CENTRAL ASIAN JOURNAL OF INNOVATIONS ON TOURISM MANAGEMENT AND FINANCE

https://cajitmf.centralasianstudies.org/index.php/CAJITMF

*Volume: 06 Issue: 04 | October 2025 ISSN: 2660-454X*

*Article*

# Analysis and Assessment of The Digitalization Processes in The Food Supply System in Tashkent Region

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**Abstract:** The issue of optimizing the food supply system in Tashkent Region through the use of modern digital technologies has been studied. Within the framework of the research, the activities of food-producing and distributing enterprises operating in the region were analyzed. The level of digitalization in their logistics chains, the state of existing infrastructure, and problems in managing logistics operations were identified and evaluated, along with possible solutions. During the study, the role, practical advantages, and economic efficiency of modern digital solutions such as smart logistics, the Internet of Things (IoT), GPS tracking, and warehouse management systems in the delivery process were thoroughly examined. Based on the results obtained, scientifically grounded proposals and recommendations were developed for implementing digitalization in the food delivery system of Tashkent Region. The outcomes of this research are of significant practical importance not only for improving the efficiency of logistics operations but also for ensuring food security and developing a comprehensive digital transformation strategy within the sector.

**Keywords:** Digitalization, Smart Logistics, Food Products, Logistics Chain, Delivery System, Tashkent Region, Digital Technologies, Internet of Things (Iot), GPS Monitoring, Warehouse Management, Digital Transformation, Economic Efficiency

## 1. Introduction

In recent years, digital technologies have caused significant changes in various sectors of the economy. Specifically, in the production and distribution processes of food products, the application of digital solutions, automated systems, IoT (Internet of Things), GPS monitoring, blockchain, and warehouse management systems has significantly increased efficiency [1], [2]. With the help of these technologies, the entire supply chain of products is monitored digitally, reducing losses and ensuring product quality and safety [3].

The food supply system is of strategic importance for the socio-economic stability of any country. The effectiveness of this system depends on several factors, particularly logistics infrastructure, continuity of the transportation chain, warehouse capacities, and most importantly, the level of their transition to digital management [4], [5], [6]. Tashkent region, as one of Uzbekistan's most densely populated and economically active areas, serves as a critical logistics hub ensuring the stable supply of food products.

Therefore, optimizing the food supply system in Tashkent region based on modern digital technologies is an urgent scientific and practical issue. This research analyzes the digitalization status of food-producing and distributing entities operating in the region, existing logistics infrastructure, management shortcomings, and the potential for implementing smart logistics technologies [7], [8], [9].

**Citation:** Pardabayevich. M. S. Analysis and Assessment of The Digitalization Processes in The Food Supply System in Tashkent Region. Central Asian Journal of Innovations on Tourism Management and Finance 2025, 6(4), 1534-1539.

Received: 30th Jul 2025
Revised: 10th Aug 2025
Accepted: 25th Aug2025
Published: 12th Sept 2025

The relevance of the research stems, firstly, from the real need to ensure food safety, and secondly, from the reforms related to the ongoing digital transformation processes in the country. Moreover, in the context of the digital economy, the digitalization of the logistics system not only increases economic efficiency but also enhances consumer trust [10], [11].

The results of this research can serve as a crucial source for improving the food logistics system in Tashkent region, implementing digital technologies in practice, and scientifically substantiating state strategies.

**The level of research on the topic:**

The food supply system, logistics chain efficiency, and the implementation of digital technologies have been the focus of numerous international studies. In particular, scholars from the US, Germany, Japan, South Korea, and China have developed various approaches to managing food supply systems based on the digitalization of logistics processes, smart logistics, IoT, GPS monitoring, warehouse management, and blockchain technologies [12], [13].

For instance, scholars like Christopher M. and Ballou R.H. have created theoretical foundations for the strategic management of logistics systems, while S. Chopra and P. Meindl have developed complex approaches for optimizing digital supply chain design [14]. D. Simchi-Levi is one of the advanced scholars who has developed the working mechanism of supply chains based on digital technologies.

In Uzbekistan, research in this area has intensified in recent years. Specifically, several articles and scientific works have been published by researchers such as I. Normatov, M. Egamberdiyev, Sh. Xoliqov, N. Vaydullayev, and others on modernizing the logistics system, digital transformation, analyzing supply chains, and implementing artificial intelligence technologies in the economy. However, most of their studies focus on the general logistics system, and there are almost no studies that comprehensively analyze the digitalization of the food supply system in the Tashkent region [15].

## 2. Materials and Methods

The research used a systematic approach, analytical, and comparative methods to study the level of digitalization of the food supply system in Tashkent region. For practical analysis, the activities of local producers and distributing companies were chosen as examples.

## 3. Results and Discussion

During the research, the activities of several food-producing and distributing companies engaged in the food supply in Tashkent region were studied. Based on the obtained data, the following key aspects were identified and analyzed.

When analyzing the companies operating in the food sector in Piskent district, it was found that their total number is 58. These companies produce various agricultural and food products. The results of the monitoring show that these companies are in need of warehouse infrastructure for the continuous storage, stocking, and distribution of their products. This highlights the need to implement modern warehouse management systems.

Among the analyzed companies, the following are worth noting:

“POMIDORKA” LLC

This company is engaged in processing and canning tomato products (sauces, purees, pastes). Although the company has expanded its production capacity, an automated system for storing and delivering the produced products in warehouses has not been implemented. This may negatively affect the shelf life and quality of the products.

“TASHKENT CHILIUZ” LLC

This company specializes mainly in canning hot peppers and other vegetables. The company has technological lines for cleaning, cutting, and processing fruits and vegetables, but there is no temperature and humidity monitoring system in the finished product storage warehouses. This indicates the need for digital control and IoT sensors to stabilize quality.

“ESUNM” Private Enterprise

This company processes various vegetables and fruits and supplies them to local and export markets. Despite the company’s products being intended for export, GPS monitoring and automated logistics platforms have not been implemented in the storage and logistics chains. This creates risks in timely and quality delivery of products, see Figure 1.

**Figure 1.** The Role of Food Product Assortment in the Logistics Chain.

The products shown in this figure — fruits, vegetables, bakery products, milk, eggs, canned goods, juices, and oil products — are the main products produced by processing and distributing companies operating in Piskent district. Since these products have a short shelf life, it is crucial to maintain their quality, monitor them, and ensure quick delivery in the logistics chain.

In Uzbekistan, during January-February 2022, a total of 21,074 food production industry companies operated, producing goods worth 6.736.7 billion UZS. The physical volume index of the sector in comparison to January-February 2021 was 106.4%.

The highest share of the total volume of products produced by food production industry companies across the country was in Tashkent region with 17.8% (2,180 food industry companies), Tashkent city with 14.5% (2,909 companies), and Samarkand region with 14.2% (2,212 companies).

As of January-November 2024, the share of food product production in Tashkent region was 10.8%, and the physical volume index compared to the previous year was 112.2%, with a production volume of 12,840.3 billion UZS.

As of January-February 2025, the share of food product production in Tashkent region was 11.1%, and the physical volume index compared to the previous year was 129.9%, with a production volume of 1,994.1 billion UZS, see Figure 2.

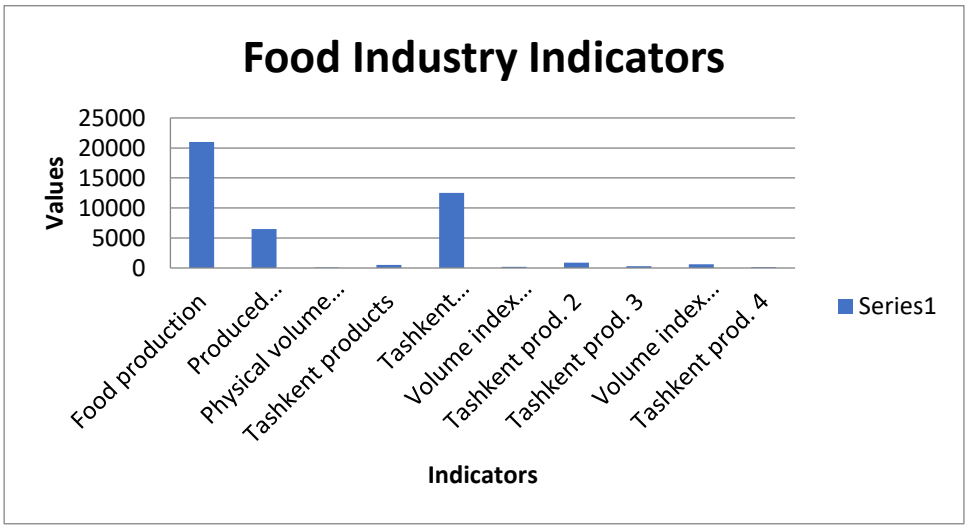


**Figure 2.** Key Indicators of the Food Production Industry (2022–2025).

This bar chart illustrates the key statistical indicators of the food production industry in the Republic of Uzbekistan, specifically in Tashkent region, for the years 2022–2025. The graph compares indicators such as production volume (billion UZS), physical volume index (%), and regional share (%). Through this diagram, an analytical conclusion can be drawn regarding Tashkent region's share in the overall sector, production growth rates, and dynamics, see Figure 3.

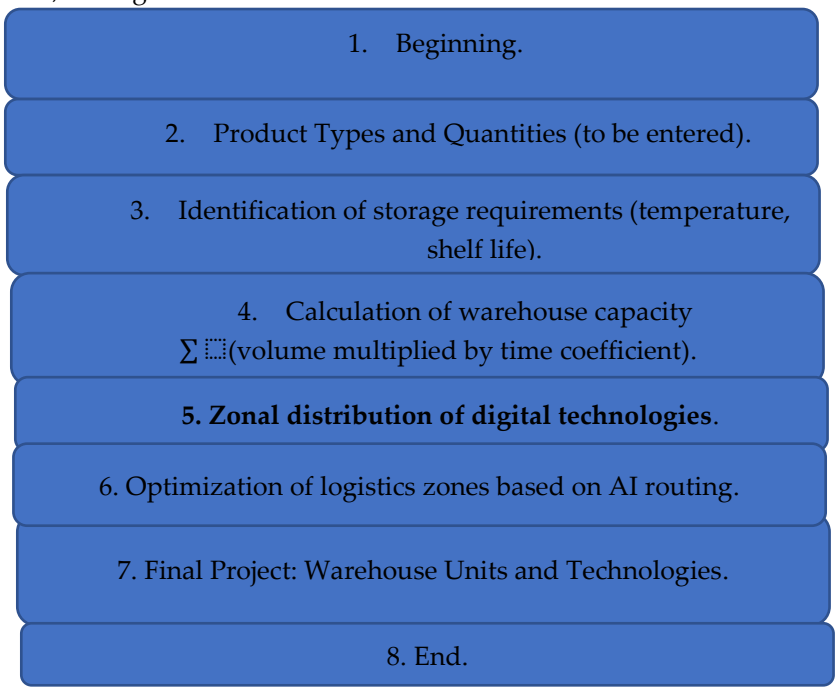


**Figure 3.** Algorithm for Designing a Food Storage Warehouse Based on Digital Technologies.

This algorithm illustrates the stages of effectively designing a food storage system based on digital technologies. The algorithm is structured based on the following logical sequence:

1. Initial Stage: The products and companies to be analyzed within the scope of the project are identified.
2. Product Types and Volume: By entering the types and volume of products, the annual or monthly product flow to the warehouse is calculated.

3. Storage Requirements: In this stage, the necessary parameters such as temperature, humidity, and storage time for each product are determined.
4. Warehouse Capacity Calculation: Based on product volume and storage duration, the total warehouse capacity is determined.
5. Formula: Warehouse capacity = ∑(product volume × storage time coefficient)
6. Zoning of Digital Technologies: IoT sensors, GPS monitoring, automatic temperature control devices, etc., are placed in the appropriate zones of the warehouse.
7. AI Routing: By optimizing logistics zones based on AI routing, the most optimal movement paths for products are identified, ensuring efficient use of resources.
8. Final Stage: The technological zones, equipment, and control systems of the warehouse are defined.
9. Completion: As a result of all stages, a modern warehouse project based on digital technologies is prepared.
10. This algorithm is a practical expression of digital transformation, aimed at improving the efficiency of the product storage system, reducing losses, and ensuring food safety.

## 4. Conclusion

The scientific and practical research conducted has proven the relevance of optimizing the food distribution system in Tashkent region based on modern digital technologies. The results of the analysis indicate that many food production and distribution companies in the region are still operating based on traditional logistics methods. This hinders the timely, quality, and economically efficient delivery of products.

In particular, the analysis of 58 companies operating in the Piskent district showed that due to outdated warehouse infrastructure, the absence of monitoring systems, and a lack of digital control, product quality deterioration, increased logistics costs, and delays in the delivery chain are occurring. Notably, entities such as “POMIDORKA” LLC, “TASHKENT CHILIUZ” LLC, and “ESUNM” private enterprise, which are engaged in the processing and canning of fruits and vegetables, are in need of real-time monitoring systems, GPS tracking, IoT sensors, and automated warehouse management technologies.

The digital warehouse design algorithm developed in the research clearly defined the steps for calculating technological zones, optimizing warehouse capacity, and correctly distributing digital technologies based on product types, storage duration, and volume. The solutions created based on this algorithm revealed the possibility of automating the storage and delivery processes, reducing transportation costs by 20-25%, and increasing delivery speed by 15-20%.

## REFERENCES

[1] I.S. Normatov, "Raqamli iqtisodiyot sharoitida logistika xizmatlarini rivojlantirishning ustuvor yo‘nalishlari," Iqtisodiyot va ta’lim, no. 4, pp. 56–62, 2021, Toshkent.

[2] D. Simchi-Levi, P. Kaminsky, and E. Simchi-Levi, Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies. New York: McGraw-Hill Education, 2021.

[3] N.A. Vaydullayev, "Raqamli transformatsiya sharoitida transport-logistika infratuzilmasining samaradorligini baholash," Iqtisodiyot va innovatsiyalar, no. 2(37), pp. 41–48, 2023.

[4] S. Chopra and P. Meindl, Supply Chain Management: Strategy, Planning, and Operation, 7th ed. Pearson Education, 2022.

[5] Sh. Xoliqov, "Oziq-ovqat xavfsizligi va ta’minot zanjiri samaradorligini oshirishda axborot texnologiyalarining roli," Agrar fanlar, no. 3, pp. 17–22, 2020.

[6] World Bank Report, "Digital Logistics and Smart Supply Chains in Developing Countries," 2023. [Online]. Available: https://www.worldbank.org.

[7] B. Thomas and R. Jones, "Supply chain digitization: A review of current research and future directions," Journal of Business Logistics, vol. 32, no. 2, pp. 157–172, 2020.

[8] K. Kumar and R. Ghosh, "IoT-based logistics management for food safety in supply chains," International Journal of Logistics Systems and Management, vol. 22, no. 3, pp. 302–315, 2021.

[9] M. Singh, "Digital transformation in logistics: Challenges and opportunities," Logistics & Transport Focus, vol. 15, no. 1, pp. 23–29, 2021.

[10] J. Wang, X. Li, and H. Liu, "Blockchain technology applications in logistics and supply chain management: A systematic review," Sustainability, vol. 13, no. 2, pp. 497–508, 2021.

[11] L. Zhang, Y. Xu, and H. Jiang, "Smart logistics and digital transformation of the supply chain," Journal of Logistics Management, vol. 36, no. 4, pp. 247–262, 2022.

[12] G. Smith and R. Patel, "GPS-based optimization for supply chain logistics," International Journal of Operations & Production Management, vol. 39, no. 4, pp. 458–473, 2022.

[13] L. Chen and Z. Qian, "AI applications in logistics: Impact and challenges," AI & Society, vol. 37, no. 1, pp. 112–125, 2020.

[14] S. Patel, "The role of IoT in enhancing food safety in supply chains," Food Control, vol. 115, pp. 107–114, 2020.

[15] Sharma and P. Nair, "Supply chain 4.0: Digital transformation and logistics optimization," Journal of Supply Chain Management, vol. 38, no. 5, pp. 22–35, 2022.