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Assessing the Readiness of Russian Industrial Enterprises for Digital Integration in the New Economic Conditions

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ABSTRACT

Integration processes ensure the progressive growth of the national economy, especially reckoning the factors of the crisis and the imbalance of the socio-economic environment in different forms of manifestation, including those caused by sanctions restrictions. The actualization of the problem of assessing digital integration at the level of the sectoral economy is due to the lack of comprehensive analytical methods that allow to identify the prerequisites and prospects for the digital integration of Russian industrial enterprises, considering various factors of the internal and external environment. The study's aim is to generalize related approaches and tools for analyzing the digital transformation of industrial enterprises and to develop a methodological approach to assessing the readiness of Russian industrial enterprises for digital integration. The study is based on an interdisciplinary approach, since digital integration relations cover a wide range of tasks, the solution of which involves the use of systemic, factorial, statistical, evidence-based, comparative and expert methods, as well as grouping and clustering. These methods make it possible to identify specific features of the assessment of digital integration in the industry. The information base for the assessment is the officially submitted data from the Russian system of statistical observation, as well as samples of approved target indicators of Russian strategic planning documents in digitalization and ensuring the sustainability of industrial enterprises. Based on the generalization of foreign and domestic experience, the authors have identified the parameters that were a subject to evaluation in terms of digital integration of industry complexes, groups of enterprises and legal entities. Systematization of scientific approaches to the research of digital aspects of industrial facilities proposed by domestic and foreign scientists. This allowed the authors to determine the basic conditions and factors that were the main ones for assessing the readiness of Russian industrial enterprises to the digital integration. In addition, the authors proposed evaluation indicators with the possibility of visualizing the results obtained for making further management decisions. The assessment results can be incorporated into making strategic decisions aimed at involving IT business entities, development institutions and industrial enterprises in digital integration. Considering the results obtained from the position of the authors, it makes sense to strengthen the functional and regulatory impact on large regional manufacturing enterprises with a high potential for digital integration.

Keywords: digital integration; industries; Russian industry; assessment indicators; digital integration factors

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INTRODUCTION

The evidence-based approach is becoming very popular in various fields of scientific and applied knowledge but is especially important for making medium and long-term decisions. The digital integration of industrial enterprises has a strategic vector; therefore it requires reasonable and balanced decisions based on qualitative and quantitative information [1, 2].

In the field of digitalization, as a rule, structures and processes are evaluated; Data management; quality of goods, works, services; innovative activity; external environment and its impact on the internal environment; financing; infrastructure and data security; ethical attitude to digital technologies [3–5]. The assessment involves the use of such parameters as: 1) digital coverage of different user groups, including individuals and legal entities, with an increase in the level of digital culture; 2) involvement in the creation of new digital business models and cross-logistics chains for the movement of goods; 3) the scale of introduction in the industrial sector and NPOs of advanced digital technologies (including end-to-end and additive), the industrial Internet of

things, artificial intelligence and distributed registry systems; 4) ways and barriers to use advanced IT technologies at industrial facilities; 5) distribution of digital platforms, new online services in the interaction and integration of business entities; 6) development of digital channels of corporate mobility; 7) development of the data industry, their processing, accumulation and distribution for business purposes, including digital analytical consulting; 8) development of new products based on client-centric and flexible approaches using design thinking and agile [6]. In fact, we are talking about creating open industries by analogy with open (cloud) organizations [8–10].

Organizations will be ready to transform into a digital enterprise only when they have: 1) operational resilience (a stable operating base); 2) organizational flexibility (quickly adapt to changes); 3) strategic flexibility (will be able to anticipate changes); 4) "disruptive" culture (receptive to the introduction of digital changes).[1] Accordingly, in order to successfully transform into a digital enterprise, an organization must demonstrate its readiness in the above four dimensions.

INSTITUTIONALIZATION OF THE FORMATION OF THE DIGITAL SPACE OF INDUSTRY

The specifics of the implementation of the digital transformation program in the industry is considered to be the broad support from the federal and regional budgets. Such a mechanism contributes to the faster introduction of advanced IT technologies into production and creates conditions for the formation of a digital industry space [10]. The basic projects of the ecosystem (digital space) are aimed at digital provision, first of all, of the high-tech manufacturing industry with an increase in the share of "smart" industries, as well as at maintaining national technological sovereignty in general. Through the introduction of "smart production" technologies based on Russian software, a significant increase in labor productivity and the expansion of technological, production and marketing capabilities of industrial enterprises are planned, which is extremely important for effective integration.

The creation of a new employment model through the digital transformation of production was considered as part of the implementation of the national project "Improving labor productivity and supporting employment", which started in Russia in 2018. Since 2021, the tasks of the national project have been expanded, and it has become focused on implementation at industrial enterprises of online-services of the digital ecosystem with an increase in the share of digital tools. Organizations participating in the national project to increase labor productivity through the digital ecosystem can be included in the national project at any stage of the life cycle, including at the stages of optimizing current activities and business processes. Adaptation of services to the existing production system and individual configuration of tools to support the improvement of production processes are provided, including through the national project. The goal of the digital ecosystem of the national project to increase labor productivity until 2025 is to join the national project for more than five thousand organizations, both SMEs and large ones. It is expected that participating companies will be able to implement new and better digital solutions, as well as provide significant productivity gains. At the current stage, many domestic companies (with the exception of large and technological ones) have not yet implemented ubiquitous digitized production processes, which does not allow them to fully ensure intensive growth rates of labor productivity.

A separate area in the designated national project is the development of the principles and competencies of lean production, the formation of the ethics of thrift at enterprises

[1] Assessing Readiness to be a Digital Enterprise — Part One. URL: https://www.institutefordigitaltransformation.org/assessing-readiness-to-be-a-digital-enterprise-part-one/

participating in the national project. Companies that are leaders in industrial digitalization increase labor productivity by about three times. As artificial intelligence technologies are introduced, the effect of the digitalization of industries will grow. The potential opportunities of digitalization make it possible to reduce the costs of information-intensive processes by 80–90%, and to reduce the execution time by several times. In addition, it contributes to ensuring the transparency of the activities of enterprises and organizations.

Digitalization has a significant impact on the entire operating environment and the internal functioning of companies, provides additional business opportunities in existing and new areas, including integration with other market entities. More and more companies are looking to benefit from digitalization, but at the same time, there are many challenges in digital transformation and digital integration. Automation systems throughout the life cycle require updating and improvement, including the introduction of digital technologies, which implies additional resource costs for the creation of digital ecosystems.

The digital space of industry is understood from the position of open ecosystems of an innovative type. For domestic companies, this is an opportunity to integrate into the digital market, to intensify the development of Russian software products, applications, services, and advanced digital tools (for example, artificial intelligence systems),[2] that they can offer to industrial companies and other interested parties [11].

METHODOLOGICAL BASIS AND THE PARAMETERS FOR ASSESSING THE DIGITAL INTEGRATION OF INDUSTRIAL ENTERPRISES

Systematizing some foreign and domestic studies [12–18], developing the conceptual approach of a single digital space and adapting it to the industrial sector of Russia, we note that when developing a methodological basis for assessing the readiness of Russian industrial enterprises for digital integration, it is necessary to take into account the following features:

1) the degree of industrial connectivity of industrial enterprises (industrial center, cluster, core, role in the chain of the reproduction process);

2) territorial affiliation of industrial enterprises;

3) the level of integration of ICT (Information and Communication Technologies) into business processes and the digitalization of the production of industrial enterprises (new business models in industry, the creation of digital business models);

4) the role of industrial enterprises in creating added value or in increasing the return on innovation (the result of intellectual activity with the potential for commercialization, the creation of intellectual property objects and the possibility of registering rights, the introduction of Industry 4.0 technologies and artificial intelligence systems in industrial enterprises);

5) the availability of working capital for the implementation of digital innovation projects of industrial enterprises and the development of the institutional environment of the digital economy [financial institutions, development institutions, business environment, participation in national projects (including "Increasing labor productivity")];

6) risk-based tools for digital integration of industrial enterprises, including data protection and cybersecurity.

Based on the identified features, we single out *the six main factors* with the greatest impact on the digital integration of Russian industrial enterprises:

1. Cooperation links and clustering.
2. Spatial localization.
3. Industry digital readiness and lean manufacturing.

[2] The "4.0 RU" program has been launched in Russia. URL: https://plastinfo.ru/information/news/34067_14.07.2017/

4. The knowledge economy in the industry.

5. Sources of financing for the digital integration of industrial enterprises.

6. Risk management of digital integration.

Each factor is evaluated by a set of indicators formed on the basis of official statistics and proposed calculation data. The result is an aggregated valuation model that takes into account all six factors.

To form a set of indicators, official information materials were used, including presidential decrees on the national development goals of Russia in the period 2017–2030; national projects; state and departmental programs of the Russian Federation in the field of scientific and technological development for a long-term period, in the field of economic innovative development and increasing the competitiveness of Russian industry; on the issues of ensuring economic and environmental security, as well as the digital transformation of industries and the national economy. Special attention is paid to the analysis of passports of national projects of labor productivity and employment support, SMEs and initiatives in entrepreneurship, analysis of strategic infrastructure projects of federal significance. The study summarized the operational information of ministries and departments on the current social and economic situation, in particular, the Ministry of Economic Development of Russia, the Ministry of Industry and Trade of Russia; forecast data and scenario parameters of socio-economic development for the period 2022–2025, including taking into account anti-crisis and anti-sanction measures. In addition, official statistical indicators were used, in particular, operational information on the development of national SDG indicators[3] and the technological development of the Russian economy, statistical information related to science, innovation and technology,[4] as well as monitoring of the development of the information society.[5] Other sources and reviews are also summarized [19].

The following set of indicators is proposed to assess the pronouncement of each of the six factors above in the industry.

I. *Cooperation links and clustering.*

1.1. The share of industrial organizations (of the total number) using cloud services and broadband Internet access systems, in %.

1.2. Number of organizations, ICT sector, in units.

1.3. Personal (individual) production of industrial organizations that are members of innovative territorial clusters (dynamics compared to the base and the previous year).

1.4. Investment expenditures of organizations in the fixed capital of ICT, including equipment, intellectual property objects, buildings (structures), including, based on their investment structure, in %.

1.5. Business activity of ICT organizations, in %.

1.6. Business activity of industrial enterprises, in %.

1.7. Share of e-procurement of the industry sector, in %.

1.8. Number of industrial clusters, in units.

1.9. Number of electronic platforms (marketplaces), in units.

1.10. The number of industrial enterprises included in the Russian rating of high-tech companies (TechUspekh/(TechSuccess), in units.

II. *Spatial localization.*

2.1. Centers of economic growth, in particular the industrial (cluster) core of a subject of the Russian Federation, a macro-region or an agglomeration, which are provided with high-speed transport communications, in %.

[3] Status of development of SDG indicators. URL: https://rosstat.gov.ru/sdg/reporting-status

[4] FSGS. Federal State Statistics Service. Science, innovation, technology. URL: https://rosstat.gov.ru/statistics/science

[5] Monitoring the development of the information society. URL: https://rosstat.gov.ru/statistics/infocommunity

2.2. Transport provision of the constituent entities of the Russian Federation, compared with the base and previous years.

2.3. Number of industrial (sectoral) technology parks, in units.

2.4. The number of socio-economically significant enterprises in the industrial sector, in units.

2.5. Number of high-tech enterprises, in units.

2.6. Number of electronics industry enterprises, in units.

2.7. The share of electronic industry enterprises in high-tech enterprises, in %.

2.8. Number of innovative development institutions (venture companies, development corporations, funds), in units.

2.9. Number of digital industry fairs and exhibitions held, in units per year.

2.10. Number of territorial innovation clusters, in units.

III. *Industry digital readiness and lean manufacturing.*

3.1. Gross value added of ICT economic entities, in % of GDP;% to GRP (for subjects of the Russian Federation).

3.2. The share of goods (R / C) with an innovative component of industrial enterprises from shipped, in %.

3.3. Introduction of modern digital and automated industrial production technologies, in units (quantity).

3.4. The share of engineers in the industrial sector who intensively use digital technologies, in % of the total number of engineers.

3.5. The share of specialists in the industrial sector by databases and networks, in % of the total number of engineers.

3.6. Organizations implementing innovations in technologies and technological processes, in % of all organizations and in % of industrial organizations.

3.7. Dynamics of labor productivity growth for enterprises participating in regional projects and programs, including through regional centers of competence (RCC).

3.8. The share of high-performance jobs in production areas, in %.

3.9. The share of enterprises implementing State ISO standards in the industrial sector, in %.

3.10. Return on assets of industrial enterprises, based on net profit.

IV. *The knowledge economy in the industry.*

4.1. The volume of internal costs for R&D in the field of digitalization, in % of the total costs for R&D.

4.2. The volume of domestic costs for digitalization, digital integration and digital services, in % of GRP — by constituent entities of the Russian Federation, in % of GDP.

4.3. Share of applications for patents of digital technologies (total) and digital technologies in industry (Industry 4.0., industrial property applications), in % of all applications filed with Rospatent.

4.4. Share of patents on ICT objects registered with the national patent office, in % of the total number of registered patents.

4.5. Dynamics of internal costs of industrial enterprises for digitalization, including the creation and implementation of ICT technologies, in % of total costs, growth rate in relation to the previous and base years.

4.6. Development of production software by domestic ICT companies, in units (quantity).

4.7. The share of products (works/services) with an innovative (technological) component, in % of all shipped products provided by R/S.

4.8. Educating specialists, bachelors and masters in professions and qualifications in the field of ICT and digital production, in % of all vocational and higher education graduates in the system, including the regional component.

4.9. The share of industrial enterprises included in the rating of the most innovative companies (according to RAEX), in %.

4.10. The level of innovative activity of industrial enterprises, dynamics compared to the base and previous year.

V. *Sources of financing for the digital integration of industrial enterprises.*

5.1. Growth of investments (investment activity) in the fixed capital of industrial enterprises through the use of digital technologies, in % of the base and previous year.

5.2. Growth of investments and budget financing of companies — domestic software developers, in % of the base and previous year.

5.3. The share of internal gross costs of industrial organizations for the development of the digital economy by type, in %.

5.4. Internal costs of enterprises and industrial organizations for the digitalization of business processes, including the acquisition and integration (adaptation, refinement) of digital technologies; provision of telecommunications, digital content, software purchase, staff development in digital competencies and ICT implementation, in % of total costs.

5.5. The share of external costs in the use and implementation of digital technologies, in % of total costs.

5.6. Structure of investments (according to sources of financing) of the ICT sector: own funds; attracted funds, in billion rubles.

5.7. The share of internal financing of technological innovations of organizations in the industrial sector, in % of total costs.

5.8. Net profit of industrial enterprises, in billion rubles.

5.9. The share of costs for the development of general digital competencies of personnel, in % of total costs.

5.10. Share of costs for the development of special digital competencies (Industry 4.0), in % of total costs.

VI. *Managing the risks of digital integration in the industry*

6.1. The number of critical information infrastructure objects, in units.

6.2. The number of errors and failures of technical support in the industrial sector, in units.

6.3. The share of errors and failures of the ICT infrastructure in all equipment failures, in %.

6.4. The number of virus infections and hacker attacks on web services, in units.

6.5. Number of digital logistics systems, in units.

6.6. Share of errors of non-professional use of ICT infrastructure in the industry, in % of total errors.

6.7. Share of biometric access to the IT system, in % of total access.

6.8. The share of artificial intelligence technologies in the industrial sector, in % of total technologies, in % of all digital technologies used.

6.9. The number of data centers for aggregation and processing of information, in units.

6.10. The share of organizations using special software, in %.

We also note that digital integration in industry covers three blocks at the level of industrial enterprises: organizational management, business goals, technology, which is reflected in our approach.

Due to the different dimensions of the generated indicators, it is proposed to use the scoring method at the second stage (for aggregation and generalization), and at the third stage, the construction of a "radar" diagram. The maximum value is 180 points (6 groups of 10 indicators, each of which is ranked according to the values "high-medium-low-absent" with assignment of 3, 2, 1 and 0 points, respectively).

PARTICIPATION OF THE EXPERT COMMUNITY IN THE ASSESSMENT OF DIGITAL INTEGRATION IN THE INDUSTRY

Experts are qualified specialists in a specific professional field, have pronounced cognitive competencies that allow them to formulate sound conclusions on any issues.

In order to improve the efficiency of assessing the readiness of Russian industrial enterprises for digital integration, a set of requirements for experts is proposed. Taking into account the importance of the assessment tasks, as well as the subsequent interpretation of the results for decision-making, we believe it is appropriate to include

CDTO (Chief Digital Transformation Officer) positions in the expert group of specialists (managers). With a comprehensive set of competencies, digital transformation leaders are able to systematically see the potential and risks of digital integration.[6] The role of digital transformation leaders has increased significantly in the past five years, and companies are actively introducing new structural divisions with the appointment of CDTO. The position of CDTO as creators of synergy is especially effective in the context of large and medium-sized industrial companies.

Functionally, digital transformation leaders are responsible for issues related to the development of a digital strategy and control of its implementation through general as well as special (budgeting, formation of digital environments, harmonization of corporate data automation processes, design of digital products and services) management techniques. In addition, an important task of the CDTO is to create a corporate center of competence, since there is often resistance from employees of enterprises to digital changes, covering almost all areas of corporate activity — from industrial processes to external communications. Moreover, it should be borne in mind that digital transformation applies to the entire management system.

In the case of active support at the senior management level of the head of digital transformation with the assignment of responsibility for mobilizing organizational resources (including networks and communications), CDTO can effectively implement fundamental transformational changes to introduce advanced digital technologies into the business processes of industrial enterprises. The requirements for CDTO include the following competencies and skills: customer centricity, communication, emotional intelligence, result orientation, creativity, criticality, management tools and organizational culture, knowledge of digital technologies, data analysis, IT infrastructure. CDTOs are usually experienced experts and professionals who understand the prospects and trends of ICT development, many of them have promoted and invested in technology projects (start-ups).

The intensity of the introduction of digital technologies determines the complexity of digital transformation processes, which is emphasized not only by practitioners, but also by the scientific community. In companies that widely use digital technologies, it is necessary to create an appropriate operating environment [20].

In our opinion, as an additional requirement for experts, knowledge in the field of industrial safety and digitalization of industry should be included. If we consider general analytical skills, then they include: logical and critical thinking, strategic vision, skills of static and comparative generalization, mathematical and simulation modeling, and the ability to analyze heterogeneous data. Based on a set of competencies, it is advisable to form an expert group (team) with an odd number of participants — a similar principle of creating teams is used in cases where decisions are made collectively.

CONCLUSIONS

Considering the above-mentioned information, we should note that the formation and development of the digital space of industry involves the active participation of all the interested parties — starting from the state and ending up with the direct participants in integration relations. Russian industrial enterprises are generally ready to switch to digital production if optimal institutional and technological conditions are created. At the same time, due to the heterogeneity of the economic and technological potential of industrial

[6] Requirements for the level of competence of the role of "CDTO — the head of digital transformation" in the public administration system. URL: https://hr.cdto.ranepa.ru/att-3

enterprises, the digital environment in them differs significantly. Effective digital integration is possible within open ecosystems that include industrial enterprises, ICT organizations, institutions for the development of the digital economy and digital markets.

Assessing the digital integration of industrial enterprises is an understudied area of research. The evaluation parameters may vary depending on the goal and focus on a comprehensive or local nature.

The proposed methodological approach makes it possible to conduct a comprehensive assessment of the readiness of Russian industrial enterprises for digital integration, to identify the potential opportunities for territories (subjects of the Russian Federation) to create ecosystems with the inclusion of the industrial sector in them, which will contribute to faster digital transformation and increase the added value and competitiveness of manufactured products of industrial enterprises.

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REFERENCES

1. Kane G.C., Palmer D., Phillips A.N., Kiron D., Buckley N. Strategy, not technology, drives digital transformation: Becoming a digitally mature enterprise. Cambridge, MA: MIT; 2015. 29 p. URL: https://www2.deloitte.com/content/dam/Deloitte/fr/Documents/strategy/dup_strategy-not-technology-drives-digital-transformation.pdf
2. Reis J., Amorim M., Melão N., Matos P. Digital transformation: A literature review and guidelines for future research. In: Rocha Á., Adeli H., Reis L.P., Costanzo S., eds. Trends and advances in information systems and technologies (WorldCIST'18). Cham: Springer-Verlag; 2018:411–421. (Advances in Intelligent Systems and Computing. Vol. 745). DOI: 10.1007/978–3–319–77703–0_41
3. Parviainen P., Kääriäinen J., Tihinen M., Teppola S. Tackling the digitalization challenge: How to benefit from digitalization in practice. *International Journal of Information Systems and Project Management*. 2017;5(1):63–77. DOI: 10.12821/ijispm050104
4. Gokhberg L.M., Rudnik P.B., Vishnevskii K.O., Zinin T.S., edited. Digital transformation of industries: Starting conditions and priorities. Report of the NRU HSE. Moscow: HSE Publishing house; 2021. 239 p. (In Russ.).
5. Beniamin G., Lavandier H., Muthiah S. The service solution for unlocking industry's next growth opportunity. McKinsey & Company. Jan. 31, 2019. URL: https://www.mckinsey.com/capabilities/operations/our-insights/the-services-solution-for-unlocking-industrys-next-growth-opportunity
6. Lola I.S., Bakeev M. Measurement of digital activity in medium, high-tech and low-tech manufacturing industries. Basic Research Program Working Papers. Series: Science, Technology and Innovation. 2019;(95). URL: https://www.hse.ru/data/2019/08/08/1483633828/95STI2019.pdf
7. Blommaert T., Van den Broek S. Management in singularity: From linear to exponential management. 1st ed. Deventer: Vakmedianet; 2017. 172 p.
8. Ardolino M., Rappaccini M., Saccani N. et al. The role of digital technologies for the service transformation of industrial companies. *International Journal of Production Research*. 2018;56(6):2116–2132. DOI: 10.1080/00207543.2017.1324224
9. Teichert R. Digital transformation maturity: A systematic review of literature. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*. 2019;67(6):1673–1687. DOI: 10.11118/actaun201967061673
10. Zhishkevich S. The fourth industrial revolution in Russia: Main achievements. *Tsifrovoe proizvodstvo: segodnya i zavtra rossiiskoi promyshlennosti = Digital production: today and tomorrow of the Russian industry*. 2017;(1):75–90. URL: https://borlas.ru/sites/default/files/pdf/digital_production2017.pdf (In Russ.).

11. Lee M.-X., Lee Y.-C., Chou C.J. Essential implications of the digital transformation in industry 4.0. *Journal of Scientific and Industrial Research*. 2017;76(8):465–467. URL: http://nopr.niscpr.res.in/bitstream/123456789/42548/1/JSIR%2076%288%29%20465–467.pdf
12. Fedoseev A.V. Integration of industrial enterprises: Research and evaluation of efficiency. Chelyabinsk: South Ural State Humanitarian Pedagogical University; 2018. 160 p. (In Russ.).
13. Veselovskii M. Ya., Khorashavina N.S., edited. Innovative and technological trends in the development of industry in the context of digitalization of the economy. Moscow: Mir nauki = The world of science; 2022. 441 p. URL: https://izd-mn.com/PDF/03MNNPM22.pdf (In Russ.).
14. Sharonov A., ed. Digital production. Methods. Systems. Technology: A report. Moscow: Skolkovo; 2017. 86 p. (In Russ.).
15. Glazkov B., Krasovsky P., Lysenko A., Naumtseva E. Monitoring of global digitalization trends. Moscow: Rostelecom; 2020. 19 p. (In Russ.).
16. Dolganova O.I., Deeva E.A. Company readiness for digital transformations: Problems and diagnostics. *Business Informatics*. 2019;13(2):59–72. DOI: 10.17323/1998–0663.2019.2.59.72 (In Russ.: *Biznes-informatika*. 2019;13(2):59–72. DOI: 10.17323/1998–0663.2019.2.59.72).
17. Lei Z., Jing Y. Study on human resource reform in the digital transformation. In: Proc. 2016 Joint int. information technology, mechanical and electronic engineering (JIMEC 2016). Dordrecht: Atlantis Press; 2016:471–477. (Advances in Engineering Research. Vol. 59). DOI: 10.2991/jimec-16.2016.84
18. Fitzgerald M., Kruschwitz N., Bonnet D., Welch M. Embracing digital technology: A new strategic imperative. MIT Sloan Management Review. Research Report 2013. Cambridge, MA: MIT; 2014. 12 p.
19. Abdrakhmanova G., Vishnevsky K., Gokhberg L., Demidkna O. et al. Digital economy indicators of the Russian Federation 2021: Stat. collections. Moscow: NRU HSE; 2021. 381 p. (In Russ.). DOI: 10.17323/978–5–7598–2385–8
20. Aturin V.V., Moga I.S., Smagulova S.M. Digital transformation management: Scientific approaches and economic policy. *Upravlenets = The Manager*. 2020;11(2):67–76. (In Russ.). DOI: 10.29141/2218–5003–2020–11–2–6

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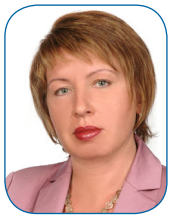

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