
THE APPLICATION OF DATA SCIENCE IN REGIONAL ECONOMY

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Abstract

This article analyzes the use of Data science in the regional economy. In addition, in this article, the author analyzed the geography of the region and the ability of human activity to bring maximum economic benefit to the general development and prosperity of the region. As a result of these analyses, he developed a number of scientific proposals and recommendations on the application of Data Science in the regional economy.

Keywords: data science, region, digitalization, economy, regional economy, geography, science.

Introduction

A feature of the current stage of socio-economic development is the inseparability of people's activities in the production of public goods with the processes of creating, processing and using huge amounts of digital information. Digital technologies are rapidly being introduced into every area of people's lives and activities, along with electronic, computer, network and other automated technologies. In the digital environment, appointments with a doctor, communication, purchases, production of goods and services, distance education, online paperwork and much more are carried out. All this led to the formation and development of the digital economy, including in Russia. The use of digital economy tools is designed to provide significant benefits in the lives and activities of the population, government and business.¹

The digitalization process, like any other, uses certain tools. The tools of the digital economy are artificial intelligence technologies, blockchain, the Internet of things, cloud computing, cyber-physical systems, machine learning, neural networks, robotics, virtual reality, including big data.²

Big data or Big Data is understood as constantly growing volumes of information, united by one context, but differing in presentation formats, methods and means of processing. As a result of the rapid improvement of computing technology, the amount of data can hardly play the role of an accurate criterion for determining them as large. An example would be big data units, currently in terabytes and in the future petabytes. More precise characteristics of big data are expressed by the degree of their structure and presentation options. Every day, the population deals with big data that comes in the form of messages from social networks, in the form of information from video recording devices, meteorological data, geolocation coordinates of a cellular subscriber, etc.

¹ Исайченкова, В. В. (2019). Обеспечение повышения конкурентоспособности промышленного предприятия в условиях цифровой экономики. *Век качества*, (2), 91-105.

² Китайгородский, М. Д. (2018). Индустрия 4.0 и ее влияние на технологическое образование. *Современные наукоемкие технологии*, (11-2), 290-294.

Discussion and Result

It is important to note that with the help of Data Science, it is possible to move to a qualitatively new level of accumulation, structured data storage in order to further analyze the economic performance of a company in any area of activity.

For example, A.D. Sterlikova³ substantiates the need to use Data Science technology to predict the dynamics of the key interest rate of the Bank of Russia and the likelihood of revoking a license from a credit institution. A. A. Masyutin⁴ considers the possibility of using Data Science tools to solve problems of credit risk management. A. A. Sokolov⁵ proposes to improve decision support methods in energy resource supply systems at machine-building enterprises using Data Science technologies.

It should be noted that the issues of applying modern algorithms for working with data invariably attract interest in the scientific community and among practitioners. The most extensive research in this area is carried out by foreign specialists, since the issues of working with large volumes of digital information, the formation of large-scale databases, and the adoption of managerial decisions based on the analysis of big data (Big Data) received their initial development in Western countries and a significant amount of information has been accumulated here. practical experience in the application of Data Science.

At the same time, there are a number of domestic developments in this area. For example, I. E. Akkuratov cites the experience of modeling in the oil and gas industry using neural networks and Data Science⁶. A. V. Ozerov, A. M. Olshansky and A. P. Kuropteva⁷ note the success of using Data Science for predictive analytics in railway transport. A. V. Tikhonova, E. A. Voronin and A. I. Sidorov⁸ present a positive experience of using Data Science methods for analyzing big data in the field of agro-industrial production.

It should be recognized that the issues of data analysis and management decision-making at the business unit level are considered by many foreign and domestic scientists, but for the most part these studies do not concern the possibilities of evaluating the effectiveness of economic activity using Data Science technologies. Therefore, we believe that in the context of the need to develop the Russian economy in the digital age and in a situation of sanctions pressure, a systematic and comprehensive study of methodological and practical approaches to the use of Data Science technologies is necessary to conduct an economic analysis of the activities of market entities, as well as existing problems in this area.

³ Стерликова, А. Д. (2020). Big Data, Data Science и Банк России: потенциал "цифры" в банковском регулировании и надзоре. In *Российская наука: актуальные исследования и разработки* (pp. 234-237).

⁴ Масютин, А. А. (2014). Поведенческие финансы как новое направление финансовой теории. *Банковское дело*, (12), 51-54.

⁵ Рустамов, В. И. (2022). ПРОБЛЕМАТИКА ПРИМЕНЕНИЯ ТЕХНОЛОГИИ DATA SCIENCE ДЛЯ АНАЛИЗА ЭКОНОМИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ ОРГАНИЗАЦИИ. In *Перспективы развития современных социально-экономических процессов* (pp. 32-36).

⁶ Аккуратов, И. Е. (2019). Моделирование в нефтегазовой отрасли с использованием нейросетей и Data Science. *Энигма*, 1(12-1), 151-154.

⁷ Озеров, А. В., Ольшанский, А. М., & Куроптева, А. П. (2020). Предиктивная аналитика с использованием Data Science на железнодорожном транспорте. *Наука и технологии железных дорог*, 4(4), 63-76.

⁸ Тихонова, А. В., Воронин, Е. А., & Сидоров, А. И. (2020). Системный подход к анализу больших данных АПК с использованием методов Data Science. In *ИСТОРИЯ, СОВРЕМЕННОЕ СОСТОЯНИЕ И ПЕРСПЕКТИВЫ ИННОВАЦИОННОГО РАЗВИТИЯ ОБЩЕСТВА* (pp. 24-34).

Regional economics is a branch of economics that is often called a social science. It analyzes the economic element of spatially analyzed regional problems in order to derive theoretical or policy implications for regions whose geographic scope varies from local to global regions.

Regional economy: refers to the ability of a region's geography and human activities to produce maximum economic benefits for the overall development and prosperity of the region.

Regional science, which grew out of Walter Isard and other economists' dissatisfaction with current regional economic analysis, shares many traditions with regional economics. The "economic" approach to regional problems has been and remains the most important approach in the history of regional science, despite the somewhat pessimistic view of regional economics. It also developed its own traditions and methods, appropriate to its subject matter or its view of economics as a sub-discipline.

Location theory and the theory of external economies from "localized industries" (as described in Alfred Marshall's "Principles of Economics" published in 1890) served as the theoretical basis for regional economics, a major component of regional science. Location theory was developed independently in Germany and North America at the beginning of the 20th century. The economic approach to places (industrial and consumer) as the foreword and content of August Losch's work has become crucial in both regional economics and regional science. An English translation was made in 1954 by V. H. Voglom under the title "The Economy of Location" and it has been on permanent display. The major contributions of American scholars to the theorization and empirical investigation of regional problems in economics are Harold Hotelling's Spatial Approach to Economic Competition, published in The Economic Journal in 1929 under the title "The Stability of Competition," and Edgar M. Hoover's Location Theory and the Shoe and Leather Industry (1937) and location of economic activity (1948). Paul Krugman (1991: 498) emphasized the importance of economic geography and regional economics for economic development in his seminal article Growth Profitability and Economic Geography, concluding with the following scholarly wish: "So I hope. This article regional economics and economic geography will be a motivating factor for revitalizing research.

Vinod Dubey has summarized the following four approaches to defining the regional economy. The first approach is to "deny the possibility of isolating such a discipline." According to Vinod Dubey (1964), Harvey Steven Perloff, who co-authored "State and Local Finance in the National Economy" (with Alvin Harvey Hansen) and "Territory, Resources, and Economic Growth" (with Edgar S. Dunn, Eric E. Lampard and Richard F. Muth), rejected the possibility of division of regional studies or regional science into "parts parallel to applied sciences". The second approach follows the definition of Lionel Charles Robbins (1932: 15), "Economics is the study of human behavior as a relation between ends and scarce means which can be applied to alternative ends", for the economic problems that arise here. regions. The third approach is to define regional economics as a sub-discipline of economics that provides spatial general balance. This approach was emphasized by L. Lefebvre and HO Nourse. A fourth approach is to define it as a sub-discipline of economics dealing with immobile resources. This view was supported by GH Bortz (1960), JL Stein (1961) and JR Meyer (1963).

In his book Regional Economic Growth (1969), Horst Siebert defined regional economics as the study of the economic behavior of people in space. Based on the definition of regional economy as a system of scientific answers to the question "What where and why - and so what?" An Introduction to Regional Economics (New York: Alfred A. Knopf, 1971; 3rd ed. 1984) Edgar M. Hoover and Frank Giarratanai and

Dubey's (1964: 29) definition of regional economics as "the study of differentiation". and the interconnectedness of regions in a world of unevenly distributed and imperfectly mobile resources, with a particular focus on planning social capital investments to mitigate social problems in these situations, "this can be defined as the study of how systems. what to produce and reproduce with abundant) and scarce resources or public goods distribution.

Conclusion

The use of information and computer technologies in the learning process provides new opportunities for developing the creative potential of students in the following areas:

- increases the motivation of students and their interest in mastering digital technologies;
- there is a development of new material as active participants in the learning process;
- the ability to use various methods of logical and mathematical thinking is developed: analysis, modeling, comparison, generalization, induction, deduction, modeling, methods of higher mathematics, mathematical statistics, etc.;
- in the process of using the Internet as a source of the latest legislative and regulatory information, one acquires the skills of independent study and analysis of this information for flexible use in all necessary cases;
- methods of using ICT are used in complex practical situations that may arise in practical activities;
- the level of communication between students and teachers is improving with the constant use of ICT in the educational process.

The strengthening of the role of information technology in education indicates that there has been a change in priorities in personnel training, which is also confirmed by the examples of foreign countries. The problems of improving the education system in the era of the modern development of the digital economy require the expansion of the use of information and computer technologies in the learning process.

Teaching economic disciplines using the introduction of information technology from the very first steps of education contributes to the training of specialists capable of active work in the economy of a new technological generation, with the necessary digital communication skills.

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