

Problems of Regulation and Prospective Development of E-commerce Systems in the Post-coronavirus Era

Alovsat Garaja Aliyev

Institute of Information Technology of Azerbaijan National Academy of Sciences. AZ1141, Baku, Azerbaijan
E-mail: alovsat_qaraca@mail.ru; alovsat.qaraca@gmail.com
ORCID Id: <http://orcid.org/0000-0002-1174-8036>

Received: 24 April, 2022; Revised: 12 June, 2022; Accepted: 24 September, 2022; Published: 08 December, 2022

Abstract: The article examines the application of e-commerce systems and technologies that have a positive impact on the development of the economy of the post-coronavirus period and the formation of appropriate technical and technological infrastructure for it, as well as promising features and directions of e-commerce. The physical and virtual opportunities created by e-commerce technologies for buyers and sellers are explained. The advantages of e-commerce in the international economic space have been identified. The functions of e-business models in accordance with the commercial stages of enterprises are explained. It was noted that the development of ICT has accelerated the process of transition from traditional commerce to e-commerce, led to the emergence of new global trends in e-commerce. These innovations have raised the issue of the application of modern ICT in the development of e-commerce on the platform of the 4.0 Industrial Revolution. Taking into account these factors, the presented article discusses the application of modern technologies in e-commerce systems, such as 3D modeling, the Internet of Things, artificial intelligence, big data. Features of application and regulation mechanisms of E-commerce systems in real economic sectors, which have a direct stimulating effect on economic growth in Azerbaijan, have been studied. Recommendations were given for the modernization and use of e-commerce systems with the application of the latest ICT technologies.

The purpose of the research. The main goal of the scientific research carried out in the article was to develop the scientific-methodological basis for the regulation of the application of e-commerce systems and the study of perspective development problems in the so-called post-coronavirus period after 2020. In the article, attention was paid to the problems of regulation of the application of e-commerce systems and the development of recommendations on increasing the efficiency of prospective development directions.

Taking into account the characteristics of the relevant electronic business models, applying them in accordance with the commercial stages of the enterprises' activities and obtaining effective results were among the main goals. Attempts have been made to implement e-commerce systems based on the developing technologies of the Industry 4.0 platform. An attempt was made to solve the issue of using modern ICT in the development of trade processes, which corresponds to the 4.0 Industrial revolution platform. The main stages of application of modern technologies such as 3D modeling, the Internet of Things, artificial intelligence, and Big Data in electronic commerce systems are described.

The following are included among the goals of the conducted scientific research: investigation of the application features and regulation mechanisms of e-commerce systems that have a stimulating effect on the economic development of Azerbaijan in real economic sectors, development of recommendations on increasing the efficiency of electronic commerce systems using modern ICT technologies, etc.

Research methods used. In the post-coronavirus period, the following research methods were used in the study of the problems of regulation of the application of e-commerce systems and prospective development directions and in the development of their scientific and methodological bases: a systematic analysis, correlation, and regression analysis, mathematical and econometric modeling methods, expert evaluation method, measurement theory, algorithmization, ICT tools, and technologies, etc.

Achievements of the author. Achievements of the author. In the so-called post-coronavirus period after 2020, a special approach was taken to the application of e-commerce systems and technologies, which have a positive impact on the development of the economy as an innovative element, and to the study of its prospective development features and directions. By providing scientific support to ensure the effective formation of the digital economy and its sustainability, the researcher offered relevant recommendations to achieve the solution to some of the goals set before the country. It should be noted that the development of e-commerce systems based on technologies relevant to the Industry 4.0 platform can give a serious impetus to the development of the sustainability of the digital economy.

Due to the fact that e-commerce technologies create new additional physical and virtual opportunities for buyers and sellers, the scientific-methodological approaches proposed by the author develop them as a special tool for ensuring

the stability of both e-commerce systems and the digital economy in general. The proposals presented will lead to more effective results for the economy to be more cyber resilient through the application of e-commerce systems in the so-called post-coronavirus era. The researcher showed that the effective application of electronic business models in the activities of enterprises can help to achieve effective results. In the development of e-commerce, solutions to the issues of application of 4.0 Industrial technologies such as 3D modeling, Internet of Things, artificial intelligence, and Big Data can be considered as a contribution to the investigation of solutions to existing problems in economic development. For this reason, the means and mechanisms proposed by the author for solving the problems of regulation of the application of e-commerce systems in the post-coronavirus era can be considered one of the main ways to ensure the stability and development of the digital economy.

Index Terms: Electronic trading and business, business-to-business (B2B) model, commercial cycle, digital transformation, Industry 4.0 technologies, Big Data, Internet of Things, e-commerce infrastructure, e-commerce systems, post-coronavirus cycle economics.

1. Introduction

A coronavirus pandemic that has left the world economy, virtually the real management system, the service sector, and the social life of society stunned since the beginning of 2020 [1] proved once again the importance of digitalization processes, and the ICT sphere in general [2]. As a result, in recent years, a new economic environment is being formed at the international and national levels, including in Azerbaijan, especially during the coronavirus pandemic, as well as in the post-coronavirus period. At present, national economic developments are becoming more regional and innovative. The share of the private sector continues to grow. The state provides all kinds of assistance to the development of entrepreneurship. In the new environment, the widespread use of e-commerce technology as an integral innovative element in the development of the economy as a whole, as well as entrepreneurship and the private sector, and the formation of appropriate infrastructure for it contributes to increasing economic efficiency and social welfare. Therefore, it is important to develop e-commerce at the national and regional levels through a comprehensive study of the application and development of e-commerce in the post-coronavirus period [3-5].

E-commerce offers the opportunity to radically influence the formation of customer requirements. This opportunity either radically changes the markets or creates a completely new type of market. Along with the business sector, individual members of society have access to completely new opportunities for access to goods and services, accessibility of information, and interaction with government agencies. In this case, the choice does not depend on geography and time constraints. Since the problem of supplying the market with standard goods can already be solved, the consumer will want to get products that meet their specific needs, which change over time. Linking the individual purchasing power of consumers with the production and planning system, ie the system of placing special orders while maintaining virtually reasonable prices and high levels of quality will be a determining factor in the ability of producers. These problems are being solved quite effectively with the help of modern e-commerce technologies. These technologies allow consumers to reach a maximum audience of consumers with different purchasing power, as well as to enter their orders into a management system with proven methods. E-commerce technology brings significant changes to the distribution and exchange of the entire turnover of reproduction. Therefore, in order to implement the effective structuring of the new economy in the country, there is a need for a comprehensive analysis of the problems of formation and current state of e-commerce systems. It is also important to study the perspective development directions of e-commerce systems for the post-coronavirus pandemic period. It is especially important to make relevant suggestions and recommendations in these aspects.

2. Level of Problem Statement and Research

E-commerce is a special form of traditional commerce, involving the process of electronically presenting, selling, and purchasing products or services over the Internet using ICT [6]. On the one hand, e-commerce allows buyers to browse a wide range of products offered by different companies at any time, from anywhere, just access the Internet, and buy the product they want through an online payment. On the other hand, it allows firms to demonstrate their products to more customers at a lower cost, trade globally, and respond more quickly to modern market demands [7]. For this reason, almost all companies now use e-commerce systems to display their products on the Internet. E-commerce systems are a complex system that combines ICT technologies and human resources, such as appropriate hardware, software products, and Internet protocols, to automate multiple transactions covering various stages of the online shopping process. There is a great need for continuous improvement of such systems. Thus, the formation and application of scientific and technological innovation policy are one of the key issues in the development of economies of developed countries. Digital transformation of the economy and society has become one of the priority issues in recent years. [8]. Development of the Internet, which is the basis of ICT infrastructure, the implementation of promising

digital projects such as "Government Cloud" (GCloud), "Big Data", "Smart City", "Smart Village" and others are a great support for the consistent reforms that aimed at turning Azerbaijan into a digital center in the region.

There is a need to expand the use of digitalization in various sectors of the economy, to improve quality. In the development of digital technologies, the improvement of regulatory mechanisms and the formation of a healthy competitive environment are of great importance for the country. Their implementation is one of the main goals [9].

It should be noted that the 4.0 Industrial Revolution Network Center of the World Economic Forum, the main platform for digital technologies in the country, has been launched in Azerbaijan. The Center will be closely linked to the implementation of the requirements of Sustainable and Sustainable Development 4.0 Industrial Revolution and will contribute to the development of the digital economy. The center will perform the functions of digitalization and application of modern innovative technologies to ensure sustainable and sustainable development. The center's activities will help the country achieve a rapid pace of development based on high technology. It will undoubtedly contribute to the expansion of regional digital cooperation. The activities of the center are of special importance and are focused on the issues facing the country.

Thus, it should be noted that the level of awareness about the technologies of the 4.0 Industrial Revolution and the digital economy should be increased. In this area, a competitive human capital and a production ecosystem based on high technology must be formed. The impact of ICT technologies and digitalization in the field of trade on the future development of the world economy must be comprehensively studied (<https://www.economy.gov.az>).

The establishment of the Azerbaijan Center of the 4.0 Industrial Revolution Network will facilitate the development of partnerships with leading countries in this field and the expansion of the use of e-commerce technologies. Prospects for the application of scientific, technical, and practical experience of leading countries in the field of such technologies to Azerbaijan will have a more effective impact on the sustainable economic development of the country. The work to be done to further expand digitalization in the trade sphere will create favorable conditions for the country to become a regional center of knowledge.

In connection with the degree of research and development of problems on e-commerce systems, it should be noted that the features of their development stages, the formation of scientific and technological bases have been the subject of research by many foreign, including Russian, and domestic scientists. Many fundamental scientific-theoretical and applied researches have been carried out for the development of scientific, technical, and technological aspects of e-commerce systems. At the same time, research work was carried out on the organization of improvement activities of traditional economic processes on the basis of e-commerce. In this regard, various researchers have tried to study the models of e-commerce systems analyzed in the scientific literature in recent years as different stages of the development of new trading processes. Therefore, in line with the challenges of the 4.0 Industrial Revolution, serious attention has been paid to identifying promising areas for the development of e-commerce systems in the post-coronavirus pandemic from mid-2020, which has become a trend in the major trade services sector of the world economy. It is not accidental that initially [10] focuses on the analysis of the current state of the ICT sector, which is one of the components of the Azerbaijani economy, and the identification of promising areas for its post-coronavirus pandemic. It was noted that in recent years, the field of ICT, telecommunications, and computer technology has become the main production and service sector of the world economy in accordance with the challenges of the 4.0 Industrial Revolution. As a result of the growing importance of these areas during the coronavirus pandemic, suggestions and recommendations were made on innovative development directions of the ICT sector for the post-coronavirus period.

3. Research of Relevant Related Works

The indicated scientific sources [11-22] are also evaluated as one of the steps taken for the more efficient functioning of e-commerce systems or digital economy. These sources also serve to form the effective infrastructure of the e-commerce system.

In addition, e-commerce markets are studied by many studies, including Skovikov [11], and a rating of major markets and key trends in this area is given. Trends in payment systems and cryptocurrency markets are analyzed. Molchanov [12] reviewed the situation of e-commerce in the People's Republic of China and found the attitude of customers to the use of neuromarketing tools in the system during the pandemic. It was noted that during the pandemic, customers showed greater loyalty to online commerce and significantly increased its use.

Merzlyakova [13] presents the main trends and perspective development directions of e-commerce in Russia. The rapid growth of the Russian e-commerce market, which has had a stable growth rate in the last decade, after 2018, is explained by the impact of the Covid-19 pandemic. Naumenko [14] studied the world's trends in the digital transformation of retail trade during the pandemic. It was noted that the development of e-commerce is influenced by factors such as 1) innovation - technical progress, 2) the penetration of the global market, and 3) increasing the level of professionalism.

Omarova [15] states that business models, strategies, and key development trends of e-commerce have been operatively studied on the basis of customer data and improved decisions have been made.

Bakunovich [16] considered the impact of Covid-19 on e-commerce. It was noted that the pandemic accelerates the process of digital change.

Abdurafikov [17] analyzes the development of the e-commerce market during the Pandemic. In this context, the positive effects of e-commerce on the entrepreneurship sector were noted. In the Erokhin [18] e-commerce was noted as a factor in the recovery of the economy of the People's Republic of China in the post-pandemic period.

[19] have explained the effects of the pandemic, and addressed issues such as the pandemic and e-commerce, e-commerce, and development. Global and regional trends have been noted both before and after the pandemic. The challenges, strategies, and prospects for improving e-commerce have been explored. Guven [20] has analyzed and evaluated changes in e-commerce during the pandemic process. Aishra [21] provides insights, reflections, and justifications for the future state and changes of e-commerce systems in the coming decade.

The analysis shows that there is a growing need to analyze new global trends in this area, to develop e-commerce on the platform of the 4.0 Industrial Revolution. Internet of Things, artificial intelligence, big data, etc. The application of modern technologies in e-commerce systems, such as, should be seriously studied. The application features and regulatory mechanisms of e-commerce systems in real economic sectors should be investigated. With the application of ICT technologies, there is a growing need to develop recommendations for the modernization and use of e-commerce systems [22-24].

4. Research Methodology

In the article, the problems of regulating the application of e-commerce systems in the post-coronavirus period and prospective development directions are taken as a research object.

Technologies for ensuring the effective application of e-commerce systems in the post-coronavirus period were included in the research subject.

In the post-coronavirus era, attempts have been made to determine the problems of regulating the application of e-commerce systems and prospective development directions and to examine the economic characteristics of e-commerce systems.

In the Industry 4.0 platform of e-commerce systems, the applications of the main development technologies to the development of the digital economy are taken into account. Efforts were made to determine the application of electronic business models to the activities of enterprises and to develop a system of indicators for the analysis of the stability of electronic commerce systems. Proposals and recommendations for evaluating the level of stability of e-commerce systems have been developed. International economic development trends, requirements of high and modern ICT technologies, and main trends of the Industry 4.0 platform have been taken into account in ensuring the sustainability of e-commerce systems.

5. Opportunities and Characteristics of E-commerce

The capabilities and features of existing e-commerce systems have been studied and improved with customer satisfaction in mind. The results of the practical application of e-commerce systems are taken as a basis.

During the pandemic, as well as in the post-coronavirus period, e-commerce technology allows buyers and sellers to take advantage of the following opportunities [25, 26].

- Doing business on a global scale. The e-commerce system allows even small suppliers and customers to do business worldwide.
- Increasing the competitiveness of sellers. E-commerce allows suppliers to increase their competitiveness by approaching the customer. Thus, many companies offer extensive pre-sales and after-sales service support.
- Individualization of sales. Using electronic means of communication, the company can receive detailed information about the requests of each individual customer and automatically offer products and services that meet his individual requirements.
- Prompt response to the inquiry. E-commerce allows you to significantly shorten the path of goods sent from the supplier to the customer. It offers an efficient way to reduce both financial and time costs. In special cases, maximum distance savings are achieved when products and services are delivered electronically.
- Cost reduction. An electronic sales contract, as a rule, reduces the cost of services. Any business process that uses electronic interaction between people has the potential to reduce costs for both parties.
- New business opportunities. E-commerce technologies create conditions for the emergence of completely new products and services. E-commerce has already proven its importance not only in reducing transaction costs, but also in matters of distribution and exchange in order to accelerate the economic development of society in principle. In the modern economy, e-commerce technologies are giving a new qualitative character to the development of the economy due to the growing role of exchange and distribution processes in the reproduction cycle.

During a pandemic, e-commerce has certain characteristics. In this case, the main feature of e-commerce, based on the application of the latest information and telecommunications technologies, is the implementation of many connections between buyer and seller via the Internet. A distinctive feature of e-commerce is the combination of its

problems, which characterize the internal and external factors of the organization, including the creation of a favorable market environment for the organization. This allows e-business to become one of the important sources of economic development. ICT provides an interactive and fast exchange of commercial information between the parties to the agreement, which in turn eliminates the misunderstandings that can occur in many cases. At the same time, there is an opportunity to postpone the implementation of a responsible decision made in advance, until they receive complete, accurate, and truthful information about the parameters of the agreement. E-business can provide new ways to solve problems in the economic environment.

6. Advantages and Functions of E-commerce

The main advantages of e-commerce in the post-coronavirus period, which have strengthened its position in the international economic space, are as follows [27, 28]:

- *Accessibility.* Any Internet user operating in one or another sector of the economy can easily connect to this network. An arbitrary enterprise can find a suitable trade and economic partner to implement a specific program of joint cooperation in the production and sale of goods via the Internet.
- *Standardization.* Internet technology creates equal opportunities for all users.
- *Fullness.* Provides a wide range of choices independently and comparatively, This expands the range of different types of goods. As a result, the consumer receives more detailed information about the goods.
- *Speed.* The instantaneous exchange of business news with modern media repeatedly saves time, which is especially valuable.
- *Self-development.* E-business participants actively create special offers for goods by compiling different and unique data banks.
- *Availability.* There are no additional costs associated with the traditional business in e-commerce. Goods offered over the Internet are usually cheaper for buyers.
- *Operationality.* Through the technologies used in Internet business, enterprises and organizations obtain a wide range of operational marketing information, including information on market prices.
- *Continuity.* Business processes can be carried out 24 hours a day by all participants without exception. This will be a determining factor in increasing the competitiveness of e-commerce in international and national markets.
- *Interactivity.* Buyers and sellers of goods can communicate and communicate with each other without intermediaries.
- *Efficiency.* Reducing the amount of paperwork related to the company's official operations through the conversion of information into digital type increases the efficiency of commercial contracts and strengthens feedback between e-market participants.
- *Coverage.* Internet business participants have the opportunity to rapidly expand the scope of their activities and access regional and other related markets.
- *Adaptation.* Internet business has unique adaptive-coordination features.

All these advantages are interrelated. However, their implementation in practice depends on many conditions, such as the structure of the information transmitted over the Internet, its technology, and so on.

With regard to the functions of e-commerce during the pandemic, as well as in the post-coronavirus period, it should be noted that the application of various new technologies in e-business processes creates certain competitive advantages in entrepreneurship. The diversity of operations ensures the advertising and movement of goods and services, the study of market conditions, e-commerce and payments, the delivery of goods and services supplied, and after-sales protection. All commercial transactions between producers and buyers of products - delivery, disclosure, and payment of invoices, including ordering, are carried out through the Internet. The functions of e-business corresponding to the stages of the commercial cycle of enterprise activity are given in Table 1.

Linking the functions of e-business to the stages of the commercial cycle not only realizes its potential but also increases efficiency through the practical use of existing concrete advantages [29]. The trade with electronic products is the transfer of all data of the commercial transaction cycle through one or another network, including the delivery of goods and services. It has become common for many companies to take over the task of processing orders and delivering them via the Internet, instead of handing them over to the distributor. Distributors also enter the virtual space with the ability to physically place goods in warehouses and track their movement via Internet technology. Buyers, sellers, and intermediaries create transnational virtual markets for goods and services on the Internet. E-commerce stimulates the quality of organizational, economic, technical, and technological supply of the firm and other participants in the trade, as well as provides further growth of activity. This is especially true when traders enter the global market.

Table 1. Main functions of e-business

№	Stages of the commodity market	Functions of e-business
1	Selection, evaluation, special management of goods and services	Selection and control function
2	Collecting, processing, and informing the market about the characteristics of the use of goods and services	Information-communication and informing function
3	Preparation of relevant information on the use of goods and services in the market	Information-communication processing and management function
4	Acceptance, processing, preparation, and fulfillment of orders for goods and services	Information processing, communication and management control function
5	Effective coordination of goods movements and warehouse stocks	Evaluation and management function
6	Fulfillment of mutual accounts between the customer and the supplier, provision of goods/services	Evaluation and communication function
7	After-sales service, evaluation, processing and presentation of results	Information and management function

It should be borne in mind that the development of e-commerce provides easy access to world markets for goods and services, breaking traditional barriers and allowing corporations to join global agreements. E-commerce is becoming more important in the intensity and quality of economic growth, becoming a key factor in business success. E-commerce is already a technical and economic means of realizing production and automating production turnover. In general, Internet technologies have given a strong impetus to the rapid development of e-business, e-commerce which is the main component of it, the Internet economy, and a virtual economy, which is a specific area of human activity have arisen. Industrialized countries have invested heavily in the Internet economy to accelerate economic and social development. Currently, the American, European and Asian sectors are growing in the e-market, which operates on the business-to-business (B2B) and business-to-consumer (B2C) models. The growth of the economy and its consistent and dynamic development depends on the scale and level of activity of companies in the e-commerce economy. Such cases have become more pronounced in the quarantine regimes used during the coronavirus pandemic. Therefore, given the limited resources, serious attention should be paid to the level of effective centralization and decentralization of their functions through the consolidation and standardization of the capabilities of e-commerce systems in all structures [30].

Therefore, the study and analysis of the infrastructure and institutional formation and pace of development of e-commerce in the new economy has become a necessary issue.

7. Scientific and Theoretical Problems of E-commerce

Extensive use of the theory and methodology of virtual business with the application of modern mathematical models and methods, the application of advanced ICT and artificial intelligence technologies on the Internet allows to effectively address both economic and serious social problems. At the same time, the implementation of the e-commerce system has caused a number of economic, organizational, and legal problems that need to be addressed urgently. The list of these processes includes ensuring the security and necessary confidentiality of transactions, weak compliance of information systems and legislation of different countries, complexity in determining the right of ownership, electronic aspects of digital, easy signature, etc. can be attributed. It should be noted that the practical application of the theory and methodology of entrepreneurship and commercial activity, developed for the traditional field of economics, as a rule, is not useful in the Internet environment [31]. Research shows that important theoretical and methodological issues related to the development of economically sound management, design, and investment issues in virtual business and e-commerce systems have not yet been fully resolved. The necessary theoretical and methodological bases for the formation of an effective e-commerce system have not yet been developed. There are no scientifically based methods for selecting the most efficient option from the alternatives of Internet companies and e-shops, as well as methods for assessing the effectiveness of virtual business. Many of the issues currently addressed in e-commerce systems are based on the use of a less complex approach to addressing economic and investment issues characterized by low economic efficiency. In fact, most of these issues are multi-purpose and require the construction of multi-criteria economic-mathematical models and the application of appropriate mathematical methods for their implementation. Proper use of them can help to achieve a synergistic effect.

Thus, it should be noted that the theoretical and methodological issues of the formation and development of the e-commerce system as a key component of e-business on the Internet are poorly developed. The study of their operation and evaluation of economic efficiency based on the use of a multi-criteria approach in this direction is an important issue. Therefore, theoretical and methodological issues related to the establishment of the working principles of the e-commerce system on the Internet, substantiation of economic efficiency of their formation, application, determination of the final results of activities, as well as the development of appropriate methods and algorithms for their implementation are quite important. The solution of these complex problems also requires the solution of many sub-problems of a modular nature:

- Clarification of the basic scientific principles of formation of e-commerce systems and their components;
- Development of a generalized structure of the Internet economy model and its inclusion in the e-commerce system;

- economic substantiation of more expedient application of different models of e-commerce;
- Classification of features of e-commerce that differ from traditional forms of trade;
- Substantiation of the composition of the main elements of the e-commerce system and analysis of their necessary features;
- Analysis of the main economic and organizational requirements for the e-commerce platform created on the Internet;
- Development of a generalized mathematical model for the selection of an effective solution plan between possible (alternative) plans on issues to be addressed in the e-commerce system as multi-purpose and multi-criteria;
- Improving information, software, and hardware of e-commerce systems.

8. Aspects of Regulating the Implementation of E-commerce in Azerbaijan

The reforms implemented in the economic system of Azerbaijan over the past twenty years can be divided into three stages. The first stage, 2003-2014 was characterized by a more than threefold increase in economic development due to the proper management of large oil revenues, state and army building, infrastructure improvement, and the formation of the middle class. The second phase, covering the years 2015-2021, is marked by the adoption and implementation of strategic roadmaps for minimizing external shocks and a new course for the economy. With the restoration of Azerbaijan's territorial integrity, the start of post-conflict, post-pandemic, and post-oil construction will be characterized by the third stage - the further implementation of a new socio-economic development strategy based on five national priorities for 2022-2026 and beyond.

The goal is to achieve an average annual real growth of more than 3% of GDP by 2025. In 2021, real GDP growth in the country was more than 5 percent, including non-oil GDP growth of 7.2 percent. In 2022, economic growth is projected at 3.9 percent. Also, the fact that exports in the non-oil sector will increase from \$ 170 per capita in 2015 to \$ 270 in 2021, means that the target of \$ 450 in 2025 can be achieved. While the forecast for world trade growth in 2021 is 10.8 percent, Azerbaijan's non-oil exports increased by 47.2 percent.

The economic reforms implemented in the country have been repeatedly welcomed globally as a conceptual and functional model. It is no coincidence that the Organization for Economic Co-operation and Development (OECD) (<https://www.oecd.org>) has presented the "Economic Reform Management Model" implemented in Azerbaijan on its official platform as an exemplary innovative practice on a global scale (Gasimli V. On economic reforms. <https://azertag.az/xeber/V.Qasimli>, 14.01.2022).

Azerbaijan's economy will grow in an environment that will be affected by various changes in the coming decades, which will be considered during the post-coronavirus pandemic. It is important to cope with the challenges of such influences and to take advantage of them. In particular, significant impacts of technological innovation and frequently changing oil and gas prices are expected to be more important. At the same time, other processes in the global economy, and complex external economic environment factors can affect the macroeconomic stability of the country. Such cases require increasing attention to innovative areas of building the development potential of e-commerce systems. The scope of new technologies/services in this area needs to be significantly expanded. Digitization of many relevant economic and social processes must be achieved. It should create conditions for the improvement of e-commerce systems, their further development in the private sector, and their effective management. Appropriate reforms to regulate e-commerce systems should be continued.

The legal basis for e-commerce is mainly regulated by the laws on e-commerce and e-signatures. The Law of the Republic of Azerbaijan "On e-commerce" defines the legal basis for the organization and implementation of e-commerce, the rights and obligations of its participants, as well as the responsibility for violation of the legislation on e-commerce.

In here different concepts and categories with specific content such as:

- 1) activities carried out on purchase and sale of goods, rendering of services, and performance of works using electronic trade-information systems;
- 2) participants of e-commerce - legal entities and individuals acting as sellers (suppliers), buyers (customers), and intermediaries of electronic document circulation in the implementation of e-commerce;
- 3) seller (supplier) - an e-commerce participant selling goods (rendering services, performing works);
- 4) buyer (customer) - an e-commerce participant who receives goods (orders services, works);
- 5) electronic document circulation intermediary - a natural or legal person providing electronic document circulation services between the sender and recipient of an electronic document, etc. The scope of this law applies to e-commerce in all other areas of the country, except for the financial market, including insurance and securities markets.

Legal regulation of e-commerce is based on the following principles:

- 1) equality of rights of participants;
- 2) freedom of will of the participants;
- 3) property independence of participants;
- 4) inviolability of property;

- 5) freedom of contract;
- 6) unimpeded implementation of entrepreneurial activity;
- 7) free and fair competition;
- 8) free movement of goods, services, and financial resources;

9) ensuring the protection of rights in court. As a rule, e-commerce does not require a special permit (license). In the case of e-commerce in areas of activity requiring a special permit (license), the seller (supplier) must obtain a special permit (license) for that activity in the manner prescribed by law. In e-commerce, contracts between the seller (supplier) and the buyer (customer) are concluded in the form of an electronic document.

E-commerce in the Internet space is as wide and comprehensive as traditional entrepreneurship. The main reason for the emergence of e-commerce, as well as its characteristics and advantages, is, of course, the reduction of transaction costs of production. However, the goal is not just to reduce transaction costs. The main issue is to achieve economic benefits by reducing the cost of the final product, and the use of new technologies in the development of new, more efficient products with high consumer value. Reducing prices, expanding the market, and strengthening competition are important conditions. E-commerce technology allows you to create the best ways to do business. It has a positive macroeconomic impact on the modern system of international relations. E-commerce is concerned with the international division of labor, the international movement of capital, labor migration, and so on. has a fairly large impact.

As it is known, the management of economic and business processes on the basis of modern ICT has national and regional features, although it is a global phenomenon, both conceptually and in terms of application. The impact of e-business and e-commerce on the development of the economy already covers all areas of society. Relevant measures are being taken in Azerbaijan to establish a "Digital Trade Hub" portal and strengthen the country's position as a "Digital Trade Hub" [32] and expand foreign trade operations. In addition, the fact that Azerbaijan is one of the first countries in the Asia-Pacific in terms of cross-border trade makes a positive contribution to further improving the country's position in the global arena. By the way, according to the United Nations Global Report on Facilitation of Digital and Sustainable Trade for 2021 [33], Azerbaijan leads the region in Southern and Eastern Europe, the Caucasus, and Central Asia, gaining 86% according to certain criteria. Compared to 2019, the transparency indicator in 2021 increased by 7% and achieved maximum results.

Azerbaijan has made significant progress on the report's cross-border paperless trade indicator, an increase of 33%. The report compares the current situation in the country with previous years and provides detailed information on the reforms that led to these improvements. The average performance of trade facilitation measures in the world (transparency, formality, institutional regulation, and cooperation, paperless trade, borderless, paperless trade) can be given in Figure 1.

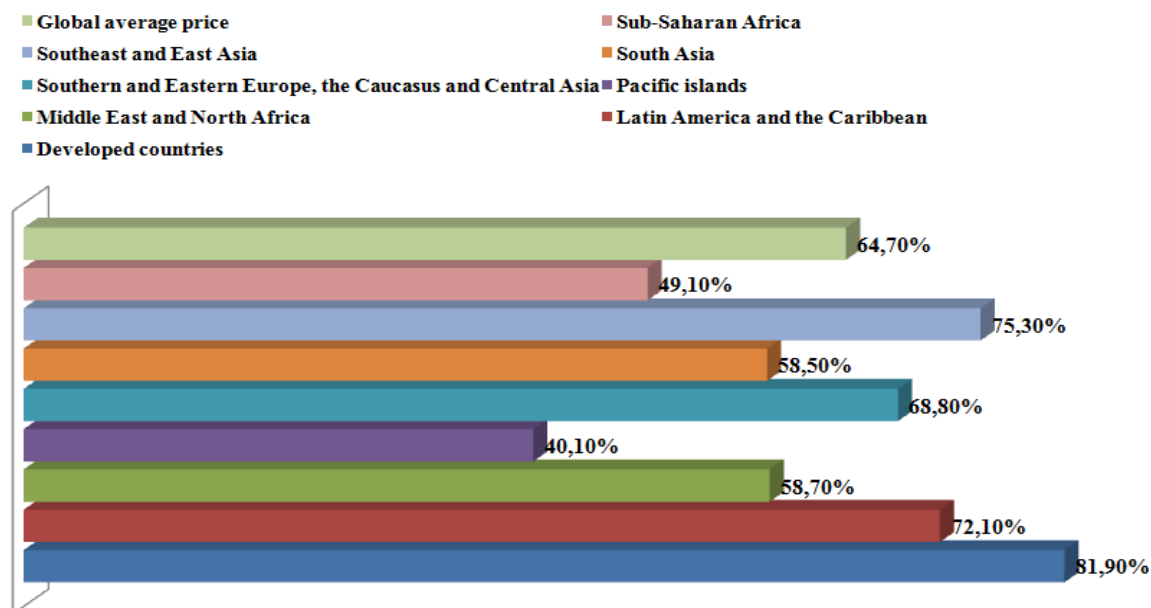


Fig. 1. Average indicators of implementation measures to facilitate trade in the world (compiled by the author [33] on the basis of the report) **Source:** [33] The UN Global Survey on Digital and Sustainable Trade Facilitation, 2021.

The development of the New Computerized Transit System covers the European Union, the European Free Trade Association (Switzerland, Liechtenstein, Norway, and Iceland), Turkey, Northern Macedonia, and Serbia. The system is an electronic declaration and a processing system and it also provides transit declarations. For transit traffic between States Parties, this system provides a single procedure from the beginning of transportation to the final destination, with

electronic coordination of all customs authorities. Other countries interested in participating in the transit system include Albania, Azerbaijan, Bosnia and Herzegovina, Georgia, the Republic of Moldova, and Ukraine [33].

9. Application of New Technologies in Improving the Functioning of Modern E-commerce Systems

Today, society is experiencing a period of 4.0 Industrial Revolution [34, 35]. This period is characterized by the application of modern ICT, such as full digitalization with the use of modern ICT tools, cyber-physical systems in various fields, artificial intelligence, Internet of Things, big data, three-dimensional printers, robots, cloud technology. Along with the development of technology, the recent introduction of a global quarantine regime in connection with the COVID-19 pandemic and the application of various closures in many countries have led people to change their shopping habits and prefer e-commerce. Of course, the sharp increase in the number of people turning to e-commerce, in turn, has led to an increase in consumer expectations of e-commerce companies, the formation of new trends in the sector, and the tolerance of modern competition. In such a situation, the only way to continue to compete is to introduce innovations. In order to build e-commerce systems that meet modern requirements and standards and improve their performance, it is necessary to apply the latest ICT technologies (Figure 2). The most basic of these technologies are:

- *Artificial intelligence (AI)*. One of the most comprehensive areas of computer science, artificial intelligence is the study of the application of human logic to machines. The application of artificial intelligence in e-commerce allows organizations to optimize in-house operations, make better decisions, improve existing products and produce new products based on market demand analysis [36]. Currently, one of the most modern requirements for e-commerce systems is to provide an individual approach to consumers. With the use of artificial intelligence, each consumer's actions on the e-commerce system (for example, website visit times, search habits, the most preferred product types, especially at what time of the day to shop more, etc.) are recorded. This big data is then analyzed using artificial intelligence technology, and the next time a customer visits a shopping site, the content that best suits their interests is automatically presented. This ensures that these customers become regular customers. An example of the successful application of artificial intelligence in e-commerce is Alibaba's Smart Warehouse technology, a world-renowned e-commerce system [36]. According to this technology, the operation process of "Smart Warehouse" is divided into 3 separate stages: "Entering products into the warehouse", "Collecting orders from the warehouse", and "Packing orders". Because each stage has different tasks, different technologies are used to manage employees and automate processes at those stages. This classification of the implemented processes allows to automate the entry of products into the warehouse system, accelerate the process of collecting orders from the warehouse, and improve the process of packing orders [37].

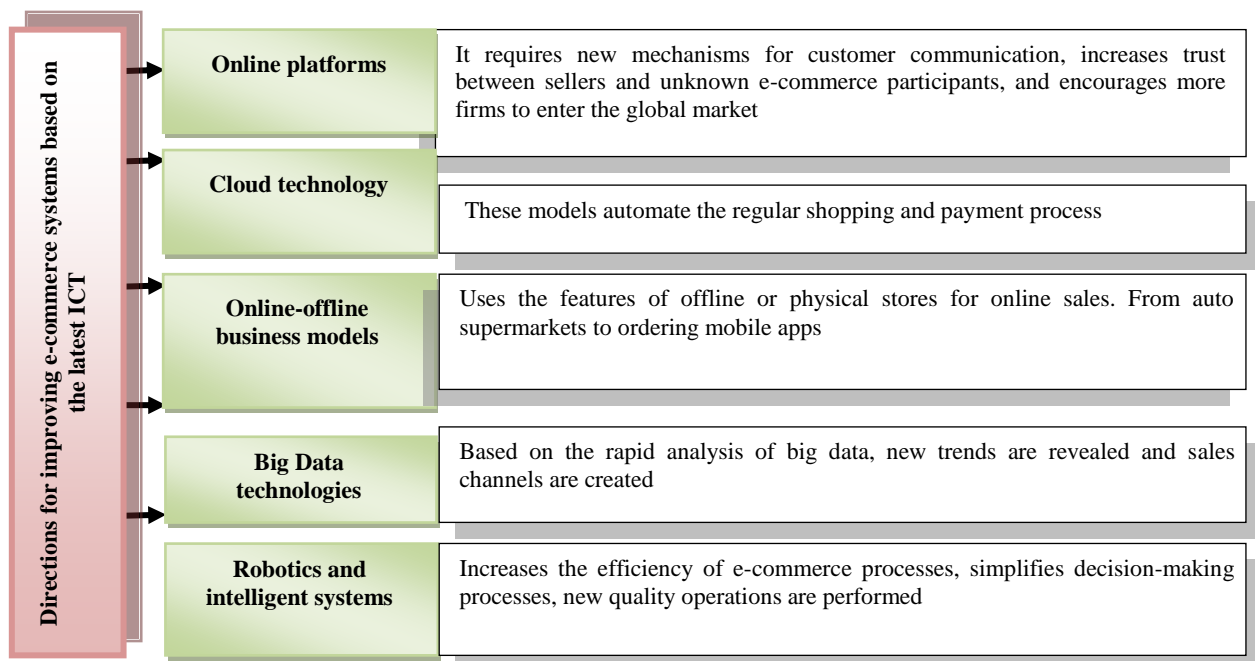


Fig. 2. Basic development technologies in the 4.0 Industrial Platform of E-commerce systems (developed by the author based on an analysis of the scientific literature)

- *Big Data*. Big data technology, which provides a high level of information support for e-commerce systems, allows businesses to track their customers, suppliers, and competitors in real-time [38]. At the same time, it allows companies to minimize marketing costs and build a user-centric marketing system [39]. The application of

big data also helps to control each customer's order model (customer ordering frequencies, permanent address where orders are delivered, purchase card where the cost of the order is paid, etc.) and to prevent illegal activities in this area.

- *Chatbots*. Chatbots, which have become one of the most important requirements for many e-commerce platforms, is one of the most widely used areas of artificial intelligence. Chatbots are software products designed to establish real-time voice or written communication with buyers in natural spoken language. They provide real-time automated answering of customer questions about any product or service and advice on product selection [40]. This allows customers to shop with confidence. The application of this technology in e-commerce also allows businesses to reduce the number of employees.
- *Internet of Things (IoT)*. IoT is a dynamically distributed environment that incorporates intelligent devices capable of understanding the processes taking place in the environment. These devices constantly monitor the external environment, collect information about the surrounding events and provide processing of this information collected by sensors in the computing system. This technology can be used to improve the logistics services of e-commerce systems. The application of tracking systems in e-commerce, which is one of the directions of IoT technology, allows companies to provide consumers with "Smart Logistics" services [21]. Due to this, customers can get real-time information about the status of their cargo through connected electronic chips and sensors. When using this technology, special labels (for example, RFID - radio frequency identification) are affixed to each ordered product. These labels mark all stages of the order delivery procedure and then transmit this information to the sensors. Thus, the customer can get real-time information about the status of the order through surveys. It should be noted that some well-known e-commerce companies that currently use this technology offer this service to users as a premium service when ordering products.
- *Augmented Reality Systems (AR)*. Relevant technologies of these systems ensure the connection of the real and virtual worlds by creating a 3D model of the object through various 3D Modeling programs [41]. Through this technology, products are displayed on the Internet showcase in the form closest to their real appearance - "live". Even some well-known companies that use this technology offer customers the opportunity to test these products virtually. One of the well-known French cosmetics brands uses ModiFace technology to scan customers' facial features and use a special program that allows them to virtually test cosmetics. The application of such AR technologies, in turn, allows attracting more customers to the e-store, preventing returns due to differences between the photo and the real product, or measurement inconsistencies.

10. Problems with the Application of the Most Modern Ict Infrastructure, Big Data, and Cloud Technologies In E-commerce Systems

One of the main problems in the application of new technologies is the problem of big data analysis. At present, the application of modern ICT technologies in e-commerce is based on the concept of big data. For example, the applied IoT technology creates a separate database by dynamically recording the status of orders, in order to provide an individual approach to customers, various information about them is recorded and analyzed through artificial intelligence, and so on.

As the amount of data collected on a daily basis in e-commerce systems increases, their use becomes more complex and costly. Thus, such a large amount of data makes it impossible to analyze them by standard programs, and since most of this data is unstructured, their collection becomes a difficult process [38]. Therefore, the acquisition of useful information - knowledge - that supports the decision-making process from big data makes it necessary to use more sophisticated analytical methods. In this regard, the application of modern technologies that provide greater memory capacity and a higher level of computing power is required to solve the problems of storage, processing, and analysis of big data.

An example of such technology is the Big Data Analytics system owned by IBM. The system uses different software platforms. One of these platforms is Watson Analytics. The platform provides data retrieval, automatic forecasting based on available data, and the creation of infographics on the control panel. The use of such infographics can be of great benefit to e-commerce companies in identifying successful operations and marketing strategies.

Another key issue is the problem of creating the necessary ICT infrastructure. Today, the development of the latest ICT-based e-commerce enterprises depends on the level of application of ICT: 1) in improving the products and services provided, 2) in workflow management, 3) in the decision-making process, 4) in the implementation of computational operations of the enterprise, etc. In particular, small and medium-sized enterprises face challenges in building the necessary technical infrastructure in the process of creating e-commerce platforms [42]. Because the creation of such an infrastructure is a very expensive operation for small and medium-sized businesses.

Some of these problems can be solved by using Cloud Computing technology. Cloud technologies enable the virtual creation and use of ICT infrastructure and software in a direct network environment. Cloud technology allows server computers located in enterprises to transfer memory systems and software resources to the cloud, ie allow them to be grouped together [42]. With the help of cloud technology, all the data of the enterprise is stored in cloud systems, processed and the processing results are reviewed. The application of this technology allows enterprises to save on the cost of building IT infrastructure, to ensure constant access to data, to manage the flow of information within the

enterprise and to control the operation of the established system. It should be noted that cloud technologies are also widely used in solving the above-mentioned problems that require large computing and memory resources.

11. Conclusion

The role of the ICT factor in the formation of the information and knowledge economy during the post-coronavirus pandemic is growing. The development of ICT provides accessibility of information and new means of communication, organization of production processes, and increases the efficiency of many economic activities. Information and communication systems accelerate the globalization of the economy by connecting to international markets and global production networks. With the development of ICT, a knowledge-based innovation-oriented economy is being built in the region. Through ICT, the country's intellectual potential will be strengthened by ensuring sustainable and sustainable development, e-business will be further developed, and poverty and unemployment will be reduced. Ensuring the transition to the information society requires the development of electronic services, as well as the full satisfaction of the existing demand for information products and services.

With the introduction and effective use of e-commerce systems, the following can be done: 1) the formation of a sustainable economic system will be strengthened; 2) the creation of a network of social and market infrastructure will be accelerated; 3) develop traditional production areas; 4) increase export opportunities; 5) new competitive production areas will be created; 6) incentive mechanisms are applied; 7) further development of public-private sector investment cooperation, etc.

Studies show that during the post-coronavirus pandemic, the formation of the information and digital economy is developing more rapidly on the basis of e-business, e-commerce, and digital technologies, which will form the basis of the new economy. Society is at the stage of effective development based on technology-oriented knowledge, highly qualified specialists, advanced science, an education system, and improving the welfare of the population. The modern development of the information and digital economy requires the widespread use of e-commerce technologies and systems that reflect the main economic processes, and the analysis and the solution to problems associated with them. The study of mechanisms and development problems of regulation of e-commerce technologies and systems, identification of development trends in this field, and development of directions for solving existing problems are considered to be topical issues of modern times. Improving the mechanisms of international, national, and regional regulation of e-commerce technologies, developing perspective development directions, substantiating the need for a single e-commerce platform, and developing directions for the formation of new business models have become urgent issues. Identifying problems in the development of modern e-commerce technologies and systems and developing solutions to them will play a special role in the development of the country's economy. Integration of e-commerce systems with new technologies such as IoT, Big Data, 3D modeling, artificial intelligence, etc. is one of the important directions in the development of e-commerce. Ensuring the integration of e-commerce systems, building an effective mechanism for e-commerce, joint application of relevant innovations with big data and other components of the 4.0 Industrial Platform are among the tools to stimulate economic growth and development. The introduction of the latest ICT technologies in the post-coronavirus era will create additional opportunities to further increase efficiency in the development of e-commerce systems in the region.

The usefulness of the obtained result and application in practice. The problems of regulating the application of e-commerce systems and prospective development directions can be applied in the development of other regional economies and in the development of solutions.

The analysis of the results of the application of e-commerce systems in the formation and development of the digital economy can serve as a platform for a comprehensive assessment of the activity of both e-commerce and other economic information systems in general. In this direction, the study of the features and application aspects of electronic commerce systems in the context of the cyber sustainable development of the digital economy reveals additional opportunities. Applications of the main development technologies of e-commerce systems in the 4.0 Industry platform to the development of other sectors of the digital economy can be applied in the regional and national economic sectors.

The application of e-commerce systems in the activities of relevant enterprises in the sectors of the digital economy creates a basis for making production, service, and management decisions.

As a result of the research, the main directions of e-commerce systems in the digital economy, problems of regulation of their application, and prospective development directions were determined. The proposed methodological approach related to e-commerce systems in the digital economy can be applied in other regional-sectoral economies. In this case, more efficient results can be achieved by applying electronic commerce systems. Implementation of electronic commerce systems implementation issues in the digital economy can be characterized as scientific support for management decisions in increasing economic and cyber stability, economic diversification issues, investments in real economic sectors, and ensuring regional technological sovereignty.

References

- [1] Emerging Priorities and Principles for Managing the Global Economic Impact of COVID-19. http://www3.weforum.org/docs/WEF_Chief_Economists_Outlook_April_2020.pdf.
- [2] Digital Economy Report. 2021. 238 p. <https://unctad.org/webflyer/digital-economy-report-2021>.
- [3] Aliyev A.G. Problemy informatizatsii obshchestva i ekonomiki. Baku, "Elm", 2003, 460 p.
- [4] World Trade Report-2021, 212 p. Published by the World Trade Organization. https://www.wto.org/english/res_e/booksp_e/wtr21_e/00_wtr21_e.pdf.
- [5] Europe E-Commerce Report-2021. 111 p. <https://ecommerce-europe.eu/wp-content/uploads/2021/09/2021-European-E-commerce-Report-LIGHT-VERSION.pdf>
- [6] Atakanova N.A., Sagynbayev S.E. Mirovoy oborot elektronnoy trgovli. Nauka i innovatsionnyye tekhnologii, 2021, №2(19), s.43-47.
- [7] Golubeva A.S., Kozyrskaya I.Ye. Rynok elektronnoy kommertsii: Mirovyeye tendentsii i Rossiyskiye realii. Ekonomika: vchera, segodnya, zavtra, 2020, T.10, №6-1, s.157-168.
- [8] Decree of the President of the Republic of Azerbaijan on Improving Governance in the Field of Digital Transformation. Baku, april 27, 2021. <https://president.az/articles/51299>.
- [9] Decree of the President of the Republic of Azerbaijan on some measures to improve governance in the field of digitalization, innovation, high technologies and communications in the Republic of Azerbaijan. Baku, october 11, 2021. <https://president.az/articles/53407>.
- [10] Aliyev A.G. Analysis of the current state of the ICT sector and prospects for its post-coronavirus pandemic. News of ANAS. Economics Series 2020, №1, pp.68-78 (in Azerbaijani).
- [11] Skovikov A.G. Tsifrovaya ekonomika. Elektronnyy biznes i elektronnyye kommertsii: uchebnoye posobiye. 2019, 260 str.
- [12] Molchanov N.N., TSzyan'fey Yan. Elektronnyye kommertsii Kitayskoy narodnoy respubliki i ispol'zovaniye instrumentov neyromarketinga v period pandemii 2020 g. Ekonomika i upravleniye, 2020, T. 26, №12(182), s.1308-1315.
- [13] Merzlyakova Ye.A., Bidskiy Ye.V. Osnovnyye tendentsii i perspektivnyye napravleniya razvitiya elektronnoy kommertsii v Rossii. TSITISE, 2021, №2(28), s.510-522.
- [14] Naumenko A.I., Shapovalova A.V. Mirovyeye trendy tsifrovoy transformatsii roznichnoy trgovli v period koronakrizisa. Sibirskaaya finansovaya shkola, 2021, №1(141), s.74-87.
- [15] Omarova KH., Damadanova M.G., Ramazanov M.G. Osnovnyye tendentsii razvitiya, strategii i novyye biznes-modeli elektronnoy kommertsii. Ekonomika i predprinimatel'stvo, 2020, №6(119), s.696-698.
- [16] Bakunovich V.D. Vliyaniye pandemii COVID-19 na elektronnyuyu kommertsiiyu. Innovatsii. Nauka. Obrazovaniye, 2021, №37, s.310-314.
- [17] Abdurafikov SH.R., Karametov R.E., Khayredinov R.E. Razvitiye rynka elektronnoy kommertsii v period pandemii koronavirusa. Informatsionno-komp'yuternyye tekhnologii v ekonomike, obrazovanii i sotsial'noy sfere, 2020, №3(29), s.112-118.
- [18] Yerokhin V.L. Elektronnyye kommertsii kak faktor postpandemicheskogo vosstanovleniya ekonomiki Kitaya. Marketing i logistika, 2021, №5(37), s.23-33.
- [19] Covid-19 and E-commerce – A Global Review. United Nations, Geneva, 2021. 151 p.
- [20] Guven H. Changes in e-commerce during the COVID-19 Pandemic crisis. Eurasian Journal of Researches in Social and Economics, 2020, vol. 7, issue 5, pp. 251-268 (in Turkish).
- [21] Aisha M., Khaled S. The Future of e-commerce systems: 2030 and Beyond. In book: Recent Advances in technology acceptance models and theories. 2021, pp.311-330.
- [22] Joma H.Norian, Abdelazez M. J., Mohammed H. E., Ali A.A. Data-driven e-commerce techniques and challenges in the era of the Fourth Industrial Revolution. Scientific Journal of Informatics, 2020, vol.7, No. 2, pp.291-30.
- [23] Madhusmita C., I.G.Srikanth. A comparative study on "E-commerce verses M-commerce: The future of online marketing". National Research Journal of Sales & Marketing Management, 2014, volume-issue-2, pp.1-13.
- [24] Bondarenko A.V., Yevgrafova O.V., Kozhankov A.YU., Vakhrushev V.YU. Problemy i perspektivy regulirovaniya elektronnoy kommertsii v YEAES. Mezhdunarodnaya ekonomika, 2021, №10, s.732-742
- [25] Boykova A.V. Razvitiye elektronnoy trgovli v usloviyakh pandemii COVID-19. Vestnik Altayskoy Akademii ekonomiki i prava, 2021, №4-1, s.30-34.
- [26] Vikas S., Madhup K.G. Internet of Things (IoT) on E-commerce logistics: A Review. ICACSE-2020. Journal of Physics: Conference Series. IOP Publishing. 1964 (2021) 062113. doi:10.1088/1742-6596/1964/6/062113
- [27] Revinova S.Yu., Ivashchenko E.A. E-commerce in China amid COVID-19 pandemic restrictions. RUDN Journal of Economics, 2021, vol. 29, No.4, pp.699-715.
- [28] Aliyev A.G. Teoretiko-prikladnyye aspekty informatizatsii gumanitarnykh otrasley. Baku, "ELM", 2006 g., 474 str.
- [29] Dreyzis YU.I., Vershinina G.N. Analiz effektivnosti instrumentariya i sredstv avtomatizatsii dlya elektronnoy kommertsii. Vestnik Akademii Znaniy, 2019, №3(32), s. 97-104.
- [30] Winwin Y.M. The role of information technology in e-commerce. International Journal of Scientific & Technology Research, 2019, volume 8, issue 1, pp.173-176.
- [31] Levchenko V.O., Nikishov V.N. Matematicheskaya model' elektronnoy kommertsii Matematika, ekonomika i upravleniye, 2015, T.1, №3, s.80-83.
- [32] Decree of the President of the Republic of Azerbaijan on Digital Trade Hub. Baku, February 23, 2017. <https://president.az/az/articles/view/22892>
- [33] Digital and Sustainable Trade Facilitation: Global Report 2021. United Nations. 73 p. <https://www.unescap.org/kp/2022/untf-survey-2021-global>
- [34] Schwab K. The Fourth Industrial Revolution. Limited, 2017, 192 p.

- [35] Kondrashova Ye.A., Brovar' N.A. Elektronnaya trgovlya kak indikator razvitiya tsifrovoy ekonomiki. Sbornik nauchnykh rabot serii "Finansy, uchët, audit", 2019, №2(14), s.110-119.
- [36] Zhang D., Pee L.G., Cui L. "Artificial intelligence in e-commerce fulfillment: A case study of resource orchestration at Alibaba's Smart Warehouse". International Journal of Information Management, 2021, volume 57, pp.102-304.
- [37] Kostin K.B., Suboch A.N. Sovremennyye biznes-modeli elektronnoy kommertsii. Voprosy innovatsionnoy ekonomiki, 2020, Tom 10, №3, str.1624-1642.
- [38] Ilieva G., Yankova T., Klisarova S. "Big Data based system model of electronic commerce", Trakia Journal of Sciences, 2015, vol. 13, suppl. 1, pp.407-413.
- [39] Yang S. Application of Big Data technology in e-commerce. 2020 International Conference on Machine Learning and Computer Application. 1682 (2020), pp.012-075.
- [40] Siddharth G., Borkar D., Chevelyn De Mello, Saurabh P. "An e-commerce website based Chatbot", International Journal of Computer Science and Information Technologies, 2015, vol. 6(2), pp.1483-1485.
- [41] Navneet G., Ankita P., Ajinkya L., Jagannath C. Evolution in e-commerce with augmented reality. RIACT 2020, IOP Conf. Series: Materials Science and Engineering. IOP Publishing, 1012(2021) 012041. doi:10.1088/1757-899X/1012/1/012041
- [42] Jignesh P. Shah, N.C.Bodiwala & Principal M.C. Role and challenges in cloud computing and e-commerce in SME's. International Multidisciplinary Research Journal, 2014, volume 1, issue 3, ISSN: 2349-7637 (Online), pp.1-4.

Author's Profile



Doctor of economic sciences Alovzat Garaja Aliyev (born January 8, 1956). Head of department of the Institute of Information Technology of Azerbaijan National Academy of Sciences. He has a total number of 270 scientific articles and 5 books. It has more than 30 scientific publications indexed in the Web of Sciences (WOS), Scopus and other international databases. Alovzat Aliyev continues to conduct scientific research works and deals with issues such as characteristics of ICT application in economical processes and management authorities, information problems in socioeconomic systems, scientific-theoretical basics of formation of information society, information economy, determination of demonstrative systems in ICT field, research of reasons of establishment of digital differences in the society, study economical basics, problems of informatization of humanitarian fields, humanitarian aspects of ICT.

Areas of interest: ICT-based information (digital) and knowledge economy, mobile, cloud, Big Data, artificial intelligence, cryptocurrency and blockchain technologies, sustainable green, inclusive and cybersecurity of economics, Industry 4.0 technologies, innovation management, e-commerce and payment systems, innovation structures, science-industrial technoparks, industrial clusters, science management and commercialization, application of digital twin technologies, smart systems and structures, cyber-sustainable green, inclusive development of the economy, including the oil industry economy, security and cyber sustainability of the non-oil industry potential, increase of the cybersecurity sustainability of information and digital economy.

For more information, please click:

<https://science.gov.az/en/institutes/145>; <https://ict.az/en/content/32/>

<https://www.facebook.com/alovsat.qaraca.aliyev>

<https://scholar.google.com/citations?pli=1&authuser=1&user=KMWGTuoAAAAJ>

How to cite this paper: Alovzat Garaja Aliyev, "Problems of Regulation and Prospective Development of E-commerce Systems in the Post-coronavirus Era", International Journal of Information Engineering and Electronic Business(IJIEEB), Vol.14, No.6, pp. 14-26, 2022. DOI:10.5815/ijieeb.2022.06.02