DIGITALIZATION OF FOREIGN TRADE: ESSENCE AND FEATURES OF MODERN INTERNATIONAL TRADE PROCESSES

Tyan Qinxue
Master's degree student of TSUOS
https://doi.org/10.5281/zenodo.18054386

ARTICLE INFO

Received: 23rd December 2025
Accepted: 24th December 2025
Online: 25th December 2025

KEYWORDS

digital trade, foreign trade digitalization, e-commerce, Big Data, artificial intelligence, international trade

ABSTRACT

The article examines the essence and key features of foreign trade digitalization as a new paradigm of international trade. It analyzes the impact of digital technologies on trade processes, logistics, market access, and institutional frameworks. Special attention is given to opportunities for small and medium-sized enterprises, as well as challenges related to infrastructure, regulation, and cybersecurity.

Introduction

In recent decades, international trade has undergone significant transformations under the influence of digital technologies. The emergence and spread of Internet platforms, electronic document management systems, cloud services, Big Data technologies, artificial intelligence (AI), blockchain, and other innovations have changed the traditional logic of export–import operations, making them more flexible, faster, and more accessible. This process — the digitalization of foreign trade (digital trade) — acts as a new paradigm of international trade, reflecting not only technological but also institutional and economic changes: digital platforms replace part of the intermediary functions, costs are reduced, and opportunities expand even for small and medium-sized enterprises (SMEs)[1].

Main part

Global trade is increasingly influenced by digital technologies that transform traditional export–import operations. Digitalization changes not only technical procedures but also the institutional foundations of international trade.

Initially, international trade was based on paper documents, physical contracts, customs declarations, and lengthy document circulation. With the development of information and communication technologies (ICT), infrastructure for electronic data exchange began to form, which made it possible to gradually move to EDI (Electronic Data Interchange) systems, electronic certificates, digital contracts and declarations, as well as automated systems of customs clearance and logistics management (OECD)[2].

Further, with the spread of the Internet, cloud services, and mobile communications, global e-commerce and trade platforms emerged, allowing sellers and buyers to interact directly, bypassing traditional intermediary structures. This changed the very nature of trade — from the model "goods → border → merchant → consumer" to "platform → digital order → logistics → consumer" (UNCTAD).

[1] https://www.oecd.org/en/topics/digital-trade
[2] https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures

Finally, modern technologies (AI, Big Data, IoT, blockchain) make it possible not only to digitalize classical processes but also to make them "smart": to forecast demand, optimize delivery routes, automate customs and logistics operations, analyze risks, and manage supply chains in real time. These technologies create the basis for a new architecture of international trade — digital, flexible, and adaptive[3].

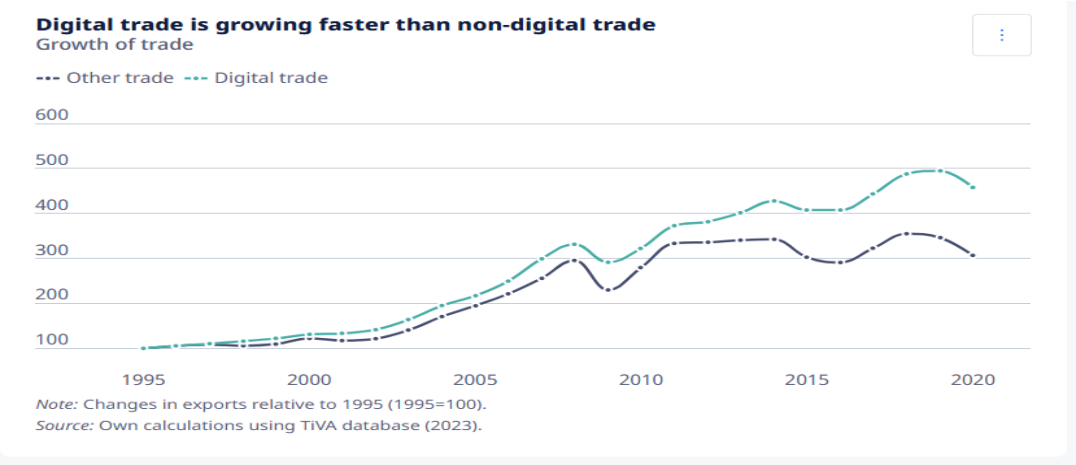

Figure 1.1.1. Growth Rates of Digital Trade

Measuring digital trade is a complex task; however, international efforts are being made to improve its reflection in trade statistics. At the same time, indirect indicators help to assess its scale and dynamics. These estimates already show that in 2020 digital trade accounted for about 25% of world trade, which is equivalent to almost USD 5 trillion[4].

Table 1

Comparison of Traditional and Digital Models of Foreign Trade

Aspect	Traditional model of foreign trade	Digital model of foreign trade	Notes / effect of digitalization
Document flow	Paper documents, manual contract and declaration processing	Electronic contracts, digital certificates, automated declarations	Reduction of processing time, fewer errors, higher transparency
Intermediaries	Mandatory brokers, agents, customs representatives	Minimization of intermediaries via B2B and B2C platforms	Reduction of transaction costs
Market access	Geographically and financially limited	Expanded access for SMEs via global platforms	Equal opportunities
Logistics and tracking	Manual route planning	Intelligent logistics, real-time tracking	Cost reduction, optimization
Analytics and forecasting	Limited, retrospective analysis	Big Data, AI, real-time analytics	Better decision-making

[3] https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures
[44] https://www.oecd.org/en/topics/digital-trade

Regulation and standards	National standards, paper certificates	Recognition of e-documents, digital standards	Faster procedures
Security	Physical document protection	Cybersecurity, data protection	New security requirements

Source: compiled by the author based on https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures; https://itif.org/publications/2023/05/08/transforming-global-trade-and-development-with-digital-technologies

Under globalization conditions, traditional foreign trade with paper-based document flow and manual logistics is gradually being replaced by digital systems using AI and innovative technologies, which increases efficiency, transparency, and access to global markets. Digitalization enables process automation, reduction of transaction costs, expansion of SME access to global markets, and improvement of transparency and security of operations.

The use of innovations such as Big Data, distributed ledger technologies (including blockchain), the Internet of Things (IoT), cloud computing, and artificial intelligence algorithms opens new opportunities for managing foreign trade operations. Studies devoted to ICT in foreign trade emphasize that these technologies ensure transaction transparency, reduce transaction costs, accelerate logistics, and improve interaction between exporters, importers, customs, and logistics services[5]

An important component of digitalization is the reduction of barriers to entering foreign markets, especially for SMEs. According to UNCTAD materials, digital technologies and platforms help reduce costs, facilitate access to foreign markets, and stimulate export activity of companies[6].

Thus, digitalization of foreign trade acts as a new institutional and technological format that changes the nature of international trade — making it more flexible, faster, and less dependent on traditional administrative restrictions, which is especially important under growing global competition.

The use of innovative technologies and artificial intelligence significantly simplifies a number of operations necessary for trade between countries:

- **Reduction of transaction costs and time**. Electronic document flow, automated declarations, digital contracts, and e-commerce platforms shorten processing time and reduce administrative and logistics costs[7].
- **Expansion of access to foreign markets for SMEs**. Digital platforms allow small companies to participate in international trade, which was previously available mainly to large corporations[8].

[5] Гриднева А.О., Васильевский А.Б. СОВРЕМЕННЫЕ ТЕХНОЛОГИИ ВО ВНЕШНЕЭКОНОМИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ: ЦИФРОВИЗАЦИЯ // Вестник науки №12 (81) том 4. С. 140 - 147. 2024 г. ISSN 2712-8849 // Электронный ресурс: https://www.вестник-науки.рф/article/20024 (дата обращения: 02.12.2025 г.)
[6] https://unctad.org/system/files/official-document/tdb66_d5_ru.pdf
[7] https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures
[8] Mirzaye, S.; Mohiuddin, M. Digital Transformation in International Trade: Opportunities, Challenges, and Policy Implications. J. Risk Financial Manag. **2025**, 18, 421. https://doi.org/10.3390/jrfm18080421

- **Improved transparency and control of supply chains**. Digital systems and analytics enable logistics monitoring, cargo tracking, risk assessment, and demand forecasting[9].
- **Flexibility and adaptability to external shocks**. During crises such as pandemics or logistics disruptions, digital solutions enable faster adaptation of routes and contracts[10].

These advantages make digital transformation a key driver of modern foreign trade development.

The development of digital trade is not spontaneous; it is ensured through international cooperation, standardization, and regulatory frameworks. Among the key actors:

- **UNCTAD** promotes paperless and digital trade, emphasizing cost reduction and SME inclusion[11].
- **OECD** analyzes digital trade effects, linking digital connectivity with lower trade costs and higher trade volumes[12].
- International analytical institutions highlight that ICT, platforms, AI, and blockchain can transform global trade, provided adequate institutional readiness.

At the same time, digitalization creates new challenges. Key challenges include[13]:

- Uneven digital infrastructure development.
- Regulatory and institutional barriers.
- Cybersecurity and data protection risks.
- Unequal distribution of digitalization benefits.

These challenges show that digital transformation of foreign trade is a complex, multi-dimensional process requiring technological, institutional, and regulatory solutions.

Conclusion

Digitalization of foreign trade represents a systemic transformation of international trade processes. Digitalization of foreign trade is not merely the adoption of new technologies but a fundamental transformation of international trade architecture. While it offers cost reduction, speed, flexibility, and broader market access, it also requires coordinated policies, infrastructure development, and international cooperation. Successful digital trade development depends on infrastructure readiness, regulatory harmonization, and institutional cooperation.

.

References:

1.OECD. Digital trade. Available at: https://www.oecd.org/en/topics/digital-trade (accessed 2 December 2025).

[9] https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures
[10] https://unctad.org/system/files/official-document/dtd2023_e.pdf
[11] https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures
[12] https://www.oecd.org/en/topics/sub-issues/opportunities-and-benefits-of-digital-trade
[1313] Mirzaye, S.; Mohiuddin, M. Digital Transformation in International Trade: Opportunities, Challenges, and Policy Implications. J. Risk Financial Manag. 2025, 18, 421. https://doi.org/10.3390/jrfm18080421; А.Худайбергенов. Особенности развития и проблемы правового регулирования электронной торговли // № Special 4 (2020): журнал правовых исследований; https://unctad.org/es/node/2873

2.OECD. Opportunities and benefits of digital trade. Available at: https://www.oecd.org/en/topics/sub-issues/opportunities-and-benefits-of-digital-trade (accessed 2 December 2025).
3.UNCTAD. Advancing digital transformation: Global insights on digitalization of trade procedures. Available at: https://unctad.org/news/advancing-digital-transformation-global-insights-digitalization-trade-procedures (accessed 2 December 2025).
4.UNCTAD. Digital Economy Report 2023. Available at: https://unctad.org/system/files/official-document/dtd2023_e.pdf (accessed 2 December 2025).
5.UNCTAD. Digitalization and trade facilitation. Trade and Development Board. Available at: https://unctad.org/system/files/official-document/tdb66_d5_ru.pdf (accessed 2 December 2025).
6.UNCTAD. E-commerce and development. Available at: https://unctad.org/es/node/2873 (accessed 2 December 2025).
7.Mirzaye, S.; Mohiuddin, M. Digital Transformation in International Trade: Opportunities, Challenges, and Policy Implications. Journal of Risk and Financial Management, 2025, 18(8), 421. https://doi.org/10.3390/jrfm18080421
8.Гриднева А.О., Васильевский А.Б. Современные технологии во внешнеэкономической деятельности: цифровизация // Вестник науки. – 2024. – № 12 (81). – Т. 4. – С. 140–147. – ISSN 2712-8849. – Электронный ресурс. – Режим доступа: https://www.вестник-науки.рф/article/20024 (дата обращения: 02.12.2025).
9.Худайбергенов А. Особенности развития и проблемы правового регулирования электронной торговли // Журнал правовых исследований. – 2020. – № Special 4.