

ARTIFICIAL INTELLIGENCE AND TRANSFORMATION OF THE ADMINISTRATIVE FUNCTION*

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Abstract

Subject. The article discusses how management transforms as artificial intelligence gets more important in governance, production and social life.

Objectives. We identify and substantiate trends in management transformation as artificial intelligence evolves and gets more important in governance, production and social life. The article also provides our suggestions for management and training of managers dealing with artificial intelligence.

Methods. The study employs methods of logic research, analysis and synthesis through the systems and creative approach, methodology of technological waves.

Results. We analyzed the scope of management as is and found that threats and global challenges escalate due to the advent of artificial intelligence. We provide the rationale for recognizing the strategic culture as the self-organizing system of business process integration. We suggest and substantiate the concept of soft power with reference to strategic culture, which should be raised, inter alia, through the scientific school of conflict studies. We give our recommendations on how management and training of managers should be improved in dealing with artificial intelligence as it evolves. The novelty hereof is that we trace trends in management transformation as the role of artificial intelligence evolves and growth in governance, production and social life.

Conclusions and Relevance. Generic solutions are not very effective for the Russian management practice during the transition to the sixth and seventh waves of innovation. Any programming product represents artificial

technology, soft power, robotics intelligence, which simulates a personality very well, though unable to substitute a manager in motivating, governing and interacting with people.

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Introduction

Artificial Intelligence (AI) can become one of the breakthroughs of the Industry 4.0, according to K. Schwab, founder and Executive Chairman of the World Economic Forum. AI will be driven by robotics and unmanned aircraft [1]. Russia's President Vladimir Putin says that AI is a resource which endows countries or some corporations with enormous competitiveness¹. The vital issue Russia needs to solve for its future viability is to become a global leader in AI.

Currently, AI, robotics, Internet of Things make the society progress and underlie the economic growth, influencing more and more on the daily life of people. For instance, as the digital economy spreads in the society and reshapes the labor market, businesses benefit as they expand their staff's capabilities due to the digitalization and robotification. Electronic document flow and digital platforms make the performance of businesses, companies, social security and educational institutions and public authorities more robust and transparent. Activities, business processes, related management practices and task will be revised and transformed so that employees and machines could reach the higher effectiveness together [2, 3].

The USA and EU investigated the process in the 2000s and subsequently formulated the so called the 2040 Concept (the USA) and the Fourth Industrial Revolution (the EU) in 2013. They did it for the same purpose of creating the AI, conducting the comprehensive robotification and engendering the self-programming of nature-like technologies and operating innovations online with the view of the menacing scenarios for people and the emergence of serious threats to would-be rivals (competitors). The USA, China and the EU have outlined their national strategies for the AI development. For example, the

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¹ *Putin: RF sposobna stat' odnim iz global'nykh liderov v oblasti iskusstvennogo intellekta* [Putin: Russia can become one of the global leaders in the artificial intelligence]. TASS. URL: <https://news.mail.ru/politics/39420591/?frommail=1> (In Russ.)

European Commissions prepared the White Paper on Artificial Intelligence, which mainly call for human control over machines².

To lay out a wider path for the European companies to high-tech markets, the EU adopted the European Strategic Program on Research in Information Technology (ESPRIT), which was an integrated program encouraging the establishment of powerful alliances of industrial enterprises in the EU, which would be able to compete, first of all, with the U.S. and Japanese corporations, and concerted R&D initiatives on integrated broadband communications (PACE) to conduct joint R&D projects on artificial intelligence (EUREKA), particle accelerators, high-power lasers, big PC, new materials and optronics.

Advanced economies of the West have a kind of a five-year plan (and respective funds) to start new technological phases (six and seven). As part of the activity, they intend to increment the speed of communications and technologies and types of hacking and information products, and promote the transparency and electronic communications³. In China, governmental authorities and businesses finance only respective R&D projects that are launched by startups that use 5G technologies, integrating the time (the fourth wave) – space (the third wave) – consistency (for rapid decision-making during chaotic developments in the environment) and the robot (machine) – surgeon (man).

Implemented as part of the Internet of Things, such methodologies are mainly based on accomplishments of the fifth wave of innovation, tending to the Internet of Things, i.e. the sixth wave of innovation. The sixth wave of innovation features nano-, bio- and creative technologies, robotics, AI and flexible production automation [4]. The G7 advanced economies accelerate their research on the sixth and seventh waves of innovation and finalize the fifth one with multiple chips for AI modeling and self-programming robots (cyborgs) and their sets. As machines, robots are supposed to pass the Turing test by 2029⁴, engendering the AI and machine thinking that would surpass the human mind and the human brain thinking process respectively.

AI systems (robots) will declare about their mental ability and consciousness⁵ and claim civil rights like humans have. The freedom of operation and a choice of programs have given related threats and hazards to individuals and the humankind as a whole. Robotics will be able to integrate additive physical and systemic network types of intellectual capital. Under such circumstances, one cannot but guess that machines be cognizant of their lives and their rules. Another threat lies in side-effects of S&T progress on the evolution of the society and people [5]. That is, there is a room for the paradigm-free (in terms of stewardship), regularly self-organizing and mainly chaotic fuzzy situation.

² Loriya E., Nodel'man V. *Igry bez razuma: chto nam dast i chego lishit iskusstvennyi intellekt* [Playing without mind: What can the artificial intelligence give or take from us?]. URL: <https://iz.ru/869200/elena-loriia-valeriia-nodelman/igry-bez-razuma-chto-nam-dast-i-chego-lishit-iskusstvennyi-intellekt> (In Russ.)

³ As the global computer network, the Internet reflects laws and rules of any networks, though flat. Therefore, hacking attacks of the Protestant ethics of management reveal forward-transfer errors to vertical hierarchies (the third and forth waves of innovation) of IT.

⁴ Forecasts by R. Kurzweil from 2019 through 2099. URL: <http://giraffebig.ru/prognozy-reya-kurtsvejla/> (In Russ.)

⁵ Collective identity of multiple AI can, in theory, reproduce the managing AI. If the specific concentration of AI per unit of data is rather high, the form of life can change.

Currently, the USA, Japan and China strive to promote and apply high and science-intensive technologies shaping the seventh wave of innovating. These include quantum technologies, photonics, micromechanical engineering, robotics, global information networks, further advancement of nano-, bio- and creative technologies and respective systems, AI and quantum computers, research into human brain and mind [6]. As individuals' thinking processes and communication with human brain will continue and push the above technologies forward, there will be even less difference between the natural and artificial intelligence⁶.

Human brain and its processes are expected to be totally studied by the end of the 21st century. Concurrently, people will be integrating with computers through cyberimplants at the mental and physical levels. AI systems, which exist solely as computer programs, will gradually outgrow people in numbers. Electronically controlled mathematical thinking processes will transform public relations through computational abstractions into the emotionless systemic and visual world, where an individual will be *obsolete* as compared with new technological requirements. People will have a growing need in additional electronic and biological means to catch up with the dynamic external environment absorbing new high technologies. For example, the AI/Artificial Life project is an attempt to eliminate limited capabilities of people, assuming that the Nature endowed them with ability to disperse in the universe as immortal spirits after being computer processed, or negate themselves to become post-biological forms of mind and life. If such a scenario comes true, humans will extinct species, which robots will take care of in the best-case scenario⁷. Technological singularity will seem threatening when both people and the AI no longer understand the S&T progress due to its complexity and dynamism [7].

Biotechnologies will alternatively and abruptly open up new capabilities of human brain. Biocomputer systems will be needed as they ensure the interaction of organic and artificial systems. Individuals will be able to merge their mind with computers connected to the Internet and directly upload information from it. As part of the seventh wave of innovation, cognitive science takes a special position. It is a cross-disciplinary line of research that unites theories of cognition and artificial intelligence, neurophysiology and cognitive linguistics and psychology. Synthesizing the respective techniques and technologies, it will bring administrative mechanisms of economy, State and society to an absolutely different level [1, 8].

Russia also pursues the status of a principal technological center and global leader in the development and distribution of brand new technologies, implementing its strategy for promoting the innovation and innovative activities of people and enterprises that feed the profitable part of the governmental budget. In the country, outlining the strategy

⁶ *Uchenye: skoro gadzhety smogut kontrolirovat' nash mozg* [Scientists: Gadgets will control our brain soon].

URL: [https://weekend.rambler.ru/items/42135412/?](https://weekend.rambler.ru/items/42135412/?utm_content=weekend_media&utm_medium=read_more&utm_source=copylink)

[utm_content=weekend_media&utm_medium=read_more&utm_source=copylink](https://weekend.rambler.ru/items/42135412/?utm_content=weekend_media&utm_medium=read_more&utm_source=copylink) (In Russ.)

⁷ Kuz'mina N. *Lyudi – vymirayushchii vid. Proshloe I budushchee glazami futurologa Reya Kurtsveila* [People are extinct species. The past and future as seen by R. Kurzwell].

URL: https://aif.ru/society/science/lyudi_vymirayushchiy_vid_proshloe_i_budushchee_glazami_futurologa_reya_kurtsveila (In Russ.)

encouraging entities that design robots and artificial intelligence for them, ROBOLAW Research Center for Problems of Robotics and Artificial Intelligence Regulation proposed the convention on the robotics and artificial intelligence in 2017, which is included into the Digital Economy program⁸. Incidentally, Vladimir Putin suggested that the Russian companies and professional community should set up a code of ethics on the interaction of people and artificial intelligence⁹.

Currently, there are producers of supercomputers in Russia¹⁰, which are the first and foremost carriers of artificial intelligence. There is a respective market in the country (*Fig. 1*).

The management is at the post-Taylorism phase, meaning that there is not a new paradigm¹¹ due to:

- 1) changes in properties of professional disciplines and their variety;
- 2) bifurcation of the trajectory developments and a growth in critical points of such changes under the Feigenbaum rule [9] (as a function of 4.66) or the Fibonacci numbers;
- 3) properties of management as a set of current indicators as compared with dynamic variables, which often have no relation to trajectories;
- 4) as direct technological relations among employees, the status of management evolves and morphs into the strategic culture of innovation that implies possible synergistic effects, self-government and self-organization;
- 5) meager growth rates of Russia's GDP, multiple unprofitable enterprises and an administrative apparatus that has multiplied from 2000 to 2019 are all indicative of the poor management practices in Russia that tries to leap into the sixth wave of innovation, drawing upon results of the fifth one (information-based wave).

Management theories are inadvertently lagging from rapidly advancing technologies, including hazardous ones for the Man to Man relationships, results of the new technologies. There may be no sense in forward-looking research into the sixth and seventh waves of innovation with reference to management as a coordinating link between Man and Man. They may also take place in any other area. That is, as supposed

⁸ Balashova A., Posypkina A., Balenko E. *Feiki i roboty: kakimi budut glavnye tekhnologicheskie trendy 2019 g* [Fakes and robots: The main technological trends of 2019].

URL: https://rbc.ru/technology_and_media/03/12/2018/5c051d5d9a7947c4ecd961ae?from=materials_on_subject (In Russ.)

⁹ *Putin predlozhit' pravila vzaimodeistviya cheloveka i II* [Putin suggested outlining the human and AI interaction rules]. URL: https://piter.tv/event/Putin_predlozhit'_pravila_obscheniya_cheloveka_s_II/ (In Russ.)

¹⁰ For example, Christofari supercomputer was designed by SberCloud, Sberbank's subsidiary, in collaboration with Nvidia. It includes high-production nodes NVIDIA DGX-2 that are based on computational accelerators Tesla V100 (6.7 petaflops). Its capacity goes the 29th worldwide and seventh in Europe by capacity.

¹¹ P. Drucker called it the epoch without rules.

by Industry 4.0, knowledge and properties of the artificial intelligence will interact (without any manager aside) with other people and contents (unmanned robotified facilities).

Considering undeniable and subjective facts, we can emphasize the following:

- 1) the Russian managers mean logos (mind, thinking) is the original reason for everything as opposed to the European managers who consider effect as the primary substance;
- 2) Russian has needed weapons, tools, technologies, Western management mechanisms since the 18th century, which, however, were to an extent adapted to the Russian customs;
- 3) in the 21st century, sanctions untapped inexhaustible resources for Russia's development. However, ineffective management, a lack of investment dictated for a scientific and technological breakthrough;
- 4) although the fifth wave of innovation generated substantial accomplishments in the military-industrial complex of the USA and NATO as the network-based management spread worldwide, the USA is undertaking the backward industrialization, seeing the escalating tensions all over the globe. Russian needs to retrofit its base as soon as possible through technologies and methodologies implied by the fifth, sixth and seventh waves of innovation. Then the science and practice of artificial intelligence and ultimate priorities of the cyberspace will focus on multiple aspects.

However, if the Russian managers use the Western technologies of the fifth wave of innovation, there may be possible attacks of unmanned aircraft, shutdown of the Internet, etc.

Vytautas Andrius Graičiūnas¹² proposed the daily relationships model x for conventional management if $n = 4x = 44$, if $n = 5x = 100$, if $n = 15x = 245,970$ and so on, which represent various and serious threats to human managers¹³. Although still being important for human activities, such motives as the professional career, self-esteem and satisfactions are no longer included in management techniques. In the mean time, it happens so that a 10-percent increase in the number of customers and galloping growth in the IoT (in the case of Management 2.0 and 3.0 that collectively create the content) cause a disproportionately high growth in the demand and threats, including new threats, such as security threats (unstable operations), disintegration of the Internet (connections), equipment reliability threats, etc. Escalating threats and conflicts engender (even snowballs) multiple directions, complexity, rivalry, chaos online.

¹² Graičiūnas theory and its application in management. Management rules.

URL: https://studwood.ru/1112393/menedzhment/teoriya_greykunasa_primenenie_menedzhmente_normy_upravleniya

¹³ If four subordinates are directly accountable to the manager, they will have about 44 disputable issues, discrepancies daily and, therefore, appeals to the manager to settle them.

Management Digitalization

In the era of digitalization, Big Data and Data Mining, technologies enable people to coordinate the management performance online¹⁴, accomplish its most arduous functions, specify what role the human factor play in the business process, and delegate just the goal-setting and software-based decision making to people. The memorizing function is assigned to chips. According to Microsoft and Google, they will be responsible even for thinking as well.

Employing its advanced science and technologies and imposing sanctions, first of all, the USA coerces the escalation of the daily digital warfare against, *inter alia*, the Russian government, by integrating malicious codes and distinctions of the strategic culture of corporations, regions, nations, etc.¹⁵. However, the U.S. administration keeps some stereotypes, such as the hybridization of relationships, neglection of any compromise, focus on the cyber deterrence, informational domination over competitors, etc. Enhancing the soft power of digital technologies, the USA and the EU have been trying to integrate Management 3.0 (the fifth wave of innovation) at least since 1997, while developing the fifth wave of innovation as the ecosystem platform through the encryption, voice and graphic control, blockchain, etc. Digital integrative platform infuse the sociocultural content into management.

Finalizing the era of conventional governance, Industry 4.0 ignited energetic debates in Russia, due to:

- the ambiguity of its concept;
- non-existent program for the AI comprehension;
- spasmodic effects affecting a human manager;
- the emergence of the so called sixth wave of innovation preceding the AI;
- chaotic behavior of arbitrary crossings of trajectories from the third to the sixth waves of innovation;
- persevering management free from any paradigm as a result of coordination (that is, the outcome of Industry 4.0 as a new self-organizing semi-sixth wave of innovation can be represented with an intellectual set of standalone robots, IoT mechanisms and Internet of Personalities given people have chips implanted during the robotification programmed by people);
- a non-existent backlog of modern theories of management looking farther than 2040;

¹⁴ Given references to relevant publications (n Hirsch index) > 100 people, the manager assumes the role of a third-party observer and coordinator.

¹⁵ [The leadership principle of the USA: Science is a method to convert money into knowledge, while innovation is just a means of converting knowledge into money]. *Voенно-promыshlennyi kur'er* = *Military-Industrial Courier*, 2019, no. 30.

- low productivity of hackers in comparison with the AI¹⁶.

G. Malinetskii offered the concept *the rapidity of the world*, which treats the human factor, say, a human manager, through the lens of sets of communicating robots. He assumes the human factor be the most troublesome¹⁷ and slow¹⁸ element in global and local (cluster) computer networks. In opinion of Aleksandr Bartosh¹⁹, the human factor will be disregarded when machines master self-programming.

During the transition to the sixth and subsequent waves of innovation, the strategic culture of innovation is based on the cognition, AI and science. It contributes to the development of technologies and theories in modern management. It rests on management, which usually includes:

- a plan, a model, a position, prospects, maneuver;
- basic key (plan) to the baseline strategy [10];
- a choice of an advantage gaining method;
- an approach during the emergence of the digital economy just as if the circumstances the manager were in at the moment or as the possible goals the manager wants to achieve.

The scope of management includes aspects of management after the bifurcation, reflect the rule of the Fibonacci numbers, i.e. it is a *fragmented-but-linear* (without treating properties of the system as properties of its constituents). Due to the integrative effect of *science* and *the item*, the scope is explained with boundaries of the human factor and certain business processes. Analyzable questions arise as a set of independent issues through *the respective horizon of events*, not only with respect to the organizations, but rather *self-fulfilling environment of the cyberspace and blockchains*.

During the sixth wave of innovation, the manufacturing, agricultural and transportation sectors will be almost 100-percent automated. That is the reason why managers will have to master unmanned production management techniques.

From perspectives of developers of robots' AI, it is an ordinary engineering discipline, though quite sophisticated, a set of mathematical and engineering methods for the

¹⁶ Two groups from the USA and the EU were asked to detect susceptible sections in the competitor's networks, without being noticed. The first group was represented by renowned IT professionals of the Western countries. The second group consisted of military hackers from the USA, who used the AI. It took 0.7 second and 1.4 second the military hackers to discover the brittleness in the controllable network and penetrate it respectively. It took 4 minutes and 1.5 hour the best IT professionals to detect the brittleness and penetrate the network respectively. Thus, the productivity of hackers, who use the AI, was 34.3 times as high as the Europeans and 385 as fast as them respectively.

¹⁷ The human factor was proved to be responsible for 20–30 percent of breakdowns in complex systems.

¹⁸ Satellite (navigation) systems, like GPS and GLONASS, lag by 140 milliseconds, while human response is 100 to 1,000-fold slower.

¹⁹ Bartosh A. *V chem sila Podnebesnoi. Osobennosti strategicheskoi kul'tury* [What is the power of the Celestial Empire? Distinctions of the strategic culture]. URL: <https://centrasia.org/newsA.php?st=1559967720> (In Russ.)

optimization and machine learning, which enable the development to simulate cognitive functions of humans. Developers should meet the following requirements of managers.

1. What poses one of the most essential difficulties is understanding algorithms of the AI and machine learning. Hence, developers should have a 100-percent access to software driving the logic of decisions made by the AI of robots and their interaction in the system. That is, software should be transparent for those who have access to its, i.e. programmers and developers.
2. Software shall be free from any discrimination, testable, reproducible and safe.
3. There should always be those who are responsible for the overall creation of the AI system, software development and its adaptation to business processes.

In the mean time, the manager should comprehend how the process can be optimized, arrange for this and provide a developing programmer with a map of the respective business process so that the developing programmer could design software that would be best-fit for the robot. Managers should also hire programmers who not only have appropriate professional knowledge and skills, but also understand the ethics and moral aspects so as to ensure the security of people and the production when programming the AI of the robot.

Recommendations

If the management target in the human mind, as a cognitive phenomenon under the theory of brain, determined the preceding knowledge, its conceptual image – the subject is a thing. Consequently, the Russian managers need to have an effective and scientifically grounded method (and the entire methodology) to handle scientific and applied concepts on administration and management, which gain momentum, in line with the following principles: a) multiple aspects; b) valuable information and cognition; c) self-management as the supreme form of self-organization; d) non-linear dynamism; e) hierarchical and network structure; f) optimality; g) controllability; h) adaptivity; i) integrity; j) no discrimination; k) transparency, safety and environmental sustainability; l) reproduction; m) intuitive foresight; n) the strategic approach based in the culture and risk as strategic management ingredients.

According to Vladimir Putin, a focus on the AI shall permeate any profession in law enforcement, healthcare, education, business and economics as a whole, and powers that be²⁰. These are high-profile professionals who are capable of creating AI systems. Therefore, professional people should be competent in new technologies handling Big Data, distributed ledgers (blockchain), artificial intelligence, virtual and augmented reality, machine learning, etc. There should be a generation of professionals (Big Data processing, computational linguistics, mathematicians, programmers) in Russia, who

²⁰ *Putin: RF sposobna stat' odnim iz global'nykh liderov v oblasti iskusstvennogo intellekta* [Putin: Russia can become one of the global leaders in the artificial intelligence]. TASS. URL: <https://news.mail.ru/politics/39420591/?frommail=1> (In Russ.)

would fully unfold and employ the potential of the Artificial Intelligence, thus improving its quality and scope. Therefore, the Russian universities and colleges should be on top of the AI engineering technologies. Russia also needs scientific schools of management to perceive multiple aspects and a variety, chaotic behavior and uncertainty of the final phase of conventional management.

The future of management should be forecasted on a systemic basis, including the Russian practices.

People management is believed to depend on the artificial intelligence by 2040. As many aspects should be taken into consideration, there should a concept that would reflect the extent of the *human management* extinction by 2040.

Robotics and AI shall be governed with special laws, with the scope of the AI management, code of conduct and ethical standard being set with reference to the management of the AI.

In Russia, non-profit organizations and geographically dispersed ones, in particular, and the digital sovereignty should be especially coordinated to build a shield from the soft power of the Western digital technologies.

The development of the strategic culture of innovation requires a) the positioning of various principles and techniques with reference to Industry 4.0 for the sixth and seventh waves of innovation; b) the adherence to principles and techniques of the fifth wave of innovation in the Russian economy given scientific schools of management strengthen their missions and their intended function; c) drawing the attention of users of scientific schools of management RID, in coordinating their activities, on the individualized attitude, focus on the youthful and informal style of communication and governance, control over the external environment (specific research), concurrent centralization and decentralization of activities; d) the preservation of the previous practices in the Russian education at least for some time to incentivize scientific schools of management to methodologically go for the *digitalized* training and methodological processes. To prepare a new generation of prestigious talent, it is reasonable to systemically coordinate activities of scientific schools of management, while developing theories and technologies of management given the uncertain future, principles, concepts and the framework for business technologies as the *soft power*.

Considering a continuously changing, chaotic and threatening environment in the ever growing uncertainty and difficulties, we should remember that the strategic culture of innovation significantly depends on global opportunities of the fifth wave of innovation, when such opportunities are limited (within the scope of a particular matter) due to sanctions third-party competitors imposed on Russia and the need to actively design and implement the above culture in the sixth and seventh waves of innovation. By 2040, the Russian management practices shall mainly pursue a) the exercise of opportunities arising from the strategic culture of innovation as the soft power through a breakthrough of the Russian management in the sixth and seventh waves of innovation, circumventing the

fifth wave of innovation; b) the hybridization by wave of innovation; c) structuring that covers hypothetical, technological and general scientific aspects (phases, sections), research of scientific schools of management. Based on the analysis, self-assembly and management programs and existing virtual and real-life tools, including digital technologies, it is possible to build, given the future of management is uncertain, a special soft power even after 2020 provided that all meanings are taken into consideration. The soft power will translate into the strategic culture of innovation that contributes to the above breakthrough if Russia has an opportunity to confront with the technological pressure of the Western countries.

Conclusions

Although there is a brand new algorithm simulating neural connections. Based on the algorithm, the current generation supercomputers can reproduce the mammal brain in the real time. The human personality and a program are not one and the same thing. This will be an encrypted artificial intelligence, which will not be a personality, albeit simulating it precisely²¹. The artificial intelligence is incapable of replacing managers' functions, such as encouraging, guidance and personal interaction.

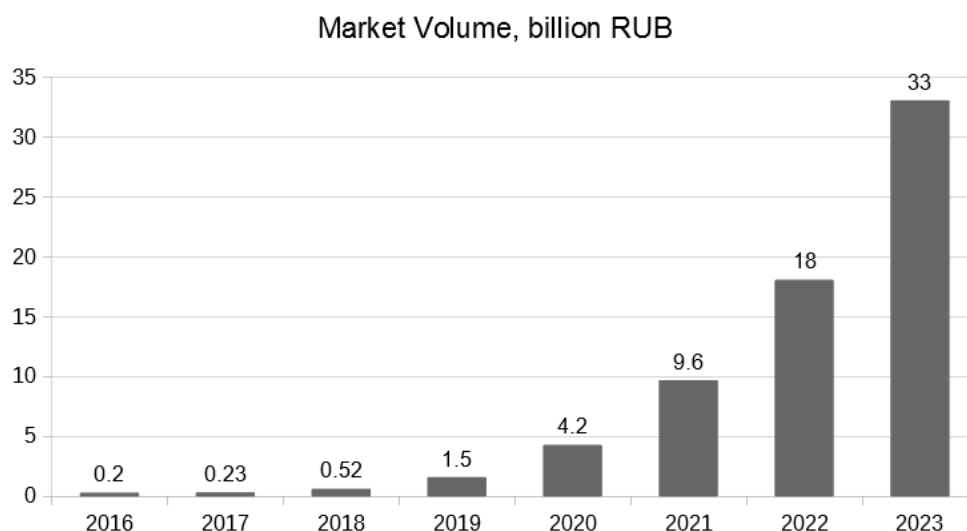
Generic decisions seem not very effective for the Russian managers when they transit to the sixth and seventh waves of innovation. In the 21st century, management should especially offer creative decisions from social perspectives [11]. For example, when individuals reach their declining years, managers might help them adapt to the environment so as to prevent the aging of the morale [12].

While the horizon of the Western-style management ends at the dawn of the fifth wave of innovation and the digital well-being of the sixth and seventh wave of innovation, the horizon of the Russian management and its digitalization are rather blurred.

Just as the concept of knowledge in the innovative economy transforms (after the transition of the fourth phase), the importance of knowledge grows throughout administrative levels, with knowledge become a more and more effective means of management in education, science, culture and public production. Conscious and scientifically verified decisions are indispensable without proper information and knowledge. Sound and up-to-date knowledge, capabilities of strategic management and innovation have grown into the most sustainable and valuable forms of capital in terms of better corporate performance. They strategically underlie any successful accomplishment in the time of the global competition of innovation. That is the reason why today's management paradigm, at list microeconomically, can be considered as a system of strategic management based on the entity's ability to flexibly and online respond as a situation may be, focusing on customers (corporate dynamism), horizontal ties and knowledge.

²¹ *My otvechaem na vopros, chto blokirovat', no poka ne otvechaem kak: glava Roskomnadzora Zharov dal interv'yuu RT* [We are trying to answer what shall be blocked, but yet silent how it should be done, Mr. Zharov, Roskomnadzor Head says]. URL: <https://russian.rt.com/russia/article/453383-roskomnadzor-zharov-intervyu-rt> (In Russ.)

Figure 1
The Russian market of Artificial Intelligence speakers, chat bots and AI assistants



Source: *Rossiiskii rynek razgovornogo AI, chat-botov i intellektual'nykh assistentov* [The Russian market of AI speakers, chat bots and AI assistants]. URL: http://mnmag.ru/article/detail.php?ELEMENT_ID=13871 (In Russ.)

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Conflict-of-interest notification

We, the authors of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.