three-year project period. The project will include all necessary infrastructure components, including flight safety systems, landing locations, fuel depots, and transfer stations.

The main difficulty is in automatizing flight administration so as to ensure fast delivery. In Oman, the system will use AirMap, a global UAV flight mapping system that is already certified in the region. Collisions are prevented through a combination of active and passive defense systems. Remote operation by human operators is also possible, through 5G networks.

Sources: "Kaspersky will begin supplying anti-drone systems to Europe and CIS in 2021" [Kaspersky начнет поставки системы "Антидрон" в Европу и СНГ в 2021 году], 1prime.ru, Jan. 3, 2020, https://1prime.ru/telecommunications_and_technologies/20210103/832738398.html; Dmitry Leont'ev, "Infrastructure for unmanned aerial vehicles in Russia," TAdviser, Jan. 11, 2020, https://www.tadviser.ru/.

Article: Nature of Military Conflicts Today and in the Foreseeable Future

In an article in the January 2021 edition of *Voennaya Mysl* ("Military Thought"), Col-General Vladimir Zarudnitsky offered an analysis of today's military conflicts and a medium-term forecast for combat transformation. General Zarudnitsky is the head of the Military Academy of the General Staff of the Russian Armed Forces ("the Academy"), the MOD's most influential academic institution. *Voennaya Mysl*, published by the Russian General Staff, is one of the oldest Russian-language military periodicals, dating back to the 1930s. For decades, Soviet, and later Russian, military officers, scientists, and contributors have used the journal to explore the conduct of war and its relationship to technology RDT&E. Specifically, Gen. Zarudnitsky spoke for the entire Academy in his article, pointing out the scope and nature of the MOD's deliberations on the use of AI and military robotics.

Gen. Zarudnitsky noted that an analysis of modern military conflicts has revealed specific trends that the Academy is tracking, such as the development and use of information control systems, unmanned aerial and autonomous sea vehicles, robotic military complexes, and artificial intelligence in decision support systems. In his analysis, Zarudnitsky confirmed that the Russian Federation is part of the mainstream with respect to these weapons and systems RDT&E, and has even taken a leading position on some of them, along with developing effective countermeasures for the analogous adversary systems.

The Russian military official offered his—and the Academy's—view that in modern conflicts, the use of conventional weapons with the reconnaissance, electronic warfare, information confrontation, and automated control is blurring boundaries between strategic, operational, and tactical combat levels. The emergence of new spheres of confrontation predetermines the need to integrate different military approaches and weapons into a single system, and Gen. Zarudnitsky noted the effectiveness of this approach during Russian military operations in Syria. He specifically argued that the development and introduction of the following weapons and systems will have the greatest mid-term effect on the Russian armed forces:

- Accelerated creation of the latest unmanned aerial vehicles (UAVs) with the expansion of their range of functions, along with the development of high-precision aircraft weapons; improvement of automated control systems for delivery vehicles and weapons; and an increase in the range of detection and destruction of targets (without entering the enemy's air defense zone).

- Robotization of all spheres of armed struggle, development of artificial intelligence for robotic systems, expansion of the range of tasks performed by such systems, and

giving these robotic elements the ability to act autonomously. Gen. Zarudnitsky also notes the transition from the principle of human "robot control" to "setting tasks for the robot" for greater autonomy, and the introduction of technologies for group use of military-purpose robotic systems.

- Improvement of high-precision, guided, and homing weapons for UAVs, and an increase in the level of automation of weapons and military equipment, ensuring the transition from the adversary destruction to complex impact on the enemy.

- Creation of underwater robotic systems for military purposes, including strategic ones.

- The introduction of artificial intelligence that is capable of self-learning and analysis of large amounts of data for applications in intelligence and weapons management to strategic forecasting and decision-making.

Zarudnitsky specifically highlighted that the rapid development of artificial intelligence technologies is leading to new ways of thinking on the employment of Russian military forces. He further noted that the blurring of boundaries between peace and war—i.e., the use of hybrid combinations of non-military and military methods to achieve strategic results—requires further improvement of asymmetric methods of responding to challenges and threats to Russia's national interests. Therefore, changes in the nature of the conduct of hostilities will be based on preempting the enemy by improving the forms and methods aimed at conquering and maintaining dominance over the adversary in all spheres of confrontation—by using high-tech weapons, as well as actively conducting information and ideological confrontation.

The Russian military official argued that the Russian armed forces must be prepared for the next-generation hostilities, which will be different in scale and duration, and will have different adversaries—both those possessing high-tech weapons and those with low-tech capabilities. Zarudnitsky concluded his analysis by quoting General Valery Gerasimov's address to the country's military and its RDT&E community that asked them to look "beyond the horizon" to determine in advance the nature of future wars. At this point, Gen. Zarudnitsky's thoughts on the importance of AI and military robotics complemented the general MOD thought on the subject, highlighted in issue #10 of *AI in Russia*.

Source: Col-Gen. V.B. Zarudnitsky, "The nature and content of military conflicts today and in the foreseeable future" [Характер и содержание военных конфликтов в современных условиях и обозримой перспективе], *Voennaya Mysl*, Jan. 2021.

Spotlight: Penicillin Counter Battery Radar

Source: Military Review, "Complex of sound-thermal artillery reconnaissance 1B75 "Penicillin"," Oct. 28, 2018, https://topwar.ru/148924-kompleks-zvukoteplovoj-artillerijskoj-razvedki-1b75-penicillin.html.

In December 2020, the Russian military began deliveries of its newest counter-battery system, "Penicillin," to the armed forces. The system features new detection systems and some degree of automation. It detects both sound and optical emissions through special optoelectronic modules and ground sensors. The system consists of six television cameras and six thermal imagers with a 70-degree field of view and 10-degree azimuth. The signals from these sensors are combined with four ground acoustic and seismic sensors. Penicillin's systems combine these various emissions to pinpoint the source of the strike. Limited open source reporting states that the system can detect firing and impacts out to 25 kilometers.

The Vega concern press reports on the Penicillin note that it should be able to alleviate much of the risk to forward scouts that normally provide targeting information on adversary strike systems and that it can operate in a fully automated mode without an operator.

The Russian military will field these systems at the regiment and brigade level at first, and then provide them to coastal troops.

Source: Bastion Karpenko, "Complex Artillery Reconnaissance 1B75 "Penicillin," http://bastion-karpenko.ru/penicillin/; Ria Novosti, "The expert assessed the prospects of the newest intelligence complex "Penicillin," Jan. 22, 2021, https://ria.ru/20210122/kompleks-1594109718.html; "The Penicillin newest artillery reconnaissance complexes is acquired by the Russian forces" [Новейшие комплексы артиллерийской разведки "Пенициллин" впервые поступили в войска], Tass.ru, Jan. 22, 2021, https://tass.ru/armiya-i-opk/10521623.

In Brief: List of Presidential Instructions Following AI Journey 2020

Issues 16, 17, and 18 of AI in Russia *covered the AI Journey conference, which was organized by Sber and took place on December 4, 2020. The conference resulted in numerous instructions from Russia's president, V.V. Putin, which were provided on the website of the Kremlin. A lightly edited machine translation is provided below.*

The President approved the list of instructions following the conference "Journey to the World of Artificial Intelligence," held on December 4, 2020.

1. To the Government of the Russian Federation:

a) ensure the adoption of federal laws providing for the possibility of establishing experimental legal regimes in certain sectors of the economy and the social sphere in order to expand the use of artificial intelligence technologies;

b) take measures (including tax ones) aimed at stimulating the investment activities of organizations related to the introduction of domestic software and hardware/software systems created on the basis of artificial intelligence technologies.

Deadline - May 1, 2021;

c) in order to accelerate the creation of domestic software and hardware and software systems based on artificial intelligence technologies, ensure the introduction of amendments to the legislation of the Russian Federation, providing for the provision (subject to the protection of personal data) to organizations that develop technological solutions based on artificial intelligence, access to datasets contained, among other things, in state information systems, as well as the possibility of using such data by these organizations.

Deadline - July 1, 2021;

d) develop and approve strategies for digital transformation of at least ten sectors of the economy, social sphere, and public administration in order to achieve their "digital maturity," providing for the introduction of competitive domestic software and hardware and software systems, created, inter alia, on the basis of artificial intelligence technologies, and also to ensure the implementation of these strategies and the introduction of corresponding changes in the existing sectoral strategic planning documents.

Deadline - July 1, 2021;

e) with the participation of interested educational organizations, ensure:

- updating educational programs of higher education in specialties and areas of training related to the development and development of artificial intelligence technologies, by bringing the content of such programs in line with the requirements of the labor market;

- supplementing educational programs of higher education in all specialties and areas of training with sections on the study of artificial intelligence technologies in order to teach the use of such technologies in various fields of activity;

f) with the participation of interested educational organizations and international mathematical centers of the world level, to ensure the improvement of teaching of educational subjects "Mathematics" and "Informatics" in general educational organizations, setting their priority in the curriculum and adjusting the content of the approximate basic educational programs of general education;

g) ensure, starting from the 2021/22 academic year, an increase of at least one thousand control figures in enrollment for training at the expense of federal budget allocations in specialties and areas of training related to the development and development of artificial intelligence technologies in educational institutions of higher education, in of which the share of winners and awardees of the final stage of the All-Russian Olympiad for schoolchildren, members of the national teams of the Russian Federation who participated in international Olympiads in general subjects, accepted for training in the 2020/21 academic year was at least half.

Deadline - September 1, 2021;

h) ensure the introduction of amendments to the legislation of the Russian Federation providing for:

- development of the use of telemedicine technologies;
- expanding the list of certificates that can be issued by medical organizations and bureaus of medical and social expertise in electronic form.

Deadline - July 1, 2021.

Responsible: M.V. Mishustin

2. The top officials (heads of the highest executive bodies of state power) of the constituent entities of the Russian Federation shall develop and approve regional strategies for the digital transformation of key sectors of the economy, social sphere, and public administration in order to achieve their "digital maturity," providing for the introduction of competitive domestic

software and software hardware systems, including those created on the basis of artificial intelligence technologies, as well as to ensure the implementation of these strategies and the introduction of corresponding changes in the existing sectoral documents of strategic planning of the constituent entities of the Russian Federation.

Deadline - September 1, 2021

Responsible: senior officials (heads of the highest executive bodies of state power) of the constituent entities of the Russian Federation.

Source: "List of instructions on the outcomes of the AI conference" [Перечень поручений по итогам конференции по искусственному интеллекту], Dec. 31, 2020, Kremlin website, http://www.kremlin.ru/acts/assignments/orders/64859.

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