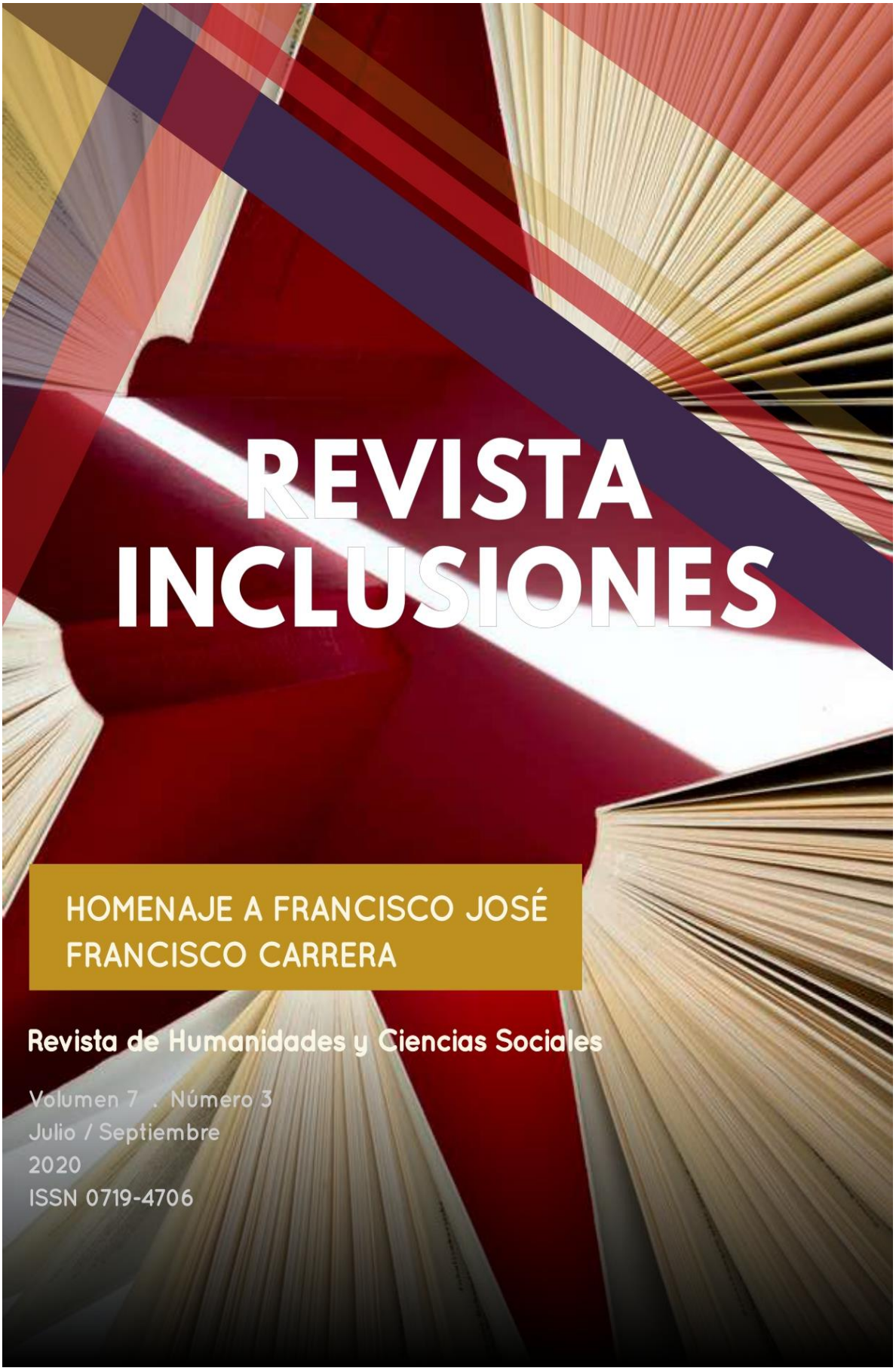
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ENHANCEMENT OF GOVERNMENT INNOVATION POLICY IN DIGITAL TRANSFORMATION OF RUSSIAN COMPANIES

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Abstract

The paper substantiates the problem of speeding up the digital transformation of the Russian economy based on large-scale support from the government. Key determinants in the emergence and advance of the Russian digital economy are identified. Overviews of the Russian Internet economy are provided, based on appraisals by Russian and foreign experts. The main cited problems hindering the development of the digital economy in Russia include: digital inequality of Russian regions, skills shortage in the IT industry, inadequate investment in the digital development of business, inadequate legal framework in electronic commerce and intellectual property protection with regard to digital content. An analysis of Russian business leaders' views regarding the level of maturity of digital development in their companies is offered. Relevant directions of digital project implementation in Russian companies are established. A comparative analysis of digital practices depending on company size and industry is conducted. A direct link is established between the company size and digital activity growth, as well as between digital development directions and the industry. A conclusion is drawn that Russian businesses recognise the need to build business processes powered by digital technology.

Keywords

Digital economy – Digital technology – Innovation development – Industry – Business

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Introduction

In an uncertain environment, amid the widespread development of the digital economy, businesses become very sensitive to the technological and economic wave that poses demands for the commensurate advance of their future development trajectories powered by digital technologies. Success in digital business development in Russia depends on several reasons, which should be all identified and profiled; problems should be detected and methods to address them should be found. Another important objective is the analysis of the institutional environment surrounding the already developing processes of digitalisation in the economy and public governance.

The purpose of this paper is to chart proposals as to enhancing government support of digital development in Russian companies as a factor of advance toward Russia's technological leadership amid the digital transformation of the global society. That primarily requires conducting an analysis of the Russian economy at the stage of digital transformation and comparing expertise to discover what problems exist in this field and to specify whether they are unique for the Russian environment. A key focus was also profiling the opinions of Russian business leaders regarding their companies' competence in addressing digital challenges and the resulting outcomes for them. The acquired empirical base helped to substantiate and update the directions of government support measures in the adoption of modern digital technology in Russian companies.

The relevance of this study reflects the urgent need to ensure accelerated innovation-driven development of the Russian economy and takes on a new meaning in the outburst and large-scale penetration of digital technology across the range of human operation. The scope of current global digital transformations suggests that Russia, as a global leader on the geopolitical map, should assume an equally meaningful leadership in the digital domain.

Methods

The base input for this research comprises aggregate findings of several established approaches proposed by Russian and foreign researchers focusing on the issues of socioeconomic development[1] , innovation activites[2] and digital transformation of businesses in the sixth wave[3].

[1] V. A. Mau, “Natsionalnye tseli i model ekonomicheskogo rosta: novoe v sotsialno-ekonomicheskoi politike Rossii v 2018—2019 gg”, oprosy ekonomiki num 3 (2019): 5-28 y M. Šikýř, Best Practice Approach to Human Resource Management. The 9th International Days of Statistics and Economics. 2015. Available at: https://msed.vse.cz/msed_2015/article/63-Sikyr-Martin-paper.pdf

[2] N. Bloom; J. Van Reenen y H. Williams, “A Toolkit of Policies to Promote Innovation”, Journal of Economic Perspectives Vol: 33 num 3 (2019): 163–184; S. A. Samovoleva, “Absorbtsiya tekhnologicheskikh znanii kak faktor innovatsionnogo razvitiya”, Voprosy Ekonomiko num 11 (2019): 150-158; G. I. Idrisov; V. N. Knyaginin; A. L. Kudrin y E. S. Rozhkova, “New Technological Revolution: Challenges and Opportunities for Russia”, Voprosy Ekonomiki num 4 (2018): 5-25;

[3] V. B. Betelin, “Challenges and Opportunities in Forming a Digital Economy in Russia”, Herald of the Russian Academy of Sciences Vol: 88 num 1 (2018): 1-6; S. Plaksin; G. Abdrakhmanova y G. Kovaleva, “Approaches to Defining and Measuring Russia’s Internet Economy”, Foresight and STI Governance Vol: 11 num 1 (2017): 55–65 y G. Westerman; D. Bonnet y A. McAfee, Leading Digital: Turning Technology into Business Transformation (New York: Harvard Business Review Press, 2014).

To formalise and aggregate the findings, the methods of comparative and abstract logical analysis were used, as well as economic and statistical analysis, expert appraisal, formalisation, induction and deduction methods.

Results

Outlook and challenges of Russia's digital economy: expert appraisals

The processes in the emerging digital economy in Russia have taken the form of a stable trend, with specific characteristics involved and potentially subject to a comprehensive analysis.

In 2019, the economy of the Russian Internet segment totalled 4.7 trillion rubles (up 20% from 2018), while the audience stood at 96.9 million people. The biggest share of the economy was made up by the advertising and marketing category totalling 330 billion rubles, followed by infrastructure (130 billion rubles), digital content (115 billion rubles), electronic commerce (2,850 billion rubles) and payment services (1,350 billion rubles). Internet penetration stood at 78.1% in 2019. The Russian Internet audience rose to 96.9 million people. The mobile audience has traditionally demonstrated growth as well, reaching 85.2 million people in 2019. According to the Russian Association of Electronic Communications (RAEC), the average age of the audience is rising and regional dynamic is outpacing big cities. The share of Internet-related legislative bills receiving positive appraisals also rose in 2019 to 21% (6% above the level of 2018)[4].

The main determinants in the emergence and advance of the Russian digital economy are as follows: development of physical Internet infrastructure and subsequent growth of the user base, development of electronic commerce, the IT industry and national e-government system.

Two methods can be used to analyse the size of the Russian Internet economy, namely, the end-use method and production method[5]. Under the first method, which adds up expenses incurred by households on consumption, gross accumulation, public expenses on information and communication technologies (ICT) and net exports, the share of Russia's Internet economy equals 2.7% of GDP. The production method, limited to operations within the scope of the Russian Classification of Economic Activities, equates the total value added for entities operating online to the difference between the output of goods and services and intermediate consumption by sectors and industries, which measures the size of the Russian Internet economy at 2.6% of GDP.

A somewhat lower estimate for the share of Russia's Internet economy, 2.4% of GDP, is proposed by the international consultancy BCG[6], calculated under a method similar to the end-use method. The main challenges facing the emerging digital economy in Russia, according to BCG analysts, are as follows: 1) digital inequality of Russian regions, deteriorating the level playing field in terms of Internet access across the country's

[4] RAEC, Runet Performance in 2019. 2019. Available at: https://techfusion.ru/ekonomiku-runeta-v-2019-godu-otsenili-v-4-7-trln-rublej/

[5] S. Plaksin; G. Abdrakhmanova y G. Kovaleva, “Approaches to Defining and Measuring Russia’s Internet Economy”, Foresight and STI Governance Vol: 11 num 1 (2017): 55–65.

[6] BCG, The Internet Economy in the G-20. Boston: The Boston Consulting Group. 2012. Available at: https://www.bcg.com/documents/file100409.pdf

vast geography and, as a result, lower user activity in the Web; 2) low private sector investment in the development of Internet-powered business models; 3) inadequate government investment in the development of the Internet and access; 4) low localisation levels in ICT products hindering growth in net exports via the Internet; 5) inadequate regulatory framework for consumer right protection in electronic commerce, development of infrastructure for digital trust and intellectual property protection in digital content.

The RAEC's method of adding up the size of the content and service markets provides an estimate of the Runet economy size at 2.4% of GDP[7]. In their analysis, RAEC experts indicated both positive shifts in the development of the Internet economy and the existing challenges as well. The positives include intensified government focus on the enhancement of regulatory framework in the segment with the engagement of all stakeholders in the business community. The cited challenges arresting growth in the Internet economy include the so-called Yarovaya Law, skills shortage in the IT industry, low digital literacy and inadequacy of digital solutions for mobile devices.

RAEC's views are largely echoed in quite similar views of their colleagues from the OECD[8] citing the need for human capital investment, maintaining continued online education for employees and others in general to build digital skills and digital security competence. Moreover, experts from the OECD call for an enhanced system of statistical measures of the digital economy.

Analysts of the international consultancy McKinsey propose the following potential solutions for advancing digital economic development[9]: increasing human capital investment; bringing down the barriers for innovation funding via the Internet; improvement of Internet infrastructure; developing the architectonics of the business environment as an ecosystem of public and private service providers; developing efficient legislation to address a whole range of aspects of the digital economy. The implementation of the above proposals would dramatically raise Russia's attractiveness for foreign investors willing to invest their funds, particularly, in the IT industry. The regulatory process in the digital economy would necessarily involve a constructive dialogue between the public and private sectors active in the national digital markets.

Some more important input comes from the analysts of the international consultancy Deloitte[10] recommending that companies should develop digital ecosystems for their customers through quality improvement at every stage of interaction. The experts' interpretation of the concept of a digital ecosystem goes beyond the development of new digital services and ensuring multi-channel access; they bring in considerations of the basic collaborative principle of a digital ecosystem[11] as a single platform for companies to develop joint products and services bringing additional value for the customers.

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[7] RAEC, Runet economy in 2018. 2018. Available at: http://xn--80aaokjbmheeb2a2al4l.xn--p1ai/

[8] OECD, New Markets and New Jobs in the Digital Economy. 2016. Available at: https://www.oecd.org/internet/ministerial/meeting/New-Markets-and-New-Jobs-discussion-paper.pdf

[9] M. Pélissié du Rausas; J. Manyika; E. Hazan; J. Bughin; M. Chui y R. Said, Sizing the Internet Economy. Internet Matters: The Net's Sweeping Impact on Growth, Jobs and Prosperity (New York: McKinsey Global Institute, 2011).

[10] Deloitte, How to Thrive in the Digital Economy. 2016. Available at: https://deloitte.wsj.com/cio/2016/06/21/how-to-thrive-in-the-digital-economy/

[11] G. Schuh; T. Potente; C. Wesch-Ponte; A. R. Weber y J.-P., "Prote. Collaboration Mechanisms to increase Productivity in the Context of Industrie 4.0", Procedia CIRP Vol: 19 (2014): 51-56.

Appraisal of digital technology integration in Russian business

The level of development of the digital economy in Russia can be practically appraised via a survey of leaders of 100 Russian companies, including 56% small businesses, 19% mid-size businesses and 26% large companies. 53% of the companies represent manufacturing, 18% — the retail sector, 17% — infrastructure, 12% — the banking sector. The respondents were asked to assess the outlook in their company in terms of the scale and depth of digital technology adoption (Digital economy: global trends and Russian business practice, 2017).

The findings showed that a majority of respondents (53%) cited the high degree of digitalisation in their companies and made a point of the mature stage of digital development (Figure 1, A). A somewhat more balanced assessment was given to the development of the industry in general (Figure 1, B).

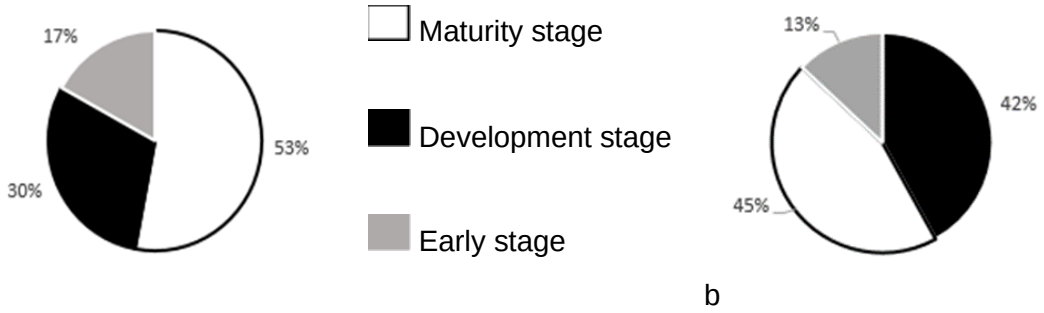

Figure 1
Appraisal of the level of digital maturity for companies
A: respondents' appraisals B: industry-wide measures

There is a quite interesting comparison between these and other findings drawn in a similar study of MIT researchers. A survey of 3,700 business leaders from 131 countries only profiled 26% companies at the maturity stage of digitalisation, with the bigger segment (42%) viewed as matching the development stage and 32% – the early stage[12]. Such a significant difference in responses may suggest Russian business leaders overestimate the level of digital development of their companies.

22% of small business leaders profiled their companies as the early development stage, that is much higher than 12% of mid-size and big businesses. By industry, the early stage of development was cited for 21% manufacturing operations and 18% infrastructure businesses, while the banking sector and exporters came in as the leaders by the use of digital technology, with 50% and 67% respectively matching the maturity stage profile. Among major businesses, the maturity stage was achieved by more than 50%.

Meanwhile, the comparative expert appraisal of the level of digital development achieved by Russian companies versus companies in developed economies favours the latter; the time lag equals 5 years, according to Russian business leaders, or 10 years,

[12] G. P. Li; Y. Hou y A. Wu “Fourth Industrial Revolution: Technological Drivers, Impacts and Coping Methods”, Chinese Geographical Science Vol: 27 num 4 (2017): 626-637.

according to experts. Meanwhile, Russian manufacturing boasts numerous digital solutions to rival foreign technologies.

The priority segment can be identified in an analysis of digital technology application practice, namely, corporate objectives. 92% of business leaders confirm this view and, most of the time, projects relate to the adoption of online document flow systems and management automation (Figure 2).

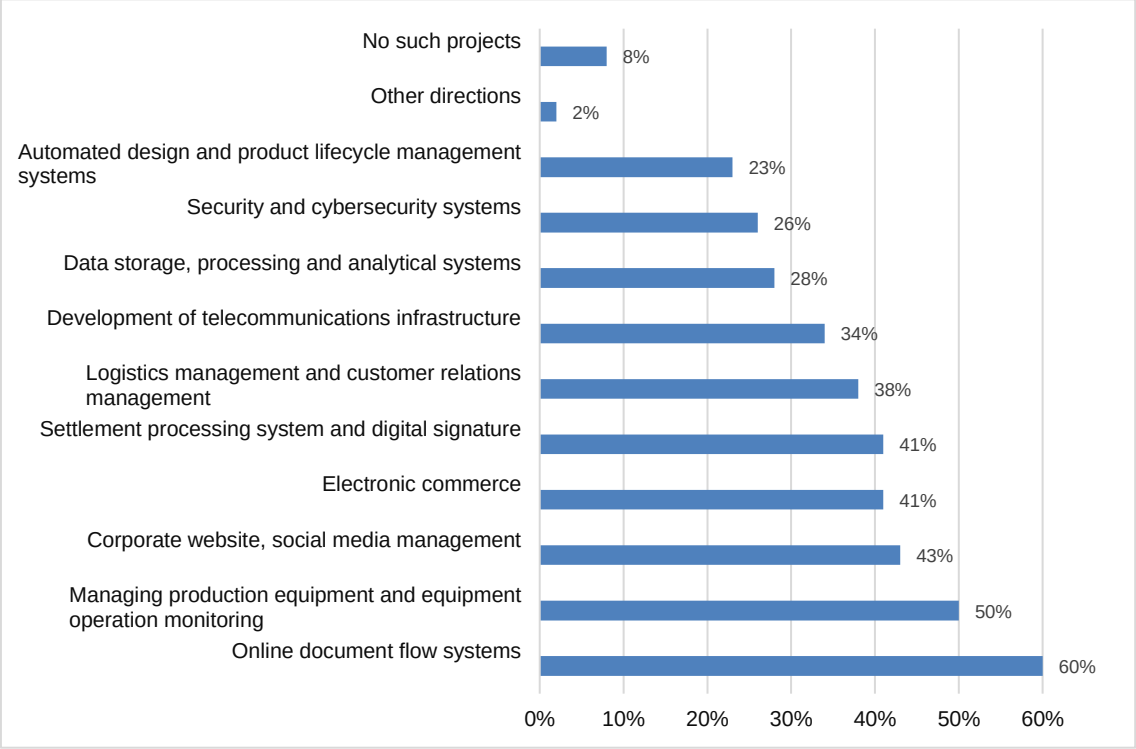

Figure 2
Key directions of digital projects in companies

The highest activity levels in digital project implementation are observed in major businesses and primarily relate to setting up online document flow systems (72%), production equipment management and equipment monitoring (60%), logistics and customer relations management (60%). The rate of digital project implementation in the small and mid-size business segments is no more than 3-4 such projects over the last 3 years, while major businesses implemented on average 5 such projects over the last year. By industry, the maximum activity levels in implementing digital solutions were observed in the infrastructure sector (communications, transportation, energy sector); the banking sector showed the lowest activity.

Apart from the most popular direction of digital project implementation (development of online document flow systems), which is not linked to any particular industry, there are also other rather specialised digital solutions, such as big data storage, processing and analytical systems and online commerce for the retail sector.

Digital projects were mostly initiated by CEOs (42%) and less frequently by CIOs and Technical Services Managers (29% and 19% respectively) (Figure 3).

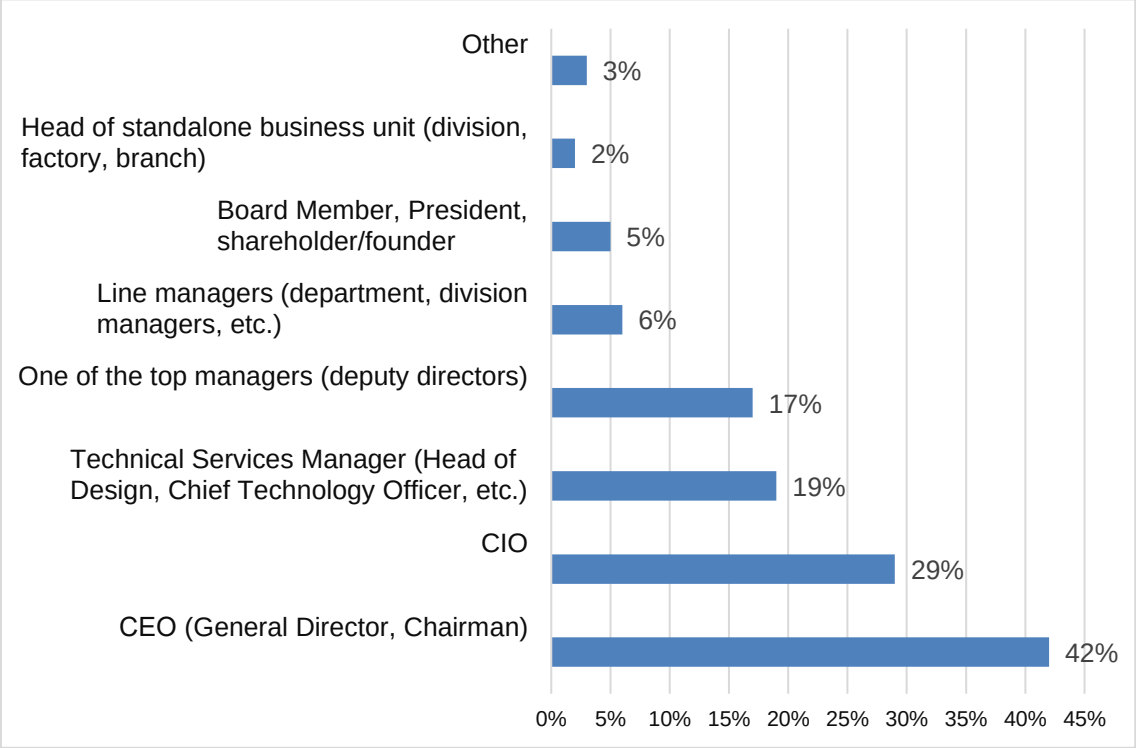

Figure 3
Principal initiators of digital projects

An analysis of satisfaction with digital solutions showed that the effect was in line with expectations for 68% of respondents and exceeded expectations in 13% of cases. In big companies, 86% of implemented projects lived up to expectations, which means company size influences project efficiency; no such link could be identified for the criteria of industry affiliation or digital development level of the company. Main project outcomes in integrating digital technology into business processes are outlined in Figure 4.

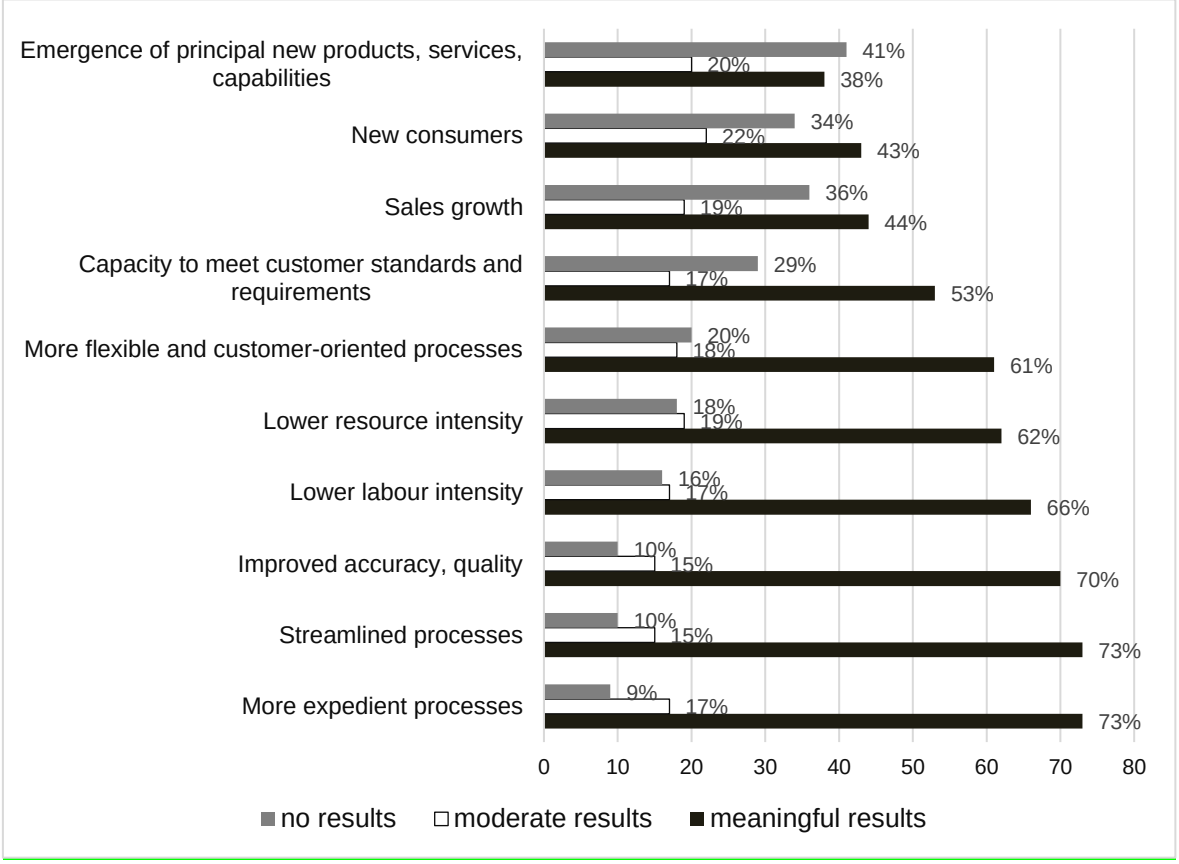

Figure 4
Project outcomes in digital technology implementation

The main meaningful outcomes from digital technology implementation are associated with more expedient and streamlined processes, improved process accuracy and quality and lower labour intensity. Arguably, positive effects can be reinforced by conducting government policies to stimulate digital solutions in the Russian economy.

Directions of government support measures in the adoption of modern digital technology in Russian companies

The ambitious targets of attaining global technological leadership by Russia can be only achieved with government support[13] , which should be implemented across the range.

Primarily, the government should take all steps to encourage competition and create a level playing field. Practice shows the digital economy is progressing simultaneously in multiple directions, therefore, it cannot be developed by a limited number of companies, even if the government provides them with special powers and resources.

[13] Resolution of the Government of the Russian Federation No. 2227-p. Strategy of Innovation Development of the Russian Federation for the period till 2020. December 8, 2011. Available at: https://rg.ru/2012/01/03/innov-razvitie-site-dok.html y Decree of the President of the Russian Federation No. 642. Science and Technology Development Strategy of the Russian Federation. December 1, 2016. Available at: http://kremlin.ru/acts/bank/41449

Based on international practice[14], a key role in the development of the digital economy is played by the private sector showing strong entrepreneurial initiative. Thus, the government's main objective should be the establishment of infrastructure and adequate conditions to stimulate private initiative in digital solutions[15].

The second important direction of government support should be the development of shared technology platforms[16]. Widespread operation of digital technologies becomes feasible given their concerted adoption by a whole group of companies constituting cooperation chains. Lack of such synchronisation is a serious barrier, which may be mitigated by the government acting as an organiser of large consortia or technology platforms to integrate stakeholder organisations or as a regulator enforcing certain set requirements in the use of specific technological solutions (e.g., automated systems in the retail sector, such as the Unified State Automated Information System, the Mercury State Information System, online cash registers). The sweeping process synchronisation in the implementation of typical technological solutions across whole segments of the economy is expected to generate a positive effect in the mid-term and long-term perspective[17].

An analysis of the regulatory mechanism in the digital economy suggests the legal framework should be revised; in particular, a refined concept base of information laws is needed in Russia, with specific considerations for the new objects and subjects of information relations, including specifications of their rights, obligations and responsibility[18]. Moreover, certain legal institutes of the digital economy should be developed and a single digital environment of trust should be built around trusted services (identification and authentification of the interacting parties, protection against unauthorised access to documents, verification of signatories' powers, etc.). Confidentiality, personal data protection, etc. are also important and urgent issues. However, the government should avoid heavy-handed regulatory approaches with such processes. Instead, it should be in a constant dialogue with users, developers, service providers and other stakeholders. The Russian state should uphold its status as a qualified customer. On the one hand, there should be continued efforts to shape significant demand for various products and services powered by digital technology. On the other hand, the government should offer more such services on its own[19]. Making a call for more active digitalisation in its own operation, the government simultaneously stimulates the development of companies in the ICT sector and sets standards in digital technology operation. This inevitably results in the emergence of digital culture for economic agents at large (e.g., the Electronic Russia (e-Russia) programme, acceptance of online tax reports by tax authorities, reliance on plastic cards for social transfers, etc.).

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[14] M. Hermann; T. Pentek y B. Otto, Design Principles for Industrie 4.0 Scenarios. The 49th Hawaii International Conference on System Sciences (2016): 3928-3937.

[15] Tsifra v ekonomike: kak Pravitelstvo provedet tsifrovizatsiyu strany. Available at: https://www.rbc.ru/technology_and_media/28/04/2017/590215859a7947188c8f2bc2

[16] Digital Economy of the Russian Federation. National Programme passport, approved by Resolution of the RF Presidential Council for Strategic Development and National Projects. December 24, 2018. Available at: http://static.government.ru/media/files/urKHm0gTPPnzJlaKw3M5cNLo6gczMkPF.pdf

[17] Tsifrovaya ekonomika: globalnye trendy i praktika rossiiskogo biznesa (Moscow: National Research University Higher School of Economics, 2017).

[18] G. I. Idrisov, V. N. Knyaginin, A. L. Kudrin y E. S. Rozhkova, “New Technological Revolution: Challenges and Opportunities for Russia”, Voprosy Ekonomiki num 4 (2018): 5-25.

[19] V. B. Betelin, “Challenges and Opportunities in Forming a Digital Economy in Russia”, Herald of the Russian Academy of Sciences Vol: 88 num 1 (2018): 1-6.

A special focus relates to government efforts in adopting additional tax stimuli for digital technology development. Cutting insurance contributions is a decent stimulus for IT companies. This relief should be extended. Moreover, the introduction of tax reliefs on capital expenditure on technology modernisation will be of principal importance for boosting investment in digital technology[20]. Another positive impulse for transborder business could arise from tax settlement in online commerce with neighbour states.

There is no widespread and accelerated development of the digital economy without talent training and information efforts (specifically in the media) as a way to spread digital education and prepare of the community for the digital transformation of the living environment and risk mitigation[21]. The government should keep in mind that the digital transformation will inevitably lead to a cardinal shift in the employment structure and will create demand for skills at new levels. Based on labour market foresight and what is currently observed, not only IT professionals and competent users with good working skills in the digital environment will be highly required, but also top managers, "digital leaders", with a vision of how the digital transformation of business processes should be implemented.

The government is responsible for cybersecurity to ensure safe protection and avoid violations of collected, stored and processed digital data. It means the need for legal regulations in place to combat cybercrime. It also means developing technology solutions and standards of information protection, building a cadre of skilled cyberpolice and facilitating their transborder cooperation.

The importance of a steady pipeline of new technological solutions reflects the short time lag between fundamental exploratory research and commercialisation[22]. For the government, this not only sets the requirement for considerable budget support of research projects but also calls for finding efficient mechanisms to engage the private sector in exploratory research. Moreover, measures should be charted to stimulate the development of corporate research, self-sponsored research projects and training of academic management talent with a clear researcher and entrepreneurial stance.

The government should support Russian companies in their expansion into the global market. Some of the potentially instrumental tools include: provision of marketing input to the companies, support of their participation in foreign fairs and events, subsidies and guarantees on export credit, reimbursement of patent expenditure, creation of investment funds with a focus on conducting M&A abroad[23]. All that, alongside the increasing use of digital technology in the production of principal new products and services, will create new opportunities for the rapid growth of IT exports for Russian producers. A case in point is the best practices of Russian companies, including Kaspersky Lab, Yandex, ABBYY, Luxoft, Parallels.

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[20] V. A. Mau, “Natsionalnye tseli i model ekonomicheskogo rosta: novoe v sotsialno-ekonomicheskoi politike Rossii v 2018—2019 gg”, Voprosy ekonomiki num 3 (2019): 5 – 28.

[21] S. A. Samovoleva, “Absorbtsiya tekhnologicheskikh znanii kak faktor innovatsionnogo razvitiya”, Voprosy Ekonomiko num 11 (2019): 150-158.

[22] V. N. Knyaginin, Novaya tekhnologicheskaya revolyutsiya: vyzovy i vozmozhnosti dlya Rossii: expert and analytical report. (Moscow, 2017). Available at: https://www.csr.ru/uploads/2017/10/novaya-tehnologicheskaya-revolutsiya-2017-10-13.pdf

[23] M. Šikýř, Best Practice Approach to Human Resource Management. The 9th International Days of Statistics and Economics. 2015. Available at: https://msed.vse.cz/msed_2015/article/63-Sikyr-Martin-paper.pdf

Finally, an important dimension of the government policy should be comprehensive support of transborder cooperation in modern digital technology development. Indeed, national borders became more transparent with the development of digital technology: talent and teams from different countries work on the implementation of innovation projects, new solutions come on board in an accelerated manner amid the global advance of the competition, which becomes transnational[24]. The government should provide opportunities for Russian users to access to globally available services and conduct the transborder transfer of open data, as well as encourage the participation of Russian companies in global technological alliances shaping technology standards for the future.

Discussion

The emergence of the digital economy is proceeding into an active stage. A clear sign of it is the incorporation of concept papers relating to Industry 4.0 within state programmes and business development programmes and the minimised time lag from theoretical findings and their implementation in new products and services. These trends may signal the beginning of a new technological and economic wave spanning not only research organisations, research and innovation-driven businesses and new economic sectors, but also spreading toward the traditional economic sectors, public institutions and the society in general[25]. While there is no uniform view among researchers and practitioners as to the role of digitalisation for productivity and GDP[26] and the multiplier and cross-industry effects, entrepreneurs and the expert community are already convinced about the imminent and irreversible nature of the market outlook and their heightened responsibilities in the face of digital challenges.

Conclusions

The Russian business community has recognised that the modern competitive mechanism in the Russian and global markets is digital technology. Businesses engaged in the digital race share high opinions of their digital solutions already in operation. However, the digitalisation of business processes is solely pragmatic, as it focuses primarily on those aspects that may be integral and vital to running a business, though without any clear drive to expand into principal new business dimensions. This brings about considerations about the existing challenges in digital technology implementation and actual business practice. Such challenges include: low investment in the implementation of IT projects and maintaining IT operability; skills shortage among IT professionals and insufficient digital competence of users of innovative technology; resorting to traditional methods of operation instead of adopting advanced solutions; insufficient development of infrastructure required to maintain digital communications; inadequate government support in stimulating businesses to more active and large-scale adoption of digital technology. These challenges could be addressed in line with the proposed directions of government support for companies' innovation-driven development powered by digital technology.

[24] N. Bloom; J. Van Reenen y H. Williams, “A Toolkit of Policies to Promote Innovation”, Journal of Economic Perspectives Vol: 33 num 3 (2019): 163–184

[25] M. Hermann, T. Pentek, B. Otto. Design Principles for Industrie 4.0 Scenarios. The 49th Hawaii International Conference on System Sciences (2016): 3928-3937.

[26] G. Westerman; D. Bonnet y A. McAfee, Leading Digital: Turning Technology into Business Transformation (New York: Harvard Business Review Press, 2014).

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