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METHODOLOGICAL TOOLS FOR ANALYSIS, EVALUATION, MODELING AND PREDICTION OF DIGITAL TRANSFORMATION

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Abstract

The world economy is actively implementing innovative activities, which is predicted in the future. Therefore, the importance of forecasting increases. In order to build a methodology for predicting innovative activity in the digital economy, an assessment of the current situation in various fields of activity was carried out. Digital tools have been identified that will be in demand for the development of innovative activities, in particular, the Internet of Things technology and the use of social networks to solve the problems of industrial enterprises. Development of innovative activity, in particular, the Internet of Things technology and the use of social networks to solve the problems of industrial enterprises. By investigating the potential synergies between Internet of Things (IoT) technology and the utilization of social networks and innovative activities, this study provides valuable insights for policymakers, researchers, industry practitioners, and stakeholders seeking to optimize their strategies in the digital economy era.

Keywords: Digital economy, digital transformation, digital technologies, industrial sector, methods of analysis and forecasting, modeling of innovation activity

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1. Introduction

In connection with the monitoring of the macroeconomic and current situation in the industrial sector regarding the innovative component, we propose to introduce the following methodological approach to the analysis and forecasting of innovative activities in the digital economy (Ennen & Richter, 2010): 1) defining the purpose and scientific tasks of analyzing and forecasting innovative activities in the digital economy; 2) development of a system of principles for analyzing and forecasting innovative activities in the digital economy, taking into account the industry factor; 3) substantiation of ways to organize the analysis and forecasting of innovative activities in the digital economy, taking into account the industry factor (development of an appropriate algorithm); 4) study of methodological tools and proposal of an algorithm for choosing specific methods and methods of analysis and forecasting, modeling of innovation activity. The purpose of analysis and forecasting of innovative activity is formulated by us as a study of the features of creating and commercializing innovations in the industrial sector in the digital economy in order to develop information support for innovative activities, which is the basis for making managerial decisions in the context of digital transformation of the industrial sector, determining the optimal parameters and options for innovative activities and evaluating them. influence on the most important indicators of the industry and the state as a whole (Gishkaeva et al., 2021). The implementation of this goal should ensure the creation of favorable conditions for the transition to an effective scenario for the economic development of the industry, region, state, as well as increasing the competitiveness of industrial enterprises in the context of the active transformation of the digital economy. In accordance with the stated goal, the tasks of analyzing and forecasting innovative activities in the digital economy are (Gompers & Lerner, 2001): 1) developing a strategy for the development of innovative activities of the industrial sector with the formation of a mechanism for the rational organization of such activities; 2) creation of a favorable environment for the development of innovative activities of the industrial sector by identifying measures of state support, reducing administrative barriers, improving legal regulation, and stimulating the development of innovative infrastructure; 3) creation of conditions for the development of scientific, technical and intellectual potentials in the digital economy; 4) development of the innovation environment, improvement of the innovation culture and quality of management of the innovation infrastructure of the industrial sector. When analyzing and forecasting innovative activities in the digital economy, taking into account the industry factor, it is necessary to adhere to the following principles (Hayton, 2005): - the principle of legality, publicity and transparency; - the principle of efficiency and reliability of information data; – the principle of applying the dialectical approach to analysis and forecasting; – the principle of business continuity of an economic entity; – the principle of ensuring data comparability; - the principle of quantitative certainty. In the scientific literature on analytical and forecasting activities, it is possible to use other principles that do not contradict the goals and objectives of the methodology for analyzing and forecasting innovative activities in the digital economy, taking into account the industry factor (Hayton, 2005). The method of organizing the analysis and forecasting of innovative activity in the digital economy, taking into account the industry factor, in our opinion, can be represented as the following sequence of actions: Stage 1 is preparatory. The specific goal and objectives of the analysis, forecasting of the innovative activity of industrial

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enterprises in the digital economy are determined, the subjects and objects of analysis and forecasting are identified. Stage 2 - development. A program for analyzing and forecasting the innovative activity of industrial enterprises in the digital economy is being formed, methodological tools are being selected, a system of indicators for analytical research is being made, and responsible persons are being assigned (Saidov & Yalmaev, 2021). Stage 3 - analytical. An assessment of the current situation in the industry is carried out, a selection of information is determined that will be required for analysis and forecasting. Stage 4 is the main one. Information is directly analyzed to solve the set goals and objectives, the results obtained are evaluated, planning, budgeting, forecasts are made. Stage 5 is the final one. Control over the carried out analytical work is carried out, informational and analytical reports, forecasts are prepared. The results of analysis and forecasting of innovative activity in the digital economy, as a rule, form the basis of management decisions aimed at improving the efficiency of innovative activity of industrial enterprises.

2. Problem Statement

Digital transformation in leading countries looks as a foremost trend of great general digitalization, particularly compared with those industries that have already reached an high level database maturity (Henderson & Clark, 1990). Proliferation of new business models based on digital technologies and online platforms is simply the top in iceberg. This result achieved through a long stage of formation information and telecommunication infrastructure, accumulation human resources adaptations regulations etc. The introduction of electronic document management, the creation digital twins and formation a data market are important. Designed work remains far from completed and will continue. Digital transformation were considered in our country only several industries (Dzhemaldinova et al., 2021; Uvarov et al., 2019). That to carry it out without proper preparation is probably most likely cause the work failure. At the beginning of 2021, the President of the Russian Federation instructed key companies to ensure the strategic deployment of digital transformation strategies for the main sectors of the economy and social sphere (Shakhgiraev & Murtazova, 2019). A proposal make it possible to assess the relevant opportunities and prospects for each them, into outline guidelines. We need to understand that, due к extremely uneven level digitalization of industries and other factors these strategies will be ambitious for varying degrees & not all from them also should “fit their headling”. We presume that this will not lead to unjustified disappointment and hasty conclusions, but becomes a difficulty for further digital development of industries. The success of digital transformation industries, is based on the key role corporate sector focusing upon customer needs and market demands (Shakhgiraev & Zubairaev, 2021). This provides us to design strategies cost-effective digital transformation management supplied by consumers.

3. Research Questions

Does state organize relevant change, even through the implementation of demonstration projects but “steps aside” during time while market mechanismy make choices for effective solutions. That same time, practical attempts made in our country to “organize” digital transformation exclusively «without the

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perimeter» of public sector making output on approaches that are rather limited within terms their credits and have largely lost its relevance (Ilyasov, 2018). Digital transformation actually leads down to self copying the state in digital environment. It's hard to count on any significant effects, although some increase in efficiency of solving traditional problems is it. In particular, in the proposals of departments within a line between fields concerned about sectoral digital transformation projects main element is constructed integrated industry platforms which can help implementтировать various information systems that provide collection and processing data for decision-making by relevant authorities but also make profit on design quality things. Understanding platforms have already been created in healthcare (EGISZ), industry (GSP) and energy. Projects are taken for creation a national platform to digital state management of agriculture, and transport complex (Murtazova, 2022). This is normally positive practice dealing with global trends. However, it must be honest to remember that of last 10 or more years numerous information systems (IS) have been constructed on public expense but most them still remain unclaimed. Although some IPs have become very successful and have received back their creation costs many times, however, serious budget funds could not fully make the planned refund. With regard to completely discredit this area ofwork important for digital transformation, it is necessary subjectively based upon participation among all potentially interested parties planning new and developable products with respect by the interest on which intended beneficiaries make grace from applications that will change their target accordingly into what plans we follow (Larionov et al., 2021; Tulchinsky, 2017). In our country, where increasing intensity of use technologies in digital areas by organizations still is relatively low that some sectors are global leaders on transformation. (Shakhgiraev & Zubairaev, 2021). There is a most striking example in the financial sector. Russia comes first (82%) among European countries with terms of the level implementation financial technologies in consumer segment. Здесь действует главный фактор – желание граждан активно применять новые solutions. Digital transformation, which has been often need to carry out in economic and social sphere is especially paramounty now. Through this mind training of personnel with sufficient qualifications can help you develop digital competence into the sector for growth institutions or regulation that creates favorable conditions through development networks.

4. Research Methods

In the course of the study, statistical, comparative methods of analysis, regression and correlation were used. The research methodology for this study also involved a systematic review of existing literature on innovative activities and digital tools in the digital economy. This included reviewing scholarly articles, reports, books, and other relevant sources of information related to the topic. The analysis was then conducted to identify current patterns and trends in the use of digital tools for innovative activities.

5. Findings

Today, digital transformation covers the full range of products and services of the financial sector, as well as key business processes: from communications with end users to storage and processing of data

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arrays, from decision-making procedures to channels for offering and servicing products and services. The largest financial institutions are intensively mastering advanced technologies. In particular, a number of leading banks, including Nationwide, HSBC (Hongkong and Shanghai Banking Corporation), RBS (Royal Bank of Scotland) and others, have switched to open APIs and use them in their digital ecosystems, which allows them to open new high-yield segments market, going beyond the financial services sector. Such ecosystems have a horizontal structure - partnerships are built between banks, fintech companies and non-financial businesses (Shakhgiraev & Zubairaev, 2021). Due to such changes in business models, banks are becoming a key sales channel not only for banking, but also for other financial products - insurance, brokerage, trust management, etc. At the same time, the lack of funds for the development and implementation of complex IT solutions in small and medium-sized banks causes their interest in accessing the platforms of the big players (Ilyasov, 2018). As a consequence, the largest banks involve the smaller ones in their ecosystems. Many foreign credit institutions integrate services into their ecosystems using the BaaS13 model. For example, Berlin-based Solarisbank offers its customers all over Europe a fully digital BaaS platform.

The modular structure allows you to selectively integrate any of the available services — bank accounts, transactions, payment cards (Murtazova, 2022). There are many such examples. The global mobile payment market is growing rapidly, estimated at $1.48 trillion in 2019 and projected to reach $12.06 trillion by 2027, growing at an average annual rate of 30.1% since 2020 to 2027 (Ilyasov, 2018). Growth in the number of smartphone users and a growing e-commerce business have been key drivers of this development. The use of NFC (Near Field Communication) technologies, SMS-based transaction payments and direct mobile billing have proven to be in high demand during the COVID-19 outbreak. High demand for contactless payments in retail stores has led to historically the highest mobile payment market share in the retail segment, as the use of this technology reduces the likelihood of transmission of the virus (Murtazova, 2022). The past year was marked by another round of increasing market value and the spread of cryptocurrencies. As of March 2021, there were approximately 4,800 cryptocurrencies worldwide with a total market capitalization of $1.9 trillion, up 6x from $326 billion in March 2020 (Shakhgiraev & Zubairaev, 2021). Against the backdrop of a decrease in cash turnover in the context of the COVID-19 pandemic, the number of commercial payments using cryptocurrency has grown significantly. The largest companies in various sectors of the economy have implemented systems that use digital currencies as a form of payment. Among them are Microsoft Corporation, Visa Inc., AT&T Inc., BMW AG, Tesla, etc. One of the domestic examples is the Global Palladium Fund, established by Norilsk Nickel, has issued its own digital tokens on the Atomyze platform for settlements with counterparties (Shakhgiraev & Murtazova, 2019). One of the cryptocurrencies actively used in retail is Dash. In Q1 2020, active Dash wallets on mobile grew to 102,000 (up 214% year on year). The key region for the outstripping distribution of such use of cryptocurrencies is Latin America. For example, Burger King in Venezuela has started a partnership with the Cryptobuyer processing service, allowing its visitors to pay with cryptocurrencies. In Brazil, more than 2.5 million online stores using the Atar Pay solution have the ability to accept cryptocurrency (Ilyasov, 2018). Today, the central banks of more than 70 countries of the world, including Russia, are considering the prospects for issuing their own digital currencies. Pilot projects are being implemented in six countries, including China, South Korea and

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Sweden. In three countries - Uruguay, Ukraine and Ecuador - testing of the national digital currency has been completed. At the same time, the Bank for International Settlements, together with seven central banks, including the US Federal Reserve, the European Central Bank and the Bank of England, published key requirements for such a digital currency (Murtazova, 2022).

In the process of analyzing and forecasting innovation activity in the digital economy, the following management techniques proposed earlier by Malakhov (Henderson & Clark, 1990): – change management; – development of a management plan for influencing factors; – involvement of personnel in the design of innovative activities in the digital economy. Methodological tools for analysis and forecasting of innovation activity should be based on a system of indicators, which should include financial and time indicators that characterize innovation activity in the digital economy, namely: ; - temporary, taking into account the dynamics of innovation. (This group can include an indicator of innovation, the duration of the development of innovation, the production cycle of innovation, the life cycle of innovation); - quantitative, taking into account the renewal of innovative products, including the number of exports and imports of innovations, the number of purchased new technologies, the number of implemented innovations; - structural, taking into account the subject composition of innovation, in particular, the number of innovative enterprises in the industrial sector, the number of responsibility centers in the enterprise responsible for innovative developments, the number of research teams and research laboratories (Hayton, 2005). The modeling process should be carried out on the basis of parametric models. One of these models is the matrix proposed by Mingaliev. The parameters of the model, on the one hand, are alternative options (scenarios) of innovative development, and on the other hand, the parameters responsible for the results of innovative activity; conditions and resource opportunities; optimality (quality) of innovative activity. Forecasting of innovative activity, first of all, is aimed at achieving the set goal - solving those problems in innovative development that were identified in the course of the analysis (Shakhgiraev & Murtazova, 2019; Shakhgiraev & Zubairaev, 2021). The purpose of innovation is to conduct scientific research and implement their results in the production of the latest product in order to enter a new market or achieve strategic goals for the formation of long-term relationships with business partners, both within the country and abroad, and as a result, strengthening its competitiveness in the market. Based on this, forecasting itself can be divided into three types: short-term, medium-term and long-term. Such a classification is explained by the timing for which the forecast is made and the sequence of fulfilling the tasks determined by the company's management in this area of business activity. As a rule, work in this direction should be carried out in several stages. At the first stage, the task for the forecast is analyzed. In this case, it is established what needs to be predicted, that is, the specific direction of the innovative functioning of an enterprise, industry or state. At the second stage, the object of forecasting is determined - an industrial enterprise, an industry as a whole, or a new innovative product (Henderson & Clark, 1990). At the third stage, the period for which the forecast will be formed is identified. The implementation of the third stage must be approached quite seriously. This is explained by the fact that the decision on its implementation will also depend on the forecasting period.

The development and intensive implementation of digital platforms, distributed ledger systems and cloud technologies in previous years literally transformed the financial sector, putting it among the leaders in digital transformation (Hayton, 2005). Along with platform solutions, a variety of digital

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technologies are widely used in financial organizations, radically restructuring the business processes of these organizations. One of the basic technical solutions most significant for the digital transformation of the financial sector is the technology for remote authentication of individual clients during financial transactions. It is based on the use of customers' biometric data (individual fingerprint parameters, face profile) when making mobile payments. Many organizations are moving from hybrid to fully automated models for managing key indicators and tools that use not only financial, but also any available types of information about assets and the environment, including social and natural phenomena, etc. Metasubject models are being developed that take into account multifactorial data sets (Big Data), including aggregation and processing of incoming data 24/7. Many organizations are moving to legally significant electronic document management. Intensive development of services-assistants for financial solutions (robo-advising) ensures the acceleration of the influx of new clients, individuals, into the financial markets (Hayton, 2005). However, the digital transformation of the financial sector is far from being limited to the introduction of advanced digital technologies in traditional financial institutions (banks, investment companies, etc.) and the related changes in their relationship with customers. In the 2010s, the development of new technologies (big data, AI, robotization, biometrics, cloud technologies, distributed ledger systems) and financial instruments, the emergence of many fintech companies12 led to the fact that banks and other specialized financial organizations actually lost their monopoly on providing payment services (Henderson & Clark, 1990). Using banking and their own infrastructure, non-financial organizations, including large technology companies and fintech startups, create digital ecosystems and actually enter the financial services market (Shakhgiraev & Murtazova, 2019). Thus, electronic payment systems (PayPal, YuMoney (formerly Yandex.Money), etc.) provide a wide range of opportunities for paying for services, goods, transfers between accounts, and the issuance of virtual and plastic cards by some of them (though in cooperation with banks) has become a clear example of a large-scale entry of non-financial companies into the area that was considered the exclusive domain of banks 10 years ago. At the same time, despite some competition, traditional credit institutions are actively establishing cooperation with fintech companies. This allows them to get a number of “ecosystem” benefits, including the fast, cheap and targeted provision of basic financial products, the use of new marketing channels to attract new customers. In addition, banks gain access to data on the consumer behavior of potential customers, which makes it possible to create personalized products and services, as well as increase financial inclusion by attracting consumers who were previously considered too risky due to the lack of sufficient information about them (Solow, 1957).

At the fourth stage, the collected information about the object, in respect of which the forecast will be formed, is evaluated. At the last, fifth, stage, the enterprise selects a tool that will make it possible to form a forecast to achieve the set goal. If a situation arises when an enterprise decides to produce a completely new innovative product, and this requires the formation of an innovative project and the re-equipment of the production process, then such decisions are usually made with a medium-term forecast. Here, a detailed analysis of the market is carried out and a decision is made on the cost of an innovative product and the choice of the market for its sale. As a rule, such decisions are made when the product is promoted in the national market. A slightly different procedure for making a decision is if an enterprise begins to introduce an innovative product to the international market. In this case, it becomes necessary to

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study the global market and the external environment, in addition, special attention is paid to political, economic, social factors that influence the adoption of relevant decisions. Further, it is important to analyze the technological support and decide on the need to change the technology for an innovative product that will be presented on the international market. As a result of such actions, the enterprise forms a production strategy for a new innovative product for a specific market for a long-term period.

6. Conclusion

When forecasting innovation activity in the digital economy, quite a lot of different tools are used, incl. innovative. The forecasting tool defines how “a combination of techniques and ways of thinking that contribute, through the presence of information from the analysis of the external and internal environment of the organization, to realize the assumption of long-term development”. A forecasting tool can also be defined as “a way of studying the organization to be forecasted, focused on generating forecasts”. Thus, the use of tools in forecasting should be focused on the direct formation of forecasts for the development of innovative activities of enterprises in the near future.

When choosing a specific forecasting method, it is necessary to focus on obtaining the desired result and conduct a detailed analysis of their capabilities. The efficiency of making a forecast at an enterprise will increase if the responsible persons approach its formation as thoroughly as possible. Only a detailed analysis of the current situation will allow specialists to make an optimal development forecast for a specific period of time. In practice, when forming forecasts for various innovative solutions, it is necessary to apply both factual and expert forecasting methods. Enterprises can use various applied tools that allow forecasting the innovative functioning of enterprises, industries and states. The simplest tool is MS Excel or other DBMS software products or ERP systems. However, the use of these products, which are not specialized programs, does not make it possible to accurately form a forecast in the event of a more complex situation, especially when it becomes necessary to take into account external factors of influence. As part of forecasting the innovative functioning of enterprises, many enterprises use the STATISTICA software product, which allows you to carry out the necessary statistical calculations, visualize them by building graphs and diagrams with a perspective orientation. This software product has various applications in organizations of different organizational and legal forms and scales of functioning (Ilyasov, 2018): 1) STATISTICA version for a single user (singleuser). 2) software product used in the network (concurrent network). International experience shows that the digital economy is developing over time in all countries that are part of the world community. Digital technologies in the economy began to be actively used abroad (Great Britain, Germany, China, etc.), then the transition of the economy to the digital format was carried out in Russia. Considering that the territory of the Russian Federation is huge, the introduction of the digital economy was carried out gradually, starting with several industrial enterprises of the Central District, then this process covered other geographical segments of the country. At the moment, all participants in economic relations have fully or partially switched to digital technologies. The processes of digitalization of the economy taking place in the world and in our country have prompted market entities to use innovations in their activities.

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References

Dzhemaldinova, M. u., Esmurzaev, Z. K., & Guzueva, E. R. (2021). Industry 4.0. Digital transformation of business. *Trends in the development of natural sciences in the modern information space and their application in agrobiotechnologies. Collection of articles of the I student scientific and practical conference* (pp. 52-56). Kadyrov Chechen State University. https://doi.org/10.36684/51-2021-1-52-56

Ennen, E., & Richter, A. (2010). The Whole Is More Than the Sum of Its Parts— Or Is It? A Review of the Empirical Literature on Complementarities in Organizations. *Journal of Management, 36*(1), 207-233. https://doi.org/10.1177/0149206309350083

Gishkaeva, L. L., Kataev, A. A., & Khekhaeva, Z. V. (2021). New Challenges for the Labor Market. *Economics and Business: Theory and Practice, 8*(78), 40-43. https://doi.org/10.24412/2411-0450-2021-8-40-43

Gompers, P., & Lerner, J. (2001). The Venture Capital Revolution. *Journal of Economic Perspectives, 15*(2), 145-168. https://doi.org/10.1257/jep.15.2.145

Hayton, J. C. (2005). Promoting corporate entrepreneurship through human resource management practices: A review of empirical research. *Human Resource Management Review, 15*(1), 21-41. https://doi.org/10.1016/j.hrmr.2005.01.003.

Henderson, R. M., & Clark, K. B. (1990). Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms. *Administrative Science Quarterly, 35*(1), 9. https://doi.org/10.2307/2393549

Ilyasov, R. K. (2018). Spline modeling and analysis of relationships in the economy with the possible presence of regression switching points. *St. Petersburg State Polytechnical University Journal Economics, 11*(4), 165-175. https://doi.org/10.18721/JE.11412

Larionov, V. G., Sheremetyeva, E. N., & Gorshkova, L. A. (2021). Digital transformation of higher education: technologies and digital competencies. *Vestnik of Astrakhan State Technical University Series: Economics, 2021*(2), 61-69. https://doi.org/10.24143/2073-5537-2021-2-61-69

Murtazova, K. (2022). Ecological and economic assessment of sectoral agricultural technologies. *BIO Web of Conferences, 43*, 02021. https://doi.org/10.1051/bioconf/20224302021

Saidov, Z. A., & Yalmaev, R. A. (2021). The impact of digital transformations on the economy and human life. *Federal State University Science, 2*(22), 63-68. https://doi.org/10.36684/37-2021-22-63-70

Shakhgiraev, I. U., & Murtazova, K. M.-S. (2019). Green structures in the concept of sustainable development of modern cities. *Regional building complex: investment practice and implementation of PPP: materials of the All-Russian scientific and practical conference*, 376-383. https://elibrary.ru/item.asp?id=41509676

Shakhgiraev, I. U., & Zubairaev, A. A. (2021). Financial security management of the enterprise. *IV All-Russian Scientific and Practical Conference The Impact of the New Geopolitical Reality on Public Administration and development of the Russian Federation*, 236-242. https://doi.org/10.36684/48-2021-1-236-241

Solow, R. M. (1957). Technical Change and the Aggregate Production Function. *Review of Economics and Statistics, 39*(3), 312-320. https://doi.org/10.2307/1926047

Tulchinsky, G. L. (2017). Digital transformation of education: challenges of higher education. *Philosophical Sciences, 6*, 121-136. https://www.elibrary.ru/item.asp?id=30041197

Uvarov, A. Y., Gable, E., & Dvoretskaya, I. V. (2019). *Difficulties and prospects of digital transformation of education*. Publishing House of the Higher School of Economics.