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Digital Property and New Economic Relations

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ABSTRACT

Modern economic relations are developing under the influence of digital property that creates conditions for unprecedented socialization of production and new realities in the relations of appropriation and alienation. This requires both theoretical interpretation and practical research. The aim of the article is to identify current trends in the development of digital property and the new economic relations that it forms in the world, to systematize the conditions for digital property in Russia. The authors used the findings of institutional and evolutionary economic theories, political economy, as well as the principles and methods of SWOT-analysis in order to systematize the issue. The paradigm of the development of Russia should be changed from consumption to production of innovative products and technologies of the digital economy. The paper presents the essential characteristics of digital property and a model of the influence of the digital economy and global integration on modern economic relations. Potential opportunities for the economic development in the system of new economic relations were identified due to the SWOT-analysis of the conditions for the development of digital property in Russia. At the same time, endogenous institutional and target restrictions on the development of the digital economy in Russia (as weaknesses), as well as exogenous restrictions in the form of threats were specified. The authors found the strategic modeling of systems engineering education as a long-term basis for the development of the digital economy necessary. The research results can be used in developing national programs.

Keywords: property; economic relations; institutes; digital economy; economic structure; national economy; global economy

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INTRODUCTION

Developing digital economy and new technologies of the fourth industrial revolution is rapidly creating a qualitatively new environment in almost every area of life. According to the laws of dialectics, quantitative changes — mainly in software, computer technology and Internet communications — quickly switched to qualitative changes predetermining innovative products in the real sector (material and information, including through the active integration of these sectors), and also developing new business technologies and new technologies in the public sector. This leads to the realization that the humanity has found itself in a new era where countries are enormously integrated and connected and, at the same time, they are divided, not for technical reasons, but because of deep economic contradictions.

RESEARCH THEORY AND METHODOLOGY

The digital economy itself is still being comprehended [1, 2]; its main development indicators[1] are identified, the resource of digitalization in the real, financial and public sectors, as well as the management of the digital future are under study [3]. Rigorous research have been made to check if Russia is ready for the challenges of the digital revolution [4] and

[1] Abdrakhmanova G.I., Gokhberg L.M., Dem'yanenko A.V., D'yachenko E.L., Kovaleva G.G., Kotsemir M.N., Kuznetsova I A., Ratai T.V., Ryzhikova Z.A., Strel'tsova E.A., Fridlyanova S. Yu., Fursov K.S. Digital economy: a brief statistical digest. M.: HSE; 2018. 96 p.

negative externalities [5, p. 38–40]. The works by I.G. Salim'yanova and A.S. Pogorel'tseva [6, 7] presented the detailed analysis of the digital economy from the perspective of institutional theories.

The main primary aim of developing innovative technologies is accelerated economic growth. It requires rethinking of Keynesian and neoclassical models of economic growth from the perspective of a new wave of "industrial" revolution. In this regard, the research by some outstanding scientists should be noted: J.R. Hicks suggested that innovations (technical changes) can be interpreted as shifts in the production function; R. Solow believed that the main factor in dynamics and long-term economic growth is technological progress; J. Schumpeter gave pride of place to innovations, but behind the innovations he saw entrepreneurs whose actions cause economic growth influenced by new combinations of factors of production; P. Romer considered growth in R&D investment and investment in human capital as the main factor in economic growth. Prognostic development models are based on these theories, confirming the importance of innovative factors [8].

Analyzing the discussions and the economy digitalization, we have revealed the dominance of a technocratic approach (everybody speaks about technology, artificial intelligence, neural networks, distributed ledger systems, blockchain, Internet commerce, etc.), while the significance and essence of economic relations are leveled out. Nowadays, a balance and integration of various approaches in solving the problems of the digital economy is needed more than ever: economic, managerial, engineering ("technocratic") and legal [9]. (The significance of these approaches is not determined by this listing order).

At the same time, revealing the essential characteristics of modern phenomena and processes based on economic theory, primarily political economy and evolutionary and institutional synthesis, is very significant, but often refused. Namely, the development of new economic relations is not observed for all digitalization processes. The non-mythic nature of economic relations and their asymmetric development regarding institutions is proved by a vivid example of the cryptocurrency market not institutionalized (by law) in Russia. Noting endogenous institutional changes as a reflection of social dynamics is not enough [10]. It is important to consider the interaction of institutions and economic relations, whose core are property relations. As an ever-increasing part of the real economy, the digital economy transforms its internal ties and relationships and will have an impact on applied economic sciences. For example, those related to the analysis of big data, accounting, taxation, moving information technology finance, new management models due to changes in transaction models, etc. However, studying the impact of the digital economy (as part of the real economy) on economic theory, or rather, their dialectical relationship is important for us. We see the potential in evolutionary and institutional theory and political economy that explores economic relations. At the same time, we do not neglect the study of economic behavior, individual phenomena, and the phenomena as the basis of a positive analysis demanded by the positive economy. However, by isolating individual phenomena, this approach tears the problem apart and sometimes leads away from the systemic vision. Sometimes the article will present the subject to the detriment of a positive detailed analysis; sometimes there will be an expert opinion, based on a comprehension of real facts, trends and the methodology provided by political economy. The methodology is about developing productive forces aided by economic (production) relations. The evolutionary and institutional theory also speaks of the significance in the systemic vision of the essence of economic phenomena — institutions of different levels and temporary effects.

RESULTS AND DISCUSSION

In general, the digital economy is the economy of technical innovations that become the driver for development in all areas of the economy. At the same time, they embrace new innovative resources and become accelerators in the economies of countries with these resources. This does not contradict official approaches. The program "Digital Economy of the Russian Federation" (approved by the Government of the Russian Federation in its resolution No. 1632-r dated July 28, 2017) suggests that the digital economy is markets and industries, platforms and technologies, and the environment (normative regulation, information infrastructure and personnel) where economic agents carry out economic activities. Its key factor of production is digital data. We emphasize that behind all the technologies in the digital sphere, one should recognize the owners of new digital resources who build new economic relations by their means. An essential study of these relations will provide a synthesis of evolutionary and institutional theories (*Fig. 1*) [11].

Economic relations formed under the influence of economic interest [12] are reflected in institutions, and the viability of the ideas [13] is refracted through economic relations.

Unfortunately, Russia's role here is not significant, since it is neither a dominant owner, nor a manufacturer of modern digital products, programs or technologies. Due to digital technologies and paralleling various sanctions, Russia is imposing the role of a raw materials appendage: we are increasingly absorbing imported digital products (of various origin, Chinese or American-Chinese production) in exchange for non-renewable (or restored over a period longer than human life) resources: oil, gas, forest, etc. It must be admitted that Russia is trying, but cannot change the paradigm of raw materials development to the paradigm of the producer of new innovative (and, above all, digital) products. Russia still consumes innovative products (in exchange for natural resources), but practically does not create new ones. Institutions (formal and informal) fail to change the development paradigm of Russia.

A new production socialization level and new factors creating profit predetermine the need to reveal the essential characteristics of modern phenomena and the processes, based on building new economic relations under the influence of new digital property. At the same time, digital property is a new asset that creates value based on innovative IT products. They include integrated products combining the developments in IT and other real sectors, and corresponding to the new technological structure. Active digital property in innovative industries is presented by ownership of the means of production, technology, IT products (programs, databases, information media), and passively — as registered (patented) intellectual property. This property is involved primarily in economic relations in the production process, and as a consequence, in the processes of exchange, consumption and distribution. It is the production of innovative products of the digital economy that determines the legal owner, having all main authorities: ownership, use and disposal, and which is the main beneficiary — profit. At the same time, these authorities may undergo significant transformations. In this regard, the idea of "economic relations between machines" and "relations" with artificial intelligence comes up inadvertently (or nevertheless intentionally) [5, p. 132, 145]. The question arises: is it so not to see the owners behind machines and technologies? New digital technological ways are building new global value chains, whose management is theoretically justified now [14].

The study relies on the SWOT analysis, since the SWOT analysis emphasizes the tough competitive environment for developing digital property. We did not place this approach in the theory and methodology section, as it is only a way of structuring the problem, possibly controversial. However, striving for normative analysis, we believe that the SWOT

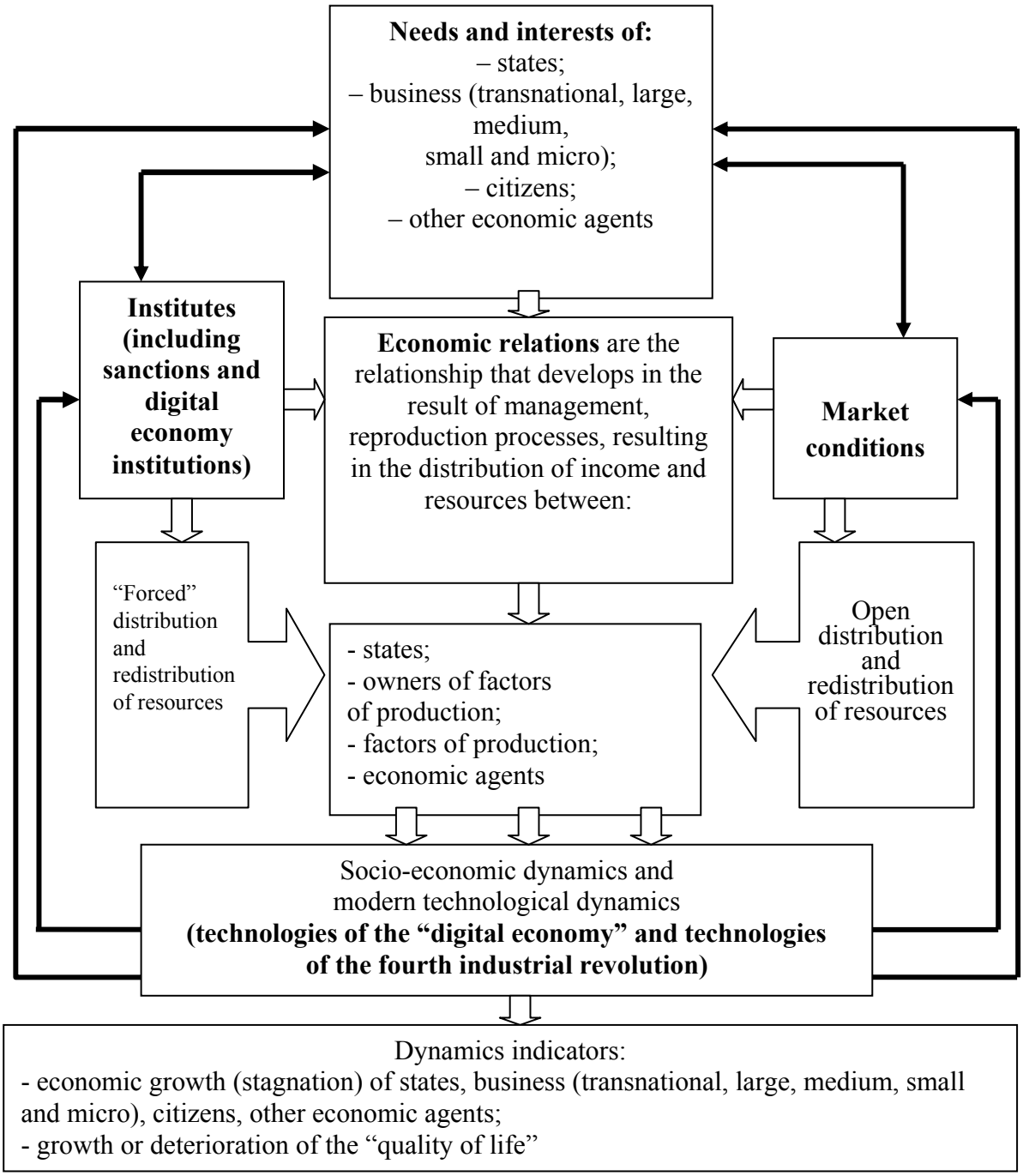

Fig. 1. **Influence of the digital economy and global integration on modern economic relations**

Source: developed by the authors.

analysis allows revealing possible ways of development and overcoming negative trends (see *Table*).

WEAKNESSES

— The digital economy development paradigm in Russia is consuming, rather than producing; the main software products, technological and material resources are not of Russian origin. The consuming paradigm can bring a short-term effect, in theory regarded as a "middle-income trap" [15–17].

— In formal institutions, this paradigm is settled (indirectly) as a normative regulation of the digital economy development of Russia. The programs are more focused on developing

Table

Analysis of the conditions for the development of digital property in Russia

Weaknesses	Threats
1. Inadequate digital economy development paradigm	1. Overconcentration of digital property in certain countries and its "self-growth"
2. Regulatory documents for the digital economy development oriented to resource development	2. Well-established partnerships between the main players in the digital market
3. Informal institutions: "career growth, and not the realization of a person's creative potential"	3. "Part dependence" effect
4. Emasculation of a scientific systemic approach in the educational process	4. Profit growth due to after-sales service of software (and other innovative) products
5. Minimum amount of digital property	5. Intellectual property protection institute, in-house privacy policy
6. Inefficiency of state innovation projects in the real sector and institutions of responsibility	6. "Brain drain"
Strengths	Opportunities
1. Consolidating leader and political will	1. Development of educational potential and building an "engineer of the future" model
2. Institutional framework for the development of the producing digital economy	2. Prestige of an engineer in society
3. Initial consuming phase as potential	3. Active state support for effective domestic companies that have realized themselves in the digital economy market
4. Examples of successful implementation of digital technologies in government agencies	4. "Innovation responsibility centers" and the "institute of responsibility" of state managers
5. "Innovation growth points" of the producing digital economy	5. Prioritizing the development of the producing digital economy
6. Domestic education system, priorities in financing science and grant support for scientists	6. Recruiting leading engineers

Source: developed by the authors.

resources, rather than achieving breakthrough results in the form of innovative products and technologies. The expert group of the Financial University concluded that these forecast indicators of the socio-economic development of the Russian Federation do not correspond to the implementation of breakthrough scientific, technological and socio-economic development of the Russian Federation, including the priorities, potential and tools for the digitalization development in the real sector [18].

— Informal institutions and real economic relations develop youth guidelines not to realize themselves as a creator, especially in high tech, but to build a career, mainly in management; the contemporary ideals of a successful life are the career of a top manager as a Russian dream.

New educational standards FSES 3 ++ in engineering for postgraduates, the normative documents, reinforce the position that managerial competencies are of a higher level than the technical ones. Here come prioritizing of education and constructing a model of a future economy that has no future. There are strong incentives for engineers to leave the profession. They are preserved after the university. Leadership and building a manager's career are an imposed (or not imposed?) ideology, which should be opposed by the idea of professional development and self-realization (not only in the engineering, but also at this stage of world development; this is especially sensitive for this sphere).

— Introducing the competency-based approach in Russian education system used to be and is now based on emasculating the knowledge-based approach; the ultimate goal as a competence — is a form, not the essence, of the educational process. Ultimately, this adversely affects the development of the real sector and advanced technologies. The new economy (postindustrial, informational) was initially presented as a knowledge economy (rather than a competency economy), and this was a more accurate definition that reflected the importance and priority of intellectual capital at the present stage of world development. Science itself is a certain system of knowledge that cannot be replaced by a set of competencies. Integrating a competency-based and knowledge-based approach in the education system will allow Russia to overcome the trend of Western digital technology consumption and move to the economic development paradigm of Russia as a producer and, possibly, eliminating prohibitive barriers and sanctions — as an exporter of these technologies. This is especially significant in educating engineers (including IT engineers).

— Contemporary institutions and economic relations insufficiently promote investments in digital property in the form of intellectual property (regulated by patent law), implemented technological projects, software products, high-tech products and other components that characterize and are a condition for the development of technologies of the fourth industrial revolution (as well as subsequent "waves"). As a result, the minimum size of "producing digital property" does not contribute to its concentration. Therefore, Russia does not have a large sector or integrated "digital clusters" in the economy ("producing digital clusters") with a stable financial, material and human potential that would determine the innovative digital area of the development of the domestic economy.

— In Russia, we are witnessing the inefficiency and sincerity of corporations and structures funded by the state, called to be drivers for the development of digital technologies. (Although in this case, efficiency could be interpreted not only from the perspective of traditional economic indicators, but as dominance, capturing of the market (for the medium term). All these projects demonstrate the development of resources, and not the creation of innovative products and technologies that correspond to the new technological structure. In addition, these corporations are focused not on research-based effective projects, but on a management class formation, the main recipient (consum-

er) of the resources. Moreover, the inefficient management is relayed to higher education as the "best practice".

THREATS

— The concentration of digital property in companies with a specific country affiliation is increasing in the world. If the large property of the banking sector, pharmaceutical, energy companies is scattered around the world [for example, in the automotive industry — these are Ford (USA), Toyota (Japan), Volkswagen (Germany), Hyundai (South Korea), Volvo (Sweden), etc.], digital property demonstrates the implementation of a successful strategy to capture the market between the two countries. The annual report by former Morgan Stanley analyst and well-known venture investor Mary Meeker shows the largest technology digital companies in the world and their level of capitalization: all the 20 leaders from the USA and China, their total capitalization is $ 5.9 trillion. [To compare, the revenue part of the Russian budget in 2018 was 15.26 trillion rubles, including oil and gas revenues — 5.48 trillion rubles, not dollars. Accordingly, based on the weighted average dollar exchange rate for 2018 (62.7078) — 0.243 trillion dollars and 0.087 trillion dollars]. At the same time, 75% of the cost is US digital property, and 25% is the property of Chinese companies. The leading six companies (out of 20) account for 81% of the total market capitalization of the rating (incredible concentration of property!). These are American companies Apple, Alfabet, Amazon, Microsoft and Chinese companies Tencent and Alibaba 2. Microsoft demonstrates the following financial indicators: capitalization — exceeded $ 1 trillion; the revenue and the net profit for 2018 were 125.8 and $ 39.24 billion (110.4 and 16.57 — for the previous period) 3. Interfax also reports that Microsoft's activity (property) is developing due to the revenue from the sale of software products (including for servers), the sale of cloud services; the revenue from professional networks and advertising in search engines is growing.

— Leading companies in the digital market rely in their development on well-established partnerships allowing them to maintain monopoly in the long term; moreover, the connections and the cooperation have an economic effect.

— There is a "part dependence" effect (dependence on the previous development path) in any technology, including digital technologies. It happens if this technology is built-in and acts in the way that the rest resources and the whole system can no longer work without it, since these resources had been mutually tuned before. Removing or replacing a high-tech product is almost impossible, only improving based on compatibility with the elements of the entire system is possible. That is, the creation of an innovative product involves either embedding it in an existing system, or requires building a new system for the product, which implies direct investment, as well as investments in setting up the entire system, including staff training. Therefore, the technology, the system and the high-tech product are parts of the property predetermining economic relations in already established markets and the behavior of the main owners of this digital property. The dominance and monopolization of these markets (as well as associated markets) will be supported due to this effect.

— Most digital products sold require after-sales service. Any software product, unlike a non-digital product, has a unique property — improvement, updating, and therefore, after it is sold, its service will be sold for a long time. Due to this, the digital content producer has constant resources for its own development. In the real sector (mainly the oil and gas), when transiting to market relations, foreign ERP software (production enterprise resource management system) was introduced. Its an-

[2] URL: https://bcs-express.ru/novosti-i-analitika/top-20-krupneishikh-tekhnologicheskikh-kompanii-mira) (accessed on 25.11.2019).

[3] URL: https://www.interfax.ru/business/669682 (accessed on 25.11.2019).

nual maintenance amounts to 20% per year of the initial product cost. It demonstrates the economic growth of digital property due to this resource.

— The intellectual property protection institute, an in-house privacy policy — all this will work against Russia in the long term if Russia does not become the legal owner of intellectual and digital property, at least in certain breakthrough directions.

— Moreover, there remains the threat of a "brain drain", as part of the youth do not see prospects for realizing their own potential.

Strengths and opportunities are the support and the prospects possessed by Russia to take its rightful place in the global economy, where it will have competitive advantages in the new economic structures.

STRENGTHS

— For Russia, it is important to have a consolidating leader when developing a producing digital economy. There is a political will towards the priority development of the latest technologies.

— Institutional framework for the digital economy development has been created. The basic regulatory documents are: the state program "Information Society for 2011–2020" 4, the program "Digital Economy of the Russian Federation" 5, the strategy of the information society development in the Russian Federation for 2017–20306. It is important that intellectual property protection institutions have been built.

— The initial consuming stage of digital achievements in various fields (including in the real sector, which constitutes the previous technological order, in the nascent and developing companies of the new fourth industrial revolution, in the public sector, in the banking sector and in education) is a necessary potential and condition for the emergence of a new manufacturing digital property;

— There are good examples of successful introduction of digital technologies in government agencies — in the Federal Tax Service, as well as the Central Bank of the Russian Federation and Sberbank of Russia — but these are not producing sectors and not the real sector of the economy.

— The so-called "producing" digital property in Russia is the active and powerful development of domestic companies in the field of software development, primarily for the domestic market): for automation of management, accounting and tax accounting and control (this property is developed mainly within national borders).

— The system of domestic education retains its potential. However, this strength has its flaws, which can transform it into a weakness. In addition, a system of grant support for scientists (including young ones) in priority areas has been built. The educational potential of Russia and Russians is the long-term basis for economic development, stability and overcoming crises. This is the intellectual capital enclosed in each person allowing them to adapt and improve in the rapidly changing conditions of the digital economy.

OPPORTUNITIES

— The education system should be paid special attention so that it does not lose its accumulated potential because of permanent reforms, and indeed, is a strength and source of opportunities for the development of the digital economy. Based on the earlier economic and mathematical analysis (according to the statistics from the regions of the Central Federal District), in particular, we examined the relationship between gross regional product per capita and such an indica-

[4] The state program "Information Society for 2011–2020" was approved by Decree of the Government of the Russian Federation dated 04.15.2014 No. 33 (as amended on 12.30.2018). URL: http://www.consultant.ru (accessed on 06.01.2019).

[5] The program "Digital Economy of the Russian Federation" was approved by order of the Government of the Russian Federation of July 28, 2017 No. 1632-r. URL: http://www.consultant.ru (accessed on 06.01.2019).

[6] The strategy of the information society development in the Russian Federation for 2017–2030 was approved by Decree of the President of the Russian Federation dated 09.05.2017 No. 203. URL: http://www.consultant.ru (accessed on 01.06.2019).

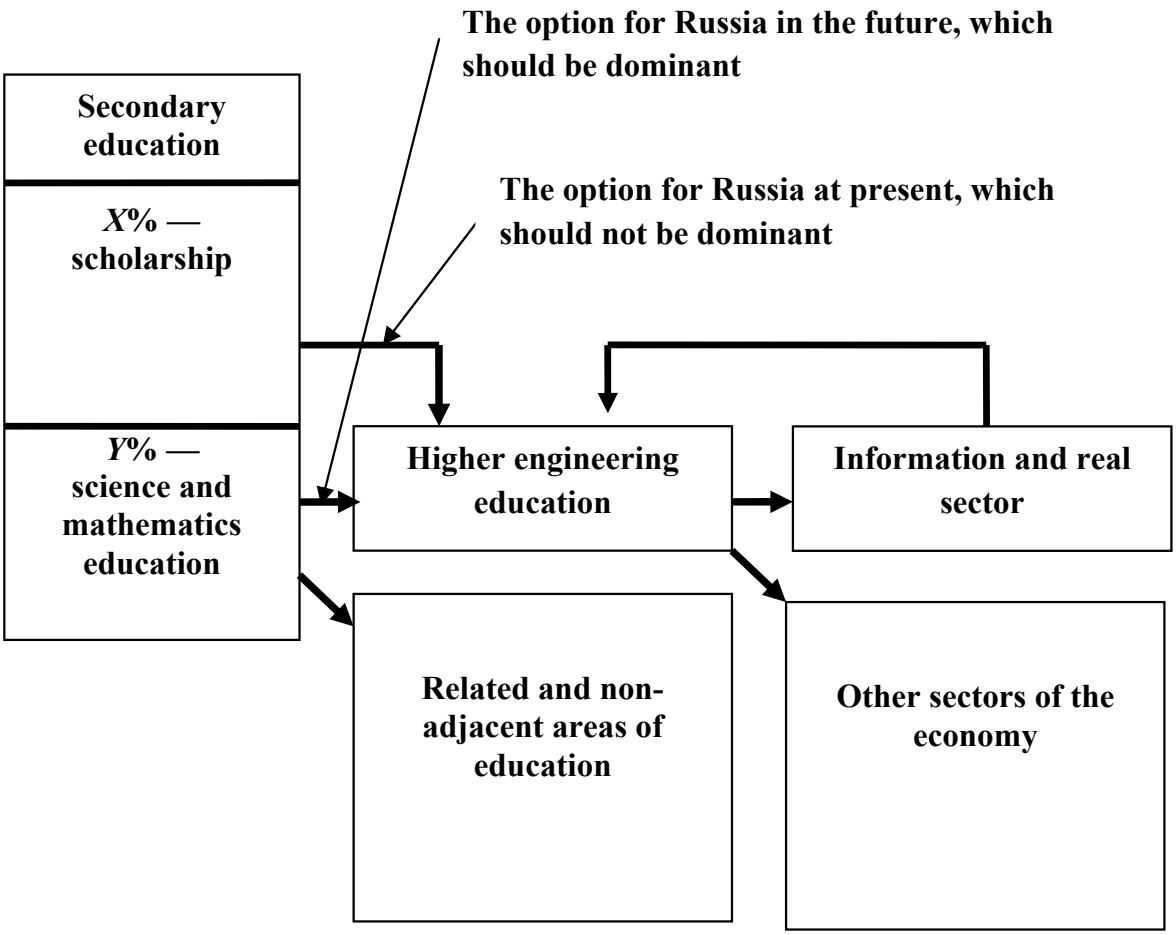

Fig. 2. **The model of formation of the "engineer of the future"**

Source: developed by the authors.

tor as the proportion of personnel engaged in research and development in the number of economically active population. We revealed an increase in the influence of this factor on gross regional product [9]. In this regard, it is necessary to model the priority for the technical or engineering education system and "nurturing the engineer of the future" at the state level (*Fig. 2*).

In this model (see *Fig. 2*), the focus is on the following main points. First, in the secondary education system, students show different abilities or tendencies in the humanities or exact sciences. However, it is also necessary to create the environment for the future scientific and technical education already in school, due to a very distant ambitious aim to obtain (the education or even training) an "engineer of the future". Developing this environment is that as many students as possible gain real knowledge (the knowledge, not the notorious competencies) in mathematics, physics, chemistry. It is even necessary to determine the percentage of students who should increase their intellectual potential in these scientific fields. Such an environment requires financial resources.

Second, all students with a penchant for exact sciences should definitely get a qualitative higher technical (engineering) education. It is only they who can become the "engineer of the future", an engineer with good school knowledge in the exact sciences, and after the graduation — with mathematical and technical thinking. This type of thinking is demanded by the digital economy (for building, not for managing!). It is formed by small increments; it matures in the result

of qualitative continuous education. Today, for various reasons, individual disciplines in schools are taught at a very low level (for example, physics), so that almost no one passes the exams. As a result, in universities, even state-financed openings in departments that train staff for the digital economy do not have enough applicants.

The nexus between secondary education and higher specialized engineering education is probably the most important. Unfortunately, the prestige of engineering education in Russia (which was in Soviet times!) was lost and the real sector was destructed during the reforms of the 90s and then recovered painfully. Therefore, many students with substantial potential in mathematics, physics, chemistry, are choosing the related fields of education, as well as those completely unrelated to the exact sciences.

Moreover, engineering openings are filled as a residual. First, applicants fill prestigious economic and legal state-financed openings, and the rest apply for engineering openings. These schoolchildren do not have basic solid knowledge in the exact sciences, nor a specific way of thinking. Even the most remarkable teachers are unable to increase their potential to the required level (an individual approach is also impossible due to the limited funding of higher education). Therefore, such scholars will not become "engineers of the future". These are opportunity costs of the digital economy.

Third, we are talking about the digital economy, when Russia should not become a consumer of innovative products and technologies, but a producer. Therefore, we should answer the following questions: what is needed and what knowledge is needed to prepare a "producer" of goods and technologies of the digital economy (big data, neurotechnologies and artificial intelligence, distributed ledger systems, quantum technologies, new manufacturing technologies, industrial Internet, robotics and sensor components, wireless technologies, virtual technologies and augmented reality[7]) technology or the fourth industrial revolution. (According to the classification by C. Schwab [5], digital technologies are: new computing technologies, blockchain and distributed registry technologies, the Internet of things. Transformation of the physical world: artificial intelligence and robots, advanced materials, additive manufacturing and multidimensional printing. Human "transformation": biotechnology, neurotechnology, virtual and augmented reality. Integration of the environment: receiving, accumulating and transmitting energy, geoengineering, space technology). Each technology needs a rigid system of knowledge in higher mathematics, physics, and software technology (based mainly on mathematical thinking).

— Due to certain personnel demands, an appropriate state policy is required, aiming at increasing the prestige of an engineer in society. The importance of social prestige (as informal institutions) should be supplemented by economic factors [19]. Today, the prestige of professions in Russia is determined by the "Russian dream of becoming a top manager", since they suggest the highest salaries. Their extra-profits could somehow be justified if Russian top managers were not involved in large monopolies pumping out natural rents, but, in fact, developed the real and information sector. In this regard, the vision of the digital economy is indicative: for young specialists under 35 years old it is "leadership, innovation", for mature specialists over 36 years old — it is "automation, production, technology, design, unified databases" [4, p. 15]. Mature specialists still see the essence of the digital economy, while young people (new-style managers) may not see anything behind the leadership slogan. Business models are just an add-on that cannot exist without a basis, real digital property.

— In the real sector, one should rely on the innovative companies (already operating

[7] The program "Digital Economy of the Russian Federation" was approved by order of the Government of the Russian Federation of July 28, 2017 No. 1632-r. URL: http://www.consultant.ru (accessed on 01.06.2019).

and producing in the digital economy) that proved their commercial effectiveness. It is necessary to provide them with active state support in the form of tax benefits (they exist, but should be expanded), lowered (minimum or zero) interest rates on loans (O. S. Sukharev provided the mathematical justification [20]), grants, etc.

— A simple financial investment in "innovative" state-owned corporations is inefficient. Therefore, we do not need just innovative centers, but "innovative responsibility centers", with a specific manager responsible for the result in the form of a ready-made and popular, mass innovative (high-tech or software) product on the market. Responsibility centers are one of the elements of the responsibility institution for state managers that should be built. Behind every project and corporation, both unsuccessful and successful, are specific public sector managers who failed or coped with the national aims and objectives.

— Since the digital property of leading manufacturers is large, Russia should prioritize the construction of a producing digital economy that will achieve global leadership in selected areas. An analysis of the critical points of bifurcations, an analysis of competitive advantages, considering the accumulated scientific human and technological potential, are required. After all, there is a turning point for Russia, when the leading countries, having received alternative energy production technologies, will abandon Russian oil and gas, so it makes sense to be the first to receive these technologies. However, we should intensify our efforts in working with leading scientists and engineers.

— "Dos moipu sto, kai tan gan kinaso (give me a foothold and I will turn the Earth): give us specialists and responsible managers and we will build a digital economy," — these words by Archimedes were rephrased to emphasize the importance of intellectual capital for the digital economy. Russia should solve the problem of attracting leading engineers as soon as possible — possibly as owners in new digital industries.

CONCLUSIONS

The study offers the following main conclusions. The analysis of the new integrated environment for the development of economic relations is predetermined by many factors of socio-economic dynamics and the development of institutions, but the technology of the digital economy and the fourth wave (and new waves) of the industrial revolution become the driver. This problem must be solved at the national and global levels, as well as at the micro level. Unfortunately, Russia does not act as a manufacturer of high information technologies, but only as a consumer. Therefore, at the level of world exchange, Russia has to give up its natural resources in exchange for high-tech products, based on the most important factor in the development of the economy — human capital (in the new waves of the industrial revolution — intellectual capital). A vicious circle may appear if the human intellect of Russia is depleted due to the fact that it was removed from high-tech reproductive processes (these reproductive processes affect not only the economy, but also the education). Leading countries will strive to maintain systemic leadership in the new waves of industrial revolutions. Despite the negative externalities of the digital economy, the importance of this new factor of production can hardly be overestimated, and Russia should undoubtedly increase its participation in this process to improve the competitiveness, the quality of life of citizens (including the quality of educational and intellectual capital), and economic growth and ensuring national sovereignty. In this regard, we justified the need in Russia to move from the paradigm of consumption of products and technologies of the digital economy that have foreign jurisdiction to the paradigm of production of our own innovative products that meet new technological patterns and are able to compete or stay ahead of the competition on the world market.

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Grabova O. N. — theoretical and methodological justification of the dynamics of digital property, general conclusions and recommendations on the development of the digital economy in the Russian Federation.
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