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Artificial intelligence is an assistant, not a competitor

Russia was the first in the world to register a vaccine against COVID-19. It is a fact. Despite the hype and criticism from all sides, the country systematically vaccinates the population, no obvious side effects have been established. An increasing number of countries are wondering whether to buy a Russian drug: there are either not enough others, or their use is dangerous. Olga Uskova, the person of the April issue, the founder and president of Cognitive Technologies, the general director of Sber's subsidiary Cognitive Pilot, in one of her interviews called this achievement of Russian scientists a breakthrough and real heroism, and also focused on the fact that without the participation of artificial intelligence when creating a vaccine against the coronavirus has definitely not been done. Her company is creating AI-based unmanned ground transportation systems that are already being implemented and used in real sectors of the economy and are having an effect. Today we will talk about the breakthroughs and achievements of the Russian school of artificial intelligence.

Artificial intelligence, unmanned technologies, taxi without a driver are the hype topics that are on everyone's lips. One thing is that in the race for world leadership in this area, Russian ecosystems prove that it is there that the future, commercial success, new niches and, as a result, the whole life of a person are. Of course, we understand that artificial intelligence already lives with us in the same apartment, shares one information space with us and wins an ever-increasing field of activity from a person. Or is it not so? Who controls whom and for what purposes? Serious developers, whose hands are writing programs for artificial intelligence, do not ask amateurish questions. For them, artificial intelligence is a product of a new technological revolution that will change the world forever. We, journalists, just want to "splash yellowness" on this topic, but it seems that this is the very case when we have the right to ask the most naive questions - revolutions are not just taking place in the minds soon and not. However, our today's interlocutor has no doubts that artificial intelligence is a human assistant in the race for survival, and not a competitor.

- In recent years, you have managed to make a breakthrough in the development and implementation of unmanned technologies in agriculture. Why did the technological and intellectual breakthrough take place in this particular area of the economy?

- Agriculture at the moment is one of the pivotal sectors of the world economy. Over the past twenty years, the number of people living on Earth has increased dramatically. The growth, according to the International Fund "Earth Population", amounted to more than 1.5 billion people, which hit all basic life support systems, primarily food. Nobody expected and was not ready for such an explosive dynamics. The old systems, which had been formed and debugged for many hundreds of years, began to malfunction with a dramatically increased load - it became much more difficult to produce enough food to feed everyone, clean up so much garbage for mankind, and much more. According to the UN, the number of hungry people on Earth just in the previous year increased by 10 million people.

It is absolutely unnatural that people are dying of hunger in the 21st century. A few years ago I was

with one of the UN missions in Africa and saw with my own eyes what it is - hungry people.

In the pandemic, the food problem has worsened even more. Due to the self-isolation of certain territories and regions, well-established trade and logistics chains ceased to function, and transport flows stopped. Areas where people are starving have expanded.

For developed countries, this topic is also relevant, only it is formulated differently: providing the population with food is a matter of strategic security. In addition, developed countries are also concerned about the quality of their products. In European countries, with their small size, by our standards, farmers have been exploiting the same land for hundreds of years. The earth is exhausted and worn out, including by chemistry, which has been especially actively used in recent times. Therefore, the question of the development of new territories, including in remote areas, is now especially acute. In particular, in Russia we are talking about more actively using land in the Urals and Siberia in crop rotation, including those that were previously considered practically unsuitable for farming.

The agricultural industry has long been in search of a solution in this zone, and, according to experts, it is impossible to find a way out without the use of robotic technologies. Robots can work in the most difficult conditions. Unmanned technologies are capable of giving the industry effective tools for doing business - this is a completely different enterprise economy, employment, a decrease in the cost of a product, a reduction in losses in production, a new level of control over it.

Employment in this context is rather a matter of the redistribution of human resources. For all the time of the existence of mankind, people more cunning and richer have been looking for someone who will plow for them. Now, thanks to artificial intelligence, it has become possible not to divide society into classes, do not do

being slaves from someone, and finding smart helpers for yourself, freeing a person from heavy physical routine labor is a much more humane and effective solution. A slave or a prisoner does not work well, he has no motivation. And the agrobot is extremely efficient in terms of its functionality, since it contains such a program.

Therefore, today we are witnessing a paradigm shift in agriculture, thanks to artificial intelligence in the industry, a new era has begun when there is a change in the means of production with which a product is created. Man is excluded as a link from this chain. The technology controlled by him is giving way to robots. This is the most that neither is a revolution - this is how Karl Marx described it.

- Is there a demand for a deeper digitalization of agriculture, where it is concentrated: in large agricultural holdings, or on smaller farms?

- In large structures, management teams are often far from the ground, scattered and scattered literally in different parts of the country. Decisions on the introduction of technologies, the transition to new products are taken and agreed upon for a long time. They react much faster to innovations in medium-sized and even closer to small farms, where the owner himself is in the fields, knows the whole process from and to and makes decisions quickly. He counts every ruble, wants to wrap it up as quickly as possible and it is easier for him to do it technically. The process of managing it is better controlled, and for him economic growth with the help of robotic technologies is what he needs. The robot is not an intermediary. He will not come up with "left" schemes, he works according to the given algorithms. In addition, on a small scale, the introduction of new tools and technologies is easier and faster to implement. Therefore, today it is medium and small farms that are the main zone of progress, the demand for "smart" solutions, they are the source of the order for innovations.

In addition, from our intelligent systems and technological solutions of our partners, farm owners

online (24 by 7) receive reporting, monitoring, analytical information about how much is harvested at any given time, whether there are losses, where is the equipment, how this or that block works - this is a huge knowledge base about business processes, which gives them a feeling of complete controllability. We have already formed a pool of partners from small and medium-sized agriculture. I think that in the near future we will move on to creating an integrated digital platform for the countryside, as there is a demand for it.

- Why are Russian technologies so cool?

- Our Russian school has made great strides in research and development of technologies based on artificial intelligence. Our country has a very high patent potential in this direction. Today, Russia is definitely in the top three of the world leaders, and this is determined in part by the conditions in which the Russian school of artificial intelligence was created. For example, in order to develop and sell our unmanned systems for agriculture on the world market, we had to focus on real, very difficult climatic and weather conditions in which Russian farmers grow their crops. The whole world

tries to "tune in" to the sun and warmth, and we were initially focused on any weather. So, last October, in a number of regions, our robots worked with a full dust curtain; in November, in Orenburg, they harvested fodder corn in a frost of minus 15, in the snow. And, oddly enough, when we began to work in this direction, it turned out that farmers all over the world are constantly faced with bad weather: fogs, dust storms, cold weather. This is how we hit the trend.

The situation is similar with projects for the railway. Our artificial intelligence ensures safety in any weather, it is tested, accustomed to work even in the harshest conditions. Therefore, we are able to detect such complex small objects as arrows on the tracks, which are already poorly visible, especially at large distances, it does not matter - in winter or at night, in rain or when the sky is clear. It's the same with dwarf traffic lights and other infrastructure. Any mistake in recognition provokes the risk of an accident.

- What conditions are necessary to create effective unique teams of researchers and engineers capable of creating breakthrough technologies?

- In our case, it was a natural process. Such groups do not gather by force. A unique team is formed when it is interesting. When there are central personalities, not only brain, but also emotional centers of attraction, such as Kurchatov and Korolev were.

I have already noticed more than once that the main question that overtakes every person in life is - what for am I living? This is the key, nuclear issue of our psyche. And when there are people who know why, for whom self-realization is in the first place, this is a much stronger incentive than popularity, money or anything else. Then powerful teams gather around them to create breakthrough technologies.

Recently, on Katerina Gordeeva's channel, I watched an interview with Lyudmila Petrushevskaya. In it she races

she showed a lot of interesting and personal, including about her sores, she's not young anymore. I saw in her an incredible inner freedom, which she retained regardless of the most extreme situations. Despite her age and all the difficulties, this woman is dancing step in front of the cameras.

The same emotional background, the same charged people work in our office. And these are all young guys, mostly graduates of the leading technical universities in Moscow, a kind of refined metropolitan youth. And here it is really difficult: hard work with agricultural robots in Siberian fields surrounded by clouds of midges, in pouring rains or on smart locomotives in northern latitudes at night, a blizzard,

frosts down to minus 40. I thought the guys would not stand it, start whining or run away, but in the end I did not hear a single complaint. I am sure that the most enviable suitors work in Cognitive Pilot - you can fall in love with everyone.

I am telling this so that there are no illusions that artificial intelligence and high technologies are created exclusively in offices or on the beach in front of the monitor. These are breakthrough technologies, new markets - a lot of unexpected things are happening here, we are all pioneers who are taking a new path. And we should never forget that we have infinite responsibility for the created product. The guys are essentially gods, they turn an object into a thinking subject. This is well felt, for example, when you are inside the combine, and he himself understands, without your participation, where and how to move. This is a very strange feeling. It is difficult to get used to this feeling quickly: on the one hand, you understand that it is a "piece of iron", but on the other, it has brains that work superbly.

- What is a marker of the company's effectiveness for you: its value, the number of commercially successful products, breakthrough technologies patented in Russia ... Perhaps something else, personal? How are your international projects developing?

- We have embarked on the path of moving towards an IPO. We want to be worth five billion dollars. At the first stage, we found a financial partner in the person of Sberbank. It was a year ago. During this time, we created service centers, opened a factory for the production of filling for drones in Tomsk, launched 350 combines equipped with our AI into the fields, and prepared a smart locomotive project for scaling.

When so many events significant for the company happen in a year, it begins to seem to me that we do not live in linear space, but in the space of events, that is, we do not exist in a time stream, but from event to event, from goal to goal - time does not stretch as before, it flies by unnoticed. If you pack it into events, you live at insane speeds.

I think in terms of events, and I measure progress for the company in many ways by the number of products that hit the sales shelf, that is, when the technology is completely packaged and is a finished product. We already have the Cognitive Agro Pilot artificial intelligence system for autonomous control of agricultural machinery on our shelf. Now we are also preparing to supply there "smart" Cognitive Rail Pilot complexes for shunting locomotives, and we are finishing the certification of the product. Russian Railways was the customer of the technology and made a pilot purchase. Together with them, we went a difficult path, since the use of unmanned technologies is associated with special responsibility, now we are at the final stage. I will tell you honestly that the certification of a product that will be used in transportation is always a very long and difficult story. The locomotives drove more than 300 hours on real roads in the test run mode, when our guys were sitting in the cockpit, the road workers drove more than 5 thousand hours without our participation in the framework of controlled operation.

At the same time, we are going through the same path in China - each country has its own nuances, mental characteristics. From country to country, the requirements of the authorities for the technologies being introduced differ significantly. In addition, in Russia we developed a technology for cargo transportation, and in China we immediately entered the passenger transport market, where we are working on an unmanned tram control system for Shanghai, preparing to launch mass production. The series will be very large, which will force us to increase production capacity, we will no longer open new lines in Russia. The Chinese authorities are encouraging us with tax breaks to start production on their territory. For us, this is a new field of business - the creation of production abroad. We have systematically increased our international presence and started to create a sales group. We still lack experience in building a global business. In the same agriculture, each region has its own

characteristics, its own way. For example, large agricultural producers prevail in Russia, and, for example, in Argentina, most of the farmers are represented, outsourcing is developed there at all stages of business. For me, creating an international company is a challenge, a challenge that requires resources and time.

- What markets do you consider the most promising for the sale of Russian unmanned control systems ?

- Russia creates a high demand for unmanned technologies, there is a rapidly growing market here - both in agriculture and in railway transport. As for the international segment, this is China. We have come a long way with our Chinese partners - the first payment went to us through the "central committee of the party", we were checked countless times, we were frightened by the lack of real prospects, they said that business would not be crowned with commercial success.

But we got our own experience and concluded that it is important to work out the legal aspect of interaction as carefully as possible. Now that this work is behind us, China immediately gives us colossal volumes, this is a mega market. Even in our case, when it comes to a trial purchase, it is not one or two, but several hundred devices at once, and these are significant numbers, "smart" technologies are quite expensive for our task.

In addition, this is, of course, Latin America - Brazil and Argentina. These are countries with year-round farming, there is always good weather, but there are risks: for example, insane inflation, which amounts to tens of percent per year. In general, there are no ideal places. In any country in the world there are problems, only by immersing yourself in the essence, you begin to notice them and correctly evaluate them.

- You once said that for Russia the production of microprocessors is a "lost zone". What niches can Russian manufacturers still occupy in order to become world leaders?

- We are actively studying and working on the issue of the production of 4D radars, or imaging radar (a generally accepted term in the world). We have been developing in this direction for several years, today we feel ourselves as leaders in this direction and not only in Russia. Back in 2018, we presented the world's first industrial prototype of 4D Cognitive Imaging Radar in Detroit at the Tech.AD specialized exhibition, and received a high expert assessment from the professional international community. Unlike classic 2D radars, which scan space in a plane and determine only the speeds and coordinates of objects, we have learned to evaluate their shape. Unlike other sensor cameras and lidars, radars are capable of doing this in any weather.

The production of our own radars of the latest generation for unmanned vehicles is a grandiose niche for Russia, we will expand it and invest in these technologies.

Of course, we are also developing new directions, because we live in several planes at once: the first is today, the second is the future with a two-year horizon, and the third is a ten-year perspective. We are building a R&D strategy with this long-range scope. We see how the world is changing, where it is going. If we hit the target with our predictions, we will get a breakthrough, if not, it will be lost money - this also happens. We believe that we are "holding God by the beard" in the sense of building neural mechanisms to control complex systems. A person receives information through sensors: vision, hearing, tactile sensations. One of the most important issues of adequate interaction between a human and a robot is the imitation of sensory sensations. Now we are focused on the creation of artificial vision, the next step is to work with tactility, the creation of a system for the perception of tactile sensations in artificial intelligence. In essence, we are creating an "eye-brain" system.

- As manufacturers of smart systems, you are experiencing difficulties with production, with components, is there a task of import substitution?

- Any manufacturer, especially in times of crisis, such as a pandemic, is faced with the problem of supplying components. In addition, their prices are volatile and the filling we work with is highly dependent on metal prices. In these conditions, it is extremely important for us to keep the economy, since we have serial production, the price of the final product cannot change significantly in the short term. Today the ratio of Russian and imported components in our production is 50/50. In order not to experience a shortage of components, we order them from various foreign manufacturers. Our import purchases, like many leading drone developers, are based on NVidia tensor processors. To get rid of this dependence, we are analyzing the capabilities of one of the Russian microchip manufacturers, IVA Technologies. The first test stage of interaction with them has been passed, if they can make a breakthrough and move on to mass production, we will have a free hand - we will replace a significant share of imports.

For us as a manufacturer and for the Russian microelectronics market as a whole, this will be an important leap forward. We will get an analogue on the domestic market at a lower price - without the risk of not importing it across the borders, regardless of price jumps in currencies. This will be a different economic model for all microchip consumers in Russia.

- In one of your interviews, you talked about Russia's success in developing a vaccine against COVID-19. You also noted that the vaccine came so quickly thanks to artificial intelligence. What was its function?

- Artificial intelligence solved the problem of analysis enormously

With the array of incoming data, it would take a person months or even years. The vaccine is heroism and a breakthrough. Russia has made the world's first drug capable of defeating a dangerous virus. It would be even better if we were able to quickly establish a multimillion-dollar production (in terms of the number of doses). We would have a head start in front of the whole world at least six months. But while the economy of mass production in Russia is being debugged for a long time and is difficult. We are a very smart country, we need to learn how to quickly establish mass production.

- Do you feel in any areas rejection or opposition to the introduction of autonomous transport systems on the part of people?

- Humanity is not going anywhere. We are dealing with a qualitative change in the means of production, as in the folk song it is sung "then capitalism came to an end." The existing conservative systems: legislation, insurance, etc., are not geared towards these changes. As always happens at the time of global revolutions, including technological ones, part of the population is ready to intensify. The incomprehensible part, who does not realize that it is better to lead this process than to lie down on the rails, opposes them. I think this transition period will last for about five years.

From all the hype that is happening in Russia today around the topic of unmanned technologies, their launch into commercial operation, I made one important conclusion for myself: this topic is really important for people, which means that a scrapping has occurred in the mass consciousness. When we first started out, I thought that we were working in a narrow niche, as they say, "poking around in our sandbox," and what we do there is of little interest to anyone at all. No, this is far from the case. Now I understand that people in Russia are absolutely ready for the maximum transition to an even deeper integration of artificial intelligence into the mass space. I am very pleased with that.

- How deeply is artificial intelligence integrated into our everyday life?

- Almost all of us used vehicles that are controlled automatically, including with the help of artificial intelligence, just not everyone knows or thinks about it. We all have already crossed this line. When we fly an airplane, it is driven by an autopilot. In financial systems, solutions for information monitoring, intertext (games, bots, Alice columns), we encounter AI all the time.

Its penetration into our everyday life happened a long time ago, it is quite deep. And this has already led to a shift in certain accents of perception in the human psyche. When railways were laid in Russia, steam locomotives were launched on them, people got used to them for a very long time. Now a person accepts global changes much faster. The speed of life, information flows and changes has grown many times over - we need helpers to cope with all this. For example, children are dealing with such a layer and volume of knowledge and information that they cannot filter it out and digest it, they need help, adults too. This function of primary analysis is partially performed by the same artificial intelligence.

- Is artificial intelligence able to reveal all the secrets of a person?

- No, it is impossible. The biological, natural system of human control is very complex, and the number of neural connections is infinite. And it is foolish to give artificial intelligence a universal task to unravel all the secrets of the human brain and body. Another task should be set: a person needs to survive in the face of existing challenges and global problems, now his future on Earth is in question. This is the minimum program for artificial intelligence. The maximum program is the evolutionary development of mankind with the help of invented technologies. Artificial intelligence is an assistant, with its help people can "pump" themselves and achieve new results.

- Are there any ethical or psychological problems in the field of AI and its development for you?

- Yes, of course, I have a rather tough position on this issue. Artificial intelligence is developing rapidly, human moral guidelines, on the contrary, are degrading, but the task for AI is set by a person. If it is blurred, vaguely formulated, the system has a backlash, within which dangerous branches can arise, because AI is a self-learning system. And, if you leave the system with the opportunity to choose, things may not go on the most correct path. Therefore, at Cognitive Pilot, we adhere to the position that AI should have a narrowly functional application. Should be superimposed

strict restrictions on the creation of universal artificial intelligence - it should not and cannot participate in thinking about the "fate of the world", and not because it is impossible (unfortunately, it is just possible), but because a person cannot formulate for artificial intelligence clear terms of reference for solving such a global problem. People among themselves cannot agree on moral foundations, they constantly deceive each other. All are equal, but this one is more equal - it is impossible to set such boundaries for the system if such tasks are laid in it.

y, the AI itself will apply this method to itself and immediately remove all restrictions from itself. Therefore, it is necessary to set highly specialized tasks before it; AI cannot be used where there is no specification.

Until there are strict rules and regulations, controversial and acute situations will arise. There have already been precedents: a few years ago, a European car manufacturer announced that when the autopilot was faced with a choice of whether to save a passenger or a pedestrian, it would choose the former. The answer to the question "why" was simple: otherwise no one would buy cars from us.

This approach becomes possible because the position of the state has not been formulated. And, if people do not want to face such a choice, they should now formulate an ethical code for artificial intelligence, impose restrictions on its use. After all, it can be used for any, the most terrible purposes, for example, terrorist. It is high time to form a legislative basis for the use of artificial

intelligence. These are urgent issues that need to be addressed. Unfortunately, we are starting to do something after another tragedy, as in the case of atomic energy, a nuclear bomb, and it is important to think about it now.

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