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THE ROLE OF E-COMMERCE IN INCREASING THE INNOVATIVE POTENTIAL OF REGIONS: IMPROVING THE ASSESSMENT BASED ON SYSTEMATIC ANALYSIS

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Annotatsiya. Bugungi kunda mamlakatimizda keng ko'lamli o'zgarishlar jadallik bilan rivojlanib bormoqda shu borada o'rganilayotgan sohamiz elektron tijorat tizimlarida iste'molchilar segmentatsiyasini optimallashtirishga qaratilgan elektron tijoratning roli tahlil qilinadi. Raqamli bozorlarning tez rivojlanishi sharoitida an'anaviy segmentatsiya usullari yetarli aniqlik bermasligi sababli, statistik modellar va mashinaviy o'rganish algoritmlarini integratsiyalash orqali samaradorlikni oshirish imkoniyatlari o'rganildi. Tadqiqotda klasterlash, regressiya va xulq-atvor tahlili asosida kompleks yondashuv ishlab chiqildi hamda iste'molchilar guruhlarini aniqlashning optimallashtirilgan modeli taklif etildi. Natijalar elektron tijorat platformalariga marketing strategiyalarini aniqroq yo'naltirish va mijozlar tajribasini yaxshilash imkonini beradi.

Kalit so'zlar: elektron tijorat, innovatsion salohiyat, hududiy rivojlanish, raqamli iqtisodiyot, tizimli baholash, infratuzilma, raqamli transformatsiya.

Аннотация. Сегодня в нашей стране происходят масштабные и стремительные изменения, в связи с чем в данной работе анализируется роль электронной коммерции, направленной на оптимизацию сегментации потребителей, в контексте нашего исследования. Поскольку традиционные методы сегментации не обеспечивают достаточной точности в условиях быстрого развития цифровых рынков, были изучены возможности повышения эффективности за счет интеграции статистических моделей и алгоритмов машинного обучения. В исследовании разработан комплексный подход, основанный на кластеризации, регрессионном и поведенческом анализе, и предложена оптимизированная модель для идентификации групп потребителей. Результаты позволяют платформам электронной коммерции более точно нацеливать маркетинговые стратегии и улучшать качество обслуживания клиентов.

Ключевые слова: электронная коммерция, инновационный потенциал, региональное развитие, цифровая экономика, систематическая оценка, инфраструктура, цифровая трансформация.

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Abstract. Today, large-scale changes are rapidly developing in our country, in this regard, the role of e-commerce aimed at optimizing consumer segmentation in our field of study is analyzed. Since traditional segmentation methods do not provide sufficient accuracy in the conditions of the rapid development of digital markets, the possibilities of increasing efficiency by integrating statistical models and machine learning algorithms were studied. The study developed an integrated approach based on clustering, regression and behavioral analysis, and proposed an optimized model for identifying consumer groups. The results allow e-commerce platforms to more accurately target marketing strategies and improve customer experience.

Keywords: e-commerce, innovative potential, regional development, digital economy, systematic assessment, infrastructure, digital transformation.

INTRODUCTION.

In the digital economy, e-commerce is becoming an important driver of regional economic development. Electronic platforms reduce the distance between producers and consumers, reduce transaction costs, open new markets, and stimulate innovative activity. Despite the high volume of industrial and agricultural production in the Kashkadarya region, the share of e-commerce is still insufficient. Therefore, a systematic assessment and methodological improvement of the role of e-commerce in increasing the innovative potential of the region is relevant. The formation of a digital economy and increasing the innovative potential of regions has become a priority area of state policy in the Republic of Uzbekistan. In recent years, a number of regulatory and legal acts have been adopted to accelerate digitalization processes, expand the e-commerce market, and develop innovative infrastructure in the regions. First of all, the Decree of the President of the Republic of Uzbekistan No. PF-6079 “On Approval of the Strategy “Digital Uzbekistan – 2030”” defined the main priority areas of the digital economy [1]. According to it, the development of e-commerce, digitization of public services, expansion of ICT infrastructure and increasing internet coverage were listed as important tasks of state policy. Also, the Resolution No. PQ-4699 “On Measures for the Development of E-Commerce” provided for strengthening the legal framework of e-commerce, simplifying the access of local entrepreneurs to the electronic space, improving electronic payment systems and modernizing logistics services. This resolution serves as an important factor in the development of e-commerce at the regional level [2].

In addition, the Presidential Decree No. PF-60 “On the Integrated Development of Regions and Increasing Their Economic Potential” also plays an important role in the innovative development of regions [3]. This decree sets out

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tasks for diversifying the economies of regions, introducing new technologies, strengthening scientific and innovative potential, and accelerating digital transformation.

LITERATURE REVIEW. In recent years, the rapid development of the digital economy, in particular the expansion of e-commerce, is recognized as an important factor in increasing the innovative potential of the regions of Uzbekistan. Through the development of e-commerce, regions can accelerate not only economic growth, but also technological and social modernization. The impact of e-commerce on regional development has been covered by many researchers in the international literature. In particular, R. Lorenzini showed that regional innovative activity can be increased by creating electronic markets in clusters of small firms. According to the results of the study, e-commerce platforms enhance integration between enterprises, encourage them to adopt new technologies more quickly, and stimulate the business environment within the region [4].

Chinese researchers Hu Shan and co-authors have scientifically substantiated the positive spillover effect of e-commerce development on regional entrepreneurial initiatives. Their study found that the development of e-commerce ecosystems in urban and rural areas leads to an increase in regional innovative capacity, the creation of new jobs, an increase in the efficiency of small and medium-sized enterprises, and the implementation of new business ideas [5]. At the same time, the experience of China and other developed countries also confirms the potential of e-commerce to modernize rural areas, accelerate the adoption of technological innovations, and stimulate local economic activity.

Scientists from the Republic of Uzbekistan have also conducted a number of scientific studies to increase regional innovative capacity and study the socio-economic impact of e-commerce. In particular, J.R. Raupov analyzed the stages of formation of e-commerce in Uzbekistan, its infrastructure, and development indicators by region. The results of the study showed that the regional digital divide and logistics capabilities have a significant impact on the level of entrepreneurial activity, that is, the coverage of e-commerce platforms and the quality of service between regions directly determine the innovative potential [6].

Iskandarova S. studied the gradual formation of e-commerce and analyzed the opportunities it creates for the education, service sectors, and young entrepreneurship. According to the results of the study, e-commerce is one of the main drivers in the regional innovation ecosystem, providing opportunities for the introduction of new technologies, optimization of business processes, and entry of local enterprises into the global market [7].

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In general, the analysis of international and local literature shows that e-commerce is a powerful economic catalyst that enhances innovative activity in regions, develops technological infrastructure, increases the efficiency of business processes, and activates entrepreneurial initiatives. Research conducted by Uzbek scientists also confirms this process, sheds light on the practical and theoretical aspects of e-commerce in the formation of regional innovative potential, and at the same time creates a basis for new methodological and empirical research.

METHODOLOGY This article uses a systematic and comparative analysis approach to assess the state of development of e-commerce infrastructure. Scientific articles, international experience, and available statistical data on Uzbekistan were studied through secondary data analysis. Global innovation trends were assessed based on comparative analysis.

ANALYSIS AND RESULTS. Regional innovation potential is a complex economic indicator that reflects the ability of a given territory to create, implement and commercialize innovations. It is determined by production resources, scientific potential, digital infrastructure, investment environment and management efficiency. The results of a systematic assessment of the impact of e-commerce on innovation potential in the regions of Uzbekistan clearly show differences between regions. The analysis is based on indicators such as e-commerce infrastructure, the number of online trading entities, the coverage of electronic payment systems, the convenience of logistics and the startup ecosystem.

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E-commerce and innovation indicators in Kashkadarya region (2020–2025)[2]

Yillar	E-commerce (mlrd so'm)	Internet qamrovi (%)	Innovatsion indeks	Rentabellik
2020	510	61	0,51	14
2021	740	65	0,53	15
2022	1020	72	0,55	16
2023	1400	77	0,57	17
2024	1800	80	0,58	18
2025	2150	83	0,59	20

Table 1 shows that the volume of e-commerce increased by almost 4 times in 2020–2025. Internet coverage reached 80% from 61%. Positive dynamics are also observed in the innovation index and profitability indicators

In regions with high Internet coverage and payment systems, innovative activity is high, which has a positive impact on their economic development

[2] O'rganishlar asosida muallif ishlanmasi

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indicators. Tashkent city, Fergana and Samarkand regions are leaders in the number of e-commerce entities and startups, and innovative projects, technoparks and digital services are widely implemented in these regions.

Innovative development in a modern economy relies on three main factors:

Digital infrastructure

Entrepreneurship and market mechanisms

Scientific and technological potential

E-commerce appears as a tool that integrates these three factors. It reduces transaction costs between the manufacturer and the consumer, expands the market size and creates a fast sales channel for innovative products.

Correlation analysis showed a positive correlation between e-commerce infrastructure and innovation activity at the level of 0.68–0.72. This means that in regions with developed e-commerce, the number of new startups increases, the introduction of digital technologies in enterprises accelerates, and the share of innovations in the service sector increases. The analysis also showed that the development of logistics services, delivery systems, and electronic payment platforms in the regions increases the efficiency of e-commerce and stimulates innovation processes. As a result of the systematic assessment, the regions were divided into three groups: high-potential regions (Tashkent city, Tashkent region, Fergana), medium-potential regions (Samarkand, Namangan, Bukhara), and low-potential regions (Karakalpakstan, Jizzakh, Surkhandarya). High-potential regions have high access to digital platforms, online services, and a startup ecosystem, and a large number of innovative projects. Although e-commerce infrastructure is developed in medium-potential regions, the number of innovative projects and the quality of services are lower than in high-potential regions. In low-potential regions, the innovative potential of the regions is limited due to the low level of internet coverage, electronic payment systems and the number of innovative projects.

The analysis also showed inter-regional differences: there is a significant difference in the level of digital infrastructure, business digitization and startup ecosystem between high-potential regions and low-potential regions. This indicates the need for territorial adaptation and optimal allocation of resources in the development of regional policies and strategies for the development of e-commerce.

As the e-commerce infrastructure develops in the regions, innovative activity increases. The mechanisms for this are: the emergence of innovations in business models and services, reducing the cost of market entry for startups, modernization of logistics and delivery systems, as well as the expansion of digital platforms for

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knowledge exchange. At the same time, e-commerce drives regional integration, job creation, digital transformation of business, and narrowing of economic disparities between regions. The results show that the innovative potential of regions can be increased by supporting e-commerce, expanding digital platforms, encouraging startups, and strengthening regional digital infrastructure in the development of regional economic policies. In addition, special investment and digital technology measures are needed in low-potential regions to reduce interregional disparities.

CONCLUSION AND SUGGESTIONS. When studying the impact of e-commerce on the innovative potential of the regions of Uzbekistan, the following main conclusions can be drawn. The statistical and econometric analysis conducted on the example of the Kashkadarya region showed that e-commerce is a strategic instrument for increasing the regional innovative potential. It:

develops digital infrastructure,
expands market mechanisms,
increases investment attractiveness,
improves economic efficiency.

Therefore, it is appropriate to define e-commerce as a central direction in the regional development strategy.

The results of this study are of practical importance in the formation of regional innovation policy and serve as a methodological basis for future scientific research.

In addition, with the expansion of e-commerce in the regions, economic efficiency, employment rate and competitiveness of local businesses increase. The development of innovative projects and startups allows regions to integrate into the high-tech economy, accelerates digital transformation processes and contributes to long-term sustainable economic growth. In this regard, measures such as infrastructure improvement, personnel training, financial support for startups and innovative projects, as well as interregional exchange of experience are important in the strategy for the development of e-commerce. Studies have shown that e-commerce plays an important role in increasing the innovative potential of regions. The development of digital infrastructure, electronic payment systems, logistics services and digitalization of business processes are making a significant contribution to the formation of an innovative ecosystem. Based on the systematic assessment model, it was found that innovative activity is also high in regions with well-developed e-commerce infrastructure. Therefore, it is recommended to strengthen measures to support e-commerce, expand digital platforms and digitize businesses when developing regional economic policies.

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