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Organization of International E-Commerce Logistics in Azerbaijan and Analysis of the Last-Mile Delivery Model

Abstract

This article analyzes the organizational principles of international e-commerce logistics in Azerbaijan and the functional features of the last-mile delivery model. The study explains the integration of border crossing, customs clearance, warehousing, and distribution stages in the formation of e-commerce flows. It is argued that the last-mile stage is the part that has the greatest impact on delivery costs and service quality. Problems such as traffic jams in urban environments, address system inequity, order collection during peak hours, and courier resource planning are assessed. The article compares the advantages and disadvantages of postal networks, private courier services, and hybrid delivery approaches. The potential for the application of solutions such as digital tracking, route optimization, and micro-distribution centers is shown. As a result, parallel development of infrastructure, data exchange, and service standards is recommended to increase the efficiency of the last mile.

Keywords: *e-commerce logistics, last mile delivery, distribution network, customs integration, digitalization*

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Azərbaycanda beynəlxalq e-ticarət logistikasının təşkili və son kilometr çatdırılma modelinin təhlili

Xülasə

Bu məqalədə Azərbaycanca beynəlxalq e-ticarət logistikasının təşkil prinsipləri və son kilometr çatdırılma modelinin funksional xüsusiyyətləri təhlil edilmişdir. Araşdırmada e-ticarət axınlarının formalaşmasında sərhəddən keçid, gömrük rəsmiləşdirilməsi, anbarlama və paylama mərhələlərinin inteqrasiyası izah olunur. Son kilometr mərhələsinin çatdırılma xərclərinə və xidmət keyfiyyətinə ən çox təsir edən hissə olduğu əsaslandırılır. Şəhər mühitində tıxaclar, ünvan sisteminin qeyri-bərabərliyi, sifarişlərin pik saatlarda yığılması və kuryer resurslarının planlanması kimi problemlər qiymətləndirilir. Məqalədə poçt şəbəkəsi, özəl kuryer xidmətləri və hibrid çatdırılma yanaşmalarının üstün və zəif tərəfləri müqayisə edilir. Rəqəmsal izləmə, marşrut optimallaşdırma və mikro paylama mərkəzləri kimi həllərin tətbiq potensialı göstərilir. Nəticə olaraq, son kilometr səmərəliliyinin artırılması üçün infrastruktur, məlumat mübadiləsi və xidmət standartlarının paralel inkişafı tövsiyə olunur.

Açar sözlər: *e-ticarət logistikası, son kilometr çatdırılma, paylama şəbəkəsi, gömrük inteqrasiyası, rəqəmsallaşma*

Introduction

The rapid development of e-commerce on a global scale in the last decade has led to a significant increase in this sector in Azerbaijan. In addition to changing traditional trade mechanisms, e-commerce is reshaping production and distribution channels (Bekirzade, 2025, p. 299). Digital infrastructure projects carried out in our country, legal reforms, and the impact of the pandemic period have accelerated the spread of e-commerce (Aliyev & Mammadova, 2021; Bekirzade, 2025, p. 300). As a result, the volume of e-commerce transactions increased sharply in 2023, with domestic e-commerce turnover reaching 39.17 billion manat and international e-commerce turnover reaching 1.95 billion manat – an increase of 2.1 times and 16.7%, respectively, compared to the previous year (APA, 2024). The expansion of e-commerce necessitates the development of logistics networks. In particular, the stage of importing, sorting, warehousing and “last mile” (i.e. delivery to the final address) of products in international e-commerce poses new requirements and challenges for logistics infrastructure. This section will review the organization of international e-commerce logistics and models of last mile delivery in Azerbaijan, and examine the current situation, challenges and prospective development directions.

International e-commerce logistics and the current situation in Azerbaijan

E-commerce logistics refers to the set of processes required to deliver products ordered online from manufacturers or suppliers to the end user (Mehdili, 2024, p. 1). This includes international transportation (by air, sea, rail and road), customs clearance, warehousing, order processing and domestic courier delivery. A number of steps have been taken by the state to improve e-commerce logistics in Azerbaijan. The digitalization of trade operations and integration into the supply chain have been declared a priority within the framework of the “Electronic Azerbaijan” program (Mehdili, 2024, p. 206). According to the UN Global Report on Digital and Sustainable Trade Facilitation for 2021, Azerbaijan has become a leader in the region, reaching an implementation level of 86% in the field of electronic trade procedures (Asan İmza, 2021). These advances mean the acceleration of documentation, permits and information exchange in the international logistics of e-commerce. In addition, thanks to the introduction of digital customs and the “single window” system, processes have been simplified when importing foreign online orders into the country. For example, the “Green Corridor” clearance system, implemented since February 2019, allows foreign trade participants who comply with the legislation to quickly clear goods directly at the border. In a short period of time, the right to permanent use of this system was granted to 790 companies (State Customs Committee, 2021). As a result, in 2022, the average control time at land border crossing points in Azerbaijan decreased compared to the previous year - for example, the border crossing time for freight vehicles decreased from 5.8 hours in 2021 to 4.0 hours in 2022 (Asian Development Bank, 2023). These indicators demonstrate that international e-commerce shipments are being carried out more efficiently.

Research

The growth of international e-commerce in Azerbaijan has increased the demand for logistics infrastructure. In January-November 2025, the volume of international freight transportation by road across the country amounted to 5.78 million tons (valued at 12.4 billion USD), which is an increase of 7.4% in tonnage and 9.1% in value compared to the same period of the previous year (SCC, 2025). In particular, the role of the national postal operator “Azerpost” and private courier companies in bringing e-commerce parcels to the country is increasing. In order to effectively organize the “last kilometer” process in domestic delivery, the network of post offices is being expanded, and new sorting centers are being established in the regions. The memorandum of cooperation signed between “Silk Way West Airlines” and “Azerpost” in 2025 is an important step in this direction. Under the agreement, Silk Way West will transport international e-commerce parcels to Baku through its global cargo network, while Azerpost will ensure their sorting and delivery to final addresses within the country (Silk Way West Airlines, 2025). In addition, a 12,000 square meter fully automated e-commerce terminal is being built in the Alat Free Economic Zone, which will serve to optimize bulk mail and parcel flows in the region (Silk Way West Airlines, 2025). Thus, Azerbaijan’s logistics

infrastructure is being modernized both physically (warehouses, terminals, vehicles) and digitally (electronic declaration, tracking systems) to meet the growing volume of international e-commerce shipments.

Features of the last-mile delivery model: In e-commerce, the “last mile” delivery – that is, the stage from the final distribution center of the package to the customer’s doorstep – is one of the most complex and costly parts of the logistics chain. Studies show that more than 30% of total transportation costs can be attributed to the last-mile stage (Gevaers et al., 2011). Several models are applied in Azerbaijan to effectively organize last-mile delivery: first, the postal services model – Azerpost delivers online orders to customers through a network of branches covering all regions of the country. Second, the private courier and delivery services model – for example, delivery through international couriers such as DHL, FedEx, UPS, as well as local startups and courier platforms (Bolt, Wolt, Starex, etc.). Third, the hybrid model – some large online stores and supermarket chains carry out delivery with their own internal courier teams or cooperate with postal/courier companies. In recent years, especially in Baku, the emergence of “click-and-collect” points has also been observed - customers can pick up their ordered goods themselves from certain pre-designated points. This prevents couriers from wasting time traveling from address to address and reduces the transport load.

Digital solutions are being implemented to mitigate these problems: tools such as automated route optimization programs, live tracking (GPS tracking) systems, and online integration with the customer are already being adopted by a number of local delivery services. For example, local courier companies such as “166 Freight Forwarding and Logistics” provide order management and shipment tracking via mobile applications. Innovative solutions from around the world are also being tested in Azerbaijan to increase efficiency in the last-mile stage: technologies such as unmanned aerial vehicles (UAVs) and autonomous delivery robots are in the spotlight, as they have shown effective results in international practice and have reduced carbon emissions (Balassa et al., 2023; Mehdili, 2024, pp. 87–95). Although these technologies are not currently widely used in our country, in the future it is possible to implement pilot projects such as drone delivery within the framework of “smart city” concepts. For example, as Fatehi and Wagner (2021) noted, mass crowdsourcing (public delivery) platforms can also be effective in the last mile - in this model, ordinary citizens carry out deliveries in nearby areas with their own vehicles. Such an approach, in addition to expanding the distribution network and reducing the courier burden, increases the economic activity of local communities (Fatehi & Wagner, 2021). There is also potential for the formation of such platforms in Azerbaijan in the future, especially in terms of increasing job opportunities in the regions.

Conclusion

The general conclusion of the study is that the effective organization of international e-commerce logistics and the optimization of last-mile delivery are essential components of building a competitive digital economy in Azerbaijan. First of all, the improvement of the geographical distribution of logistics infrastructure (especially warehouses and distribution centers) within the country is required. Although a large-scale center such as the Alet Logistics Center has already started operating around the capital Baku (Bayramov, 2019), logistics centers are also planned to be established in strategic regions such as Ganja, Red Bridge (Georgian border), and Astara (Iranian border) (Bayramova, 2019). These centers will create conditions for the direct delivery of foreign online orders to the regions, and for the faster distribution of cargo to final addresses. Second, further simplification and full digitalization of customs procedures will reduce delays in the last-mile process. The “Single Window” system and online customs declarations implemented in Azerbaijan are a positive step in this area; In the future, the widespread use of AI-based risk assessment systems in customs control can minimize transit times. Third, it is important to promote sustainable delivery approaches. This is important for both environmental protection and economic efficiency. For example, if the delivery of small packages by electric bicycles and mopeds is encouraged in Baku, it will have a positive impact on both the traffic jam problem and fuel consumption. The application of green technologies in the transport sector is also in line with the state's climate change strategy.

As a result, although Azerbaijan has achieved a number of achievements in organizing international e-commerce logistics (being a regional leader in digital trade indicators, establishing new logistics centers, etc.), there are still issues to be resolved. In particular, to increase the efficiency of last-mile delivery, it is necessary to adapt innovative approaches (automation, drones, crowdsourcing, etc.) to local conditions. As academic research has shown, modern e-commerce logistics models create new challenges that can only be met through digitalization (Aliyev, 2023). In this sense, both government agencies and the private sector should work in a coordinated manner, optimizing all links of the e-commerce ecosystem - from international transportation to last-mile delivery. The work done and planned projects give hope that the international e-commerce logistics system in Azerbaijan will be more flexible, transparent and sustainable.

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