



## Digital Economy and Technology Development

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Innovative digital technologies—supported by humanistic societies—are required to balance our economic advancement and environmental regeneration. The well-being of our future will depend on how well we can produce technologies that can improve our climate, health, social equity, and stability.

New technologies have been used to enhance productivity, the quality of education, and the quality of life, and to promote healthy lives for everyone. For example, we are using technology to tackle global challenges such as the COVID-19 pandemic-related health improvements and virtual activities. Furthermore, cities today are more sustainable in terms of providing economic resource sharing, autonomous mobility systems, zero emission industrial products, facilities for recycling waste, and organic food to the urban population to name a few. Digital technology solutions can be used to integrate circular economy principles from the design stage to the post-construction/manufacturing stage.

Furthermore, the processes of innovation diffusion reshape economic systems and cause structural changes in different economic sectors. These innovations have become the basis of the new digital infrastructure of society. The technological revolution of recent years has made it possible to transform entire systems of production, management, and governance into more effective and efficient systems in connected societies.

In this special edition, 25 papers were selected from the 3rd International Scientific Conference on Innovations in Digital Economy SPBPU-IDE 2021, which discussed theory and application regarding digital economy and technology development. The conference SPBPU IDE-2021 was organized by Peter the Great St. Petersburg Polytechnic University (SPbPU) and Universitas Indonesia and brought together experts from the academia and industry to enhance digital transformation of economic systems.

The first paper, written by A. Zaytsev, N. Dimitriev, D. Rodionov, and T. Magradze, is titled “Assessment of the Innovative Potential of Alternative Energy in the Context of the Transition to the Circular Economy.” The authors investigate innovative alternative

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energy solutions and develop an assessment of alternative energy when transitioning to a circular economy. They argue that this assessment enables rating the potential alternative energy before making a decision.

The second paper, written by E. Burova, S. Grishunin, S. Suloeva, and A. Stepanchuk, is titled "Cost Management for Innovative Products of an Industrial Enterprise Given the Risks in the Digital Economy." Industrial enterprises must lower their costs because of the risks involved in making innovative products. The authors investigate these risks and argue that by developing effective cost management, enterprises can mitigate risk and make innovative products appropriately.

The third paper, written by S. Egorova, N. Kistaeva, A. Kulachinskaya, A. Nikolaenko, and S. Zueva, is titled "Development of Methods for Assessing the Impact of Environmental Regulation on Competitiveness." A method must be developed for assessing serious environmental considerations. Thus, the authors develop methods based on competitiveness to successfully assess the impact of environmental regulation.

The fourth paper, written by A. Babkin, L. Tashenova, D. Mamrayeva, and T. Andreeva, is titled "A Structural Functional Model for Managing the Digital Potential of a Strategic Innovatively Active Industrial Cluster." There is a pressing need to develop an innovative model for the digital industrial cluster. Therefore, the authors develop a structural functional management model to cluster industrial entities.

The fifth paper, written by S. Gutman, P. Vorontsova, and V. Seredin, is titled "Evaluation of Readiness of the Urban Environment to the Introduction of the Concept of 'Smart Transport' in the Subjects of the Russian Federation." To avoid accidents, a smart transport concept should be introduced for urban environments to evaluate its readiness in the Russian Federation. The authors argue that this evaluation can significantly reduce accidents.

The sixth paper, written by T. Kudryavtseva, A. Skhvediani, V. Iakovleva, and A. Cherkas is titled "Algorithm for Defining Clusters Based on Input-Output Tables: Case of Construction Cluster of Russia." The authors develop an input-output table using an algorithm for the construction cluster in Russia. They argue that this approach enables successful clustering in the Russian construction sector.

The seventh paper, written by N. Egorov, A. Babkin, I. Babkin, and A. Yarygina, is titled "Innovative Development of the Far North Regions: Rating Assessment based on the Triple Helix Model." The authors develop a rating assessment based on the triple helix model for the far north regions of Russia, and they argue that the innovative development in far north regions will be successfully identified.

The eighth paper, written by A. Babkin, V. Glukov, E. Shkarupeta, N. Kharitonova, and H. Barabaner, is titled "Methodology for Assessing Industrial Ecosystem Maturity in the Framework of Digital Technology Implementation." The authors believe that the maturity of the industrial ecosystem should be assessed using an appropriate methodology. They develop a framework for digital technology implementation and argue that it can successfully assess the industrial ecosystem.

The ninth paper, written by I. Babkin, O. Pisareva, A. Starikovskiy, M. Guljakhon, and Yulia Anoshina, is titled "Justification of an Integrated Approach to Ensuring Information Security of Unmanned Vehicles in Intelligent Transport Systems." While unmanned vehicles are growing in popularity, there is a lack of information regarding their security. The authors model an integrated approach that can thoroughly justify these vehicles' information security.

The tenth paper, written by O. Smirnova, E. Kharitonova, I. Babkin, V. Pulyaeva, and M. Haikin, is titled "Small-Scale Biofuel Production: Assessment of Efficiency." Small-scale

enterprises should develop accurate assessment tools to ensure efficient production. The authors provide an assessment model for efficiency and argue for its success.

The eleventh paper, written by M. Rodionova, A. Skhvediani, and T. Kudryavtseva, is titled "Analysis of Vehicle–Pedestrian Accidents: Case of Saint Petersburg, Russia." Pedestrian accidents frequently occur in the city of Saint Petersburg. The authors argue that they have successfully conducted a thorough analysis of these vehicle–pedestrian accidents.

The twelfth paper, written by E. Tereshko and I. Rudskaya, is titled "Systematic Approach to the Management of the Construction Complex in the Conditions of Digitalization." The authors investigate how construction complex projects can be successfully handled by developing a digitized systematic approach to management.

The thirteenth paper, written by M.A. Berawi, N. Suwartha, A.V. Salim, G. Saroji, and M. Sari, is titled "Developing a Mobile Application for a Land Value Capture Scheme to Finance Urban Rail Transit Projects." The authors develop a mobile application to capture land values for creating financial schemes, using urban rail transit as a case study. The authors argue that this financial scheme is able to ease financial exposure efficiently and effectively.

The fourteenth paper, written by M. Khaykin and O. Toechkina, is titled "Service Capital as a Condition for the Sustainable Development of Society." Sustainable development can be achieved in many ways, including service capital. Developing service capital aims to be a condition applied to society.

The fifteenth paper, written by T. Kisel, is titled "Cost Efficiency of the BIM Technologies Use at the Stage of Real Estate Object Maintenance." Maintenance in real estate projects is generally a costly activity, and the authors offer a cost-efficiency model to overcome these problems by using BIM technology to maintain real estate projects.

The sixteenth paper, written by S. Grishunin, S. Suloeva, V. Shiryakina, and E. Burova, is titled "Analyzing Insolvency Drivers and Developing a Credit Rating System for Small and Medium Enterprises in Russia." Small and medium enterprises must always pay attention to researchers to overcome their financial limitations. The authors identify and analyze insolvency drivers in terms of financial limitations before providing an appropriate credit rating system.

The seventeenth paper, written by E. Efimov, E. Koroleva, and A. Sukhinina, is titled "Competitiveness in the FinTech Sector: Case of Russia." FinTech is growing throughout the world, including Russia, as an innovative practice for financing enterprises. The authors propose appropriate financial services using FinTech to increase financing productivity.

The eighteenth paper, written by M. Belousova and O. Danilina, is titled "Game Theoretic Model of the Species and Varietal Composition of Fruit Plantations." Optimization is used to solve problems in the fruit plantation sector. The authors use game theory with two determinant variables: species and varietal composition. They argue that this approach would overcome the problems in fruit plantations.

The nineteenth paper, written by N. Victorova, E. Vylkova, V. Naumov, and N. Pokrovskaya, is titled "The Interrelation between Digital and Tax Components of Sustainable Regional Development." Regional sustainable development in Russia is a complex problem to solve, and the most significant method is tax. The authors develop a model that integrates digital and tax components to overcome problems in sustainable regional development.

The twentieth paper, written by V.V. Godin and A.E. Terekhova, is titled "Digitalization of Education: Models and Methods." Innovative education, in general, requires support

from digitalization. Thus, the authors develop models and methods for facilitating digitalization in the education sector.

The twenty-first paper, written by P. Aleksandra, Z. Dmitry, and K. Vladimir, is titled “A Study of Uncertainty Contribution to Cryptocurrency Investment Dynamics.” Despite its controversy, cryptocurrency is becoming increasingly popular. The authors attempt to solve the uncertainty problem associated with cryptocurrency to make it safer for the public.

The twenty-second paper, written by V. Brazovskaia and S. Gutman, is titled “Climate Risks of Using Smart Grids based on Renewable Energy Sources.” Renewable energy sources have become the main interest of many researchers. The authors develop a smart grid model to solve climate change risk. They argue that this model will support renewable energy development.

The twenty-third paper, written by O. Nadezhina, V. Zaretskaya, Y. Vertakova, V. Plotnikov, and D. Burkaltseva, is titled “European Integration Risks in the Context of the Covid-19 Pandemic.” The Covid-19 pandemic has yet to be overcome, and collaboration among European countries is necessary to develop a model of integration risk. The authors promote the necessity of modeling the integration risk among the European community.

The twenty-fourth paper, written by S. Petrov, S. Yashin, N. Yashina, O. Kashina, N. Pronchatova-Rubtsova, and V. Kravchenko, is titled “Digital Techniques Share Prices Modelling based on Time-Varying Walrasian Equilibrium under Exchange Processes in the Financial Market.” The financial market, particularly the exchange process, plays a critical role in the Russian economy. The authors develop a digital share price model using time-varying Walrasian equilibrium to solve share price problems.

The twenty-fifth and final paper, written by E. Rytova, P. Otrubyannikova, and N. Victorova, is titled “Impact of Innovation on the Economic Efficiency of Power Engineering Enterprises: Assessment of Interdependence.” Power engineering enterprises (PEE) are always needed, even in remote areas. However, the main problem is low efficiency. The authors offer a study of the impact of innovation on PEE to increase their efficiency by conducting an appropriate assessment.

We hope that this edition of IJTech conveys some new insights, particularly regarding the development of the digital economy and technology, which is necessary in this digital era.

With warmest regards from Jakarta,



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