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MODERN FEATURES OF INTERNATIONAL TRADE DEVELOPMENT IN THE CONTEXT OF DIGITALIZATION

СУЧАСНІ ОСОБЛИВОСТІ РОЗВИТКУ МІЖНАРОДНОЇ ТОРГІВЛІ В УМОВАХ ЦИФРОВІЗАЦІЇ

International trade is one of the key components of the global economy, facilitating the connection between countries and contributing to their economic growth. In today's rapidly changing world, fueled by technological advancements, digitalization has emerged as a significant catalyst for transformations in international trade. These transformations are changing how business is conducted and shaping a new architecture of economic relations between countries. It involves the simplified exchange of goods, services, capital, technologies, and other resources, overcoming the barriers created by national borders. As the digitalization of the global economy continues to accelerate and the transformations above become increasingly evident, studying the key trends in the development of international trade is highly timely and relevant. The outlined article aims to review the current features of the development of international trade in the context of digitalization.

Key words: innovations, digitalization, automation tools, trade process efficiency, international trade.

Міжнародна торгівля є однією з ключових складників глобальної економіки, що забезпечує взаємозв'язок між країнами та сприяє їх економічному зростанню. У сучасному світі, який динамічно змінюється під впливом технологічного прогресу, цифровізація стала потужним каталізатором специфічних трансформацій у міжнародній торгівлі. Ці трансформації змінюють не лише способи ведення бізнесу, але й формують нову архітектуру економічних відносин між країнами. Вона передбачає спрощений обмін товарами, послугами, капіталом, технологіями та іншими економічними ресурсами, долаючи бар'єри, створювані державними кордонами. Оскільки цифровізація глобальної економіки продовжує прискорюватися, а вищезгадані трансформації стають усе більш очевидними, дослідження основних тенденцій розвитку міжнародної торгівлі є своєчасним та актуальним. Метою цієї статті є огляд сучасних особливостей розвитку міжнародної торгівлі в умовах цифровізації. За результатами дослідження констатовано, що особливості розвитку міжнародної торгівлі в умовах цифровізації є визначальними для формування нових правил, тенденцій та механізмів функціонування світових ринків. Вони відбивають вплив цифрових технологій на міжнародну торгівлю та мають багатоаспектний характер щодо процесів обміну товарами, послугами, капіталом, технологіями та іншими економічними ресурсами через поширення електронної комерції, автоматизацію ланцюгів постачання, поширення цифрових платіжних систем, цифровізацію митного оформлення та регулювання. Доведено, що поширення електронної комерції формує нові можливості для обміну товарами та послугами через інтернет. Автоматизація ланцюгів постачання сприяє оптимізації управління процесами постачання, знижує витрати, підвищує ефективність і точність логістичних операцій. Поширення цифрових платіжних

систем забезпечує зручність, швидкість і безпеку фінансових операцій, що є критично важливим для функціонування міжнародної торгівлі. Цифровізація митного оформлення та регулювання сприяє автоматизації митних процедур, зменшує адміністративне навантаження, підвищує прозорість і мінімізує ризики корупції.

Ключові слова: інновації; цифровізація; інструменти автоматизації; ефективність торговельних процесів; міжнародна торгівля.

Statement of the problem. International trade is one of the key components of the global economy, ensuring interconnection between countries and contributing to their economic growth and development. It serves as a mechanism for resource redistribution, enabling the efficient utilization of each country's advantages in the production of goods and services.

In today's rapidly changing world, technological progress has made digitalization a key driver of fundamental changes in international trade. These transformations are changing traditional ways of business and shaping a new architecture of economic relations between countries. The new architecture involves a simplified and accelerated exchange of goods, services, capital, technologies, and other resources, overcoming physical and regulatory barriers that were previously created by national borders.

Digital platforms, automation tools, blockchain technologies, artificial intelligence, and other innovations contribute to the creation of global markets with minimal transaction costs. For example, e-commerce opens access to international markets for small and medium-sized enterprises that were previously limited to local markets only [1]. Moreover, digitalization enhances the transparency and efficiency of trade processes, simplifies customs procedures, enables more accurate demand and supply forecasting, and promotes the integration of sustainable practices into production and trade chains.

It can be stated that as the digitalization of the global economy continues to accelerate, these changes are becoming increasingly profound and irreversible. In this regard, studying the peculiarities of the impact of international trade development in the context of digitalization is highly relevant.

Analysis of recent research and publications. The issue of digital international trade has been studied by scholars such as I.A. Ostrovskyi, N.V. Mozaikin [5], I.V. Krupyak [2], O.O. Maslyhan, V.V. Hoblyk, O.H. Pustovit [4], and others. In their works, they primarily focused on the impact of international digital platforms on the development of world trade, the study of monopolistic structures created by these platforms, and the development of macroeconomic antitrust measures. In particular, many researchers emphasize that large digital platforms can gain dominant positions in markets due to their scale and technological advantages, which creates challenges for maintaining competition. At the same time, the formation of monopolistic structures in international digital platforms is more of a characteristic of their functioning, whereas the development of international trade in digitalization encompasses much broader processes.

These processes are integrated into a wide and multi-faceted system of changes occurring in international trade under the influence of digital technologies. Given this, it is crucial to study the specific features of these changes.

Formulation of the research task. The outlined article aims to review the current features of the development of international trade in the context of digitalization.

Summary of the main research material. The authors emphasize that the features of international trade development in the context of digitalization can be defined through the unique characteristics and changes occurring in international trade under the influence of digital technologies [1; 3]. New technologies define new rules, trends, and mechanisms for the functioning of global markets, which can be detailed in the following directions [1–2; 6]:

1. The spread of e-commerce is interpreted by us as the process of improving and expanding the trade of goods and services through the internet. This includes the implementation of new technologies, business models, infrastructure, and solutions to ensure fast, convenient, and secure exchanges of goods and services between companies and consumers.
2. Supply chain automation, as interpreted by us, refers to the implementation of modern technologies and tools for the automatic management, control, and optimization of all stages of the supply chain, from raw material supply to the delivery of finished products to the end consumer.
3. The spread of digital payment systems, as interpreted by us, refers to the process of implementing and expanding the use of electronic payment methods for conducting financial transactions via the Internet, mobile devices, and other digital channels.
4. Digitalization of customs clearance and regulation, as interpreted by us, refers to the process of implementing modern digital technologies to automate and simplify procedures related to customs control, goods, and services declaration, as well as the enforcement of customs regulations in international trade.

We emphasize that each of the listed features of the digitalization of international trade has a multifaceted impact on exchanging goods, services, capital, technologies, and other economic resources, and requires detailed systematic study.

So, the spread of e-commerce determines the growth of online sales volumes, as the number of transactions conducted via the internet continues to increase, thanks to the availability of mobile devices, the expansion of internet networks, and several other factors [1; 3]. In particular, the features of e-commerce development as an element of international trade in the context of digitalization are highlighted in Table 1.

The advantages of e-commerce as an element of international trade include significant cost reduction for operations, as the need for physical stores and warehouse spaces is eliminated. It allows businesses to efficiently sell products with minimal costs for maintaining physical infrastructure. Additionally, e-commerce provides customers access to a much broader range of products than traditional stores (as unlimited by the physical size of retail spaces [4]). E-commerce creates conditions for business scaling, allowing companies to quickly expand their operations beyond local markets (as it is oriented toward online platforms that provide access

Table 1

Features of the development of e-commerce as an element of international trade in the context of digitalization

Factors shaping the phenomenon of e-commerce	Components shaping the impact of the factor	Features in the exchange of goods, services, capital, technologies, and other economic resources
Technological innovations	Artificial Intelligence	Used for personalizing the customer experience (recommendations, chatbots).
	Augmented Reality	Allows customers to virtually view products before purchase (e.g., furniture or clothing).
	Mobile Commerce	Sales through mobile apps are becoming the main channel for e-commerce.
Expansion of geographical coverage	E-commerce platforms such as Amazon, Alibaba, eBay	Allow companies to enter international markets without the need for physical presence.
Convenience for consumers	Integration of e-commerce platforms with social media for advertising and making purchases	24/7 availability of stores, fast online payments, convenient home delivery or pickup points.
New business models	Focus on Direct-to-Consumer	Companies sell products directly to customers, bypassing intermediaries.
	Focus on subscriptions	Regular delivery of goods or services via a subscription model (e.g., Netflix, Dollar Shave Club).
	Focus on Marketplaces	Growth of platforms where sellers and buyers interact directly (e.g., Etsy, Rakuten).
Digital payments	Payment systems	Integration of global payment systems such as PayPal, Alipay, Stripe.
	Cryptocurrency	Growing popularity of cryptocurrencies as an alternative to traditional payment methods.

Source: compiled based on [1; 3–4]

to international consumers, reducing barriers related to geographic distance [1]). In fact, due to the combination of the outlined advantages, e-commerce provides remote access to markets that were previously considered difficult to reach due to physical distance, cultural and language barriers, or underdeveloped infrastructure.

In particular, Chinese manufacturers have rapidly expanded their presence in the global market through digital e-commerce platforms such as Alibaba, JD.com, and others, where they directly offer their products to international buyers. This reduces intermediaries' roles, lowering costs and improving trade efficiency.

American companies also actively use digital e-commerce platforms like Amazon and eBay, as well as their websites sell products in international markets. It allows them to offer a wide range of goods, from electronics to clothing and cosmetics, providing users with convenient payment and delivery methods. This approach lowers marketing expenses while also promoting sales growth in international markets.

European businesses are also actively developing online stores and forming partnerships with international e-commerce platforms such as Amazon, eBay, Etsy, and Shopify to improve access to their products in various countries. At the same time, companies within the EU can benefit from the advantages of unified regulatory standards, such as the General Data Protection Regulation (GDPR) or the EU Digital Single Market, which simplify trade procedures and reduce administrative costs for businesses [3].

Overall, e-commerce simplifies access to international markets and contributes to the globalization of economic processes, transforming traditional business models and creating new opportunities for companies from different countries [1].

Supply chain automation processes are defined by the use of various technologies and software to manage supply chains, as well as improve efficiency, reduce costs, enhance operation speed, minimize human errors, and ensure transparency at all stages [5–6]. In particular, the features of supply chain automation as an element of international trade in the context of digitalization are highlighted in Table 2.

So, the advantages of supply chain automation as an element of international trade include: reduction of logistics costs; increased speed and accuracy of logistics operations; flexibility, and scalability. Supply chain automation significantly enhances the efficiency and flexibility of international trade [5–6].

For example, one of the largest retail chains, Walmart, uses automated systems to plan delivery routes for goods to its warehouses and stores. This helps reduce logistics costs and improves the efficiency of supply chains.

Amazon actively utilizes automation in its warehouses through robotic systems that move goods, sort them, and prepare them for shipment. This approach facilitates quick handling of large product volumes while maintaining accuracy in inventory control.

Tesla leverages automated supply chains to scale its production and delivery on a global level. Automated systems enable Tesla to efficiently increase production volumes and deliveries to meet the demand for new car models.

The reduction of costs, increased speed and accuracy of logistics operations, as well as the ability to adapt to changes in demand and supply conditions, allow businesses to maintain competitiveness in the global market.

Regarding the processes of the spread of digital payment systems, they are defined by the development of

Table 2

Features of supply chain automation as an element of international trade in the context of digitalization

Factors shaping the phenomenon of supply chain automation	Components shaping the impact of the factor	Features in the exchange of goods, services, capital, technologies, and other economic resources
Use of software	Implementation of specialized software	Implementation of specialized software for monitoring, planning, and managing supply chains
	Trade operation automation programs	These programs automate processes such as procurement, inventory management, demand planning, forecasting, and tracking shipments.
Internet of Things	Sensors and devices	Use of sensors and devices to collect real-time data to continuously monitor the status of goods, reducing risks and improving inventory management.
Big Data and analytics	Processing large volumes of data for informed decision-making	Demand forecasting, supplier performance analysis, and optimization of inventory and delivery based on collected data.
Warehouse automation	Use of robotic systems	Facilitating the processes of sorting, packaging, and transporting goods in warehouses.
	Robots, drones, and automated carts	Helps in moving goods, reducing the need for human resources, and increasing accuracy.
Delivery automation	Unmanned vehicles	Use of drones for short-distance deliveries or autonomous trucks for transporting goods over longer distances.
	Robots for last-mile delivery	Well-known companies, such as Amazon, are testing delivery robots to bring products to consumers' doorsteps.
	GPS and route analytics	Programs that optimize delivery routes reduce fuel costs and shorten delivery times.
Robotic processes	Implementation of automated solutions	Implementation of automated solutions for routine administrative tasks: order processing, invoicing, reporting, payment monitoring

Source: compiled based on [3; 5–6]

technologies that allow payments for goods and services, as well as money transfers, making investments, or receiving loans without the need for physical money or traditional banking services [2–3; 5–6]. Specifically, the features of the spread of digital payment systems as an element of international trade in the context of digitalization are highlighted in Table 3.

The spread of digital payment systems is an important part of the globalization of the exchange of goods, services, capital, technologies, and other economic resources, contributing to the convenience, speed, security, and inclusivity of financial transactions.

For instance, Shopify utilizes Stripe to handle international transactions for its merchants, enabling small businesses in Europe to sell their products to customers in the US, Canada, or other countries without incurring additional banking service fees. One of the most widely used digital payment systems in the world, PayPal, allows for online purchases, transfers, and investments. It allows businesses and consumers to make international financial transactions without the need for bank accounts or cash. These examples demonstrate that digital payment systems contribute to the development of international trade by integrating with bank accounts, enabling seamless transfers between different payment platforms and banks.

Regarding the digitalization of customs clearance and regulation, it should be noted that this process significantly reduces the time and costs associated with customs operations, improves efficiency and transparency, and also contributes to combating smuggling and fraud. In particular, the features of this process as an element of international trade in the context of digitalization are highlighted in Table 4.

So, the advantages of the digitalization of customs clearance and regulation as an element of international trade include: speed and efficiency; reduction of administrative costs; decreased risk of corruption; facilitation of international trade; improved accuracy, and minimization of errors [2; 4; 6]. For example, in Singapore, the TradeNet system has been implemented, allowing businesses to submit customs declarations and documents electronically. This significantly reduces the time required for cargo processing and speeds up customs clearance procedures. In the European Union, the EU Customs Union program has been introduced, allowing customs clearance and regulation through electronic systems. This significantly reduces the administrative burden on businesses and customs authorities, lowering the costs associated with conducting procedures. In Kenya, the iTax system is used, allowing businesses to submit customs declarations online. This reduces the possibility of bribery or violations of customs regulations due to human factors, as the entire process is automated. The United Kingdom has the Customs Declaration Service (CDS), which enables the automated submission of customs declarations and allows businesses to quickly and conveniently handle customs clearance even during international shipments. In Germany, the ATLAS system allows for the automatic processing of customs declarations and real-time data accuracy checks. This significantly reduces the likelihood of errors that could occur with traditional processing methods. The digitization of customs clearance and regulation significantly changes the approach to international trade, making processes faster, cheaper, and more transparent.

Conclusions. The results of the study indicate that the characteristics of international trade development in

Table 3

Features of the spread of digital payment systems as an element of international trade in the context of digitalization

Factors shaping the phenomenon of the spread of digital payment systems	Components shaping the impact of the factor	Features in the exchange of goods, services, capital, technologies, and other economic resources
Mobile payment systems	Mobile wallets	Programs that allow users to store money and make payments via mobile phones (e.g., Apple Pay, Google Pay, Samsung Pay).
	QR codes	Increased use of QR codes for making payments at physical points of sale or online.
Online payment systems	PayPal, Stripe, Skrill, Alipay, WeChat Pay	These systems allow online payments for goods, services, subscriptions, as well as transfers between individuals or businesses.
	E-payments	They enable transactions between different countries and currencies without the need for traditional banking interfaces.
Cryptocurrencies and blockchain technologies	Bitcoin, Ethereum, stablecoins	They are used for international payments and transfers, allowing the bypass of traditional financial intermediaries such as banks, and reducing transaction costs.
	Blockchain	They ensure the security and transparency of financial operations, preventing the alteration or forgery of records in the ledger
Security technologies	Encryption and two-factor authentication	They are used to protect against fraud and safeguard users' personal data in digital payment systems.
	Biometrics	Fingerprint recognition, facial recognition, or voice recognition are used for added security during payment transactions.
Payment systems through social media and messaging apps	WeChat Pay, Facebook Pay, Venmo	Social media platforms and messengers are becoming popular channels for making payments, allowing users to pay for goods and services directly through their accounts.
Payment gateways for businesses	Online stores and platforms	Online stores and platforms use payment gateways to process transactions and ensure security during purchases, such as Stripe, PayPal, or Square.

Source: compiled based on [2–3; 5–6]

Table 4

Features of this process as an element of international trade in the context of digitalization

Factors contributing to the digitalization of customs clearance and regulation	Components shaping the impact of the factor	Features in the exchange of goods, services, capital, technologies, and other economic resources
Electronic customs declaration (e-declaration)	Electronic customs declarations	Platforms that allow customs authorities and businesses to exchange goods data through electronic systems instead of traditional paper documentation.
	Automated declaration submission systems	Implementation of online platforms for submitting customs declarations (e.g., the Asycuda system), which ensures simplicity and speed of the process, as well as integration with other government agencies.
Automated customs control and inspection	Use of specialized software solutions	The use of specialized software solutions for automatic monitoring of correct declarations, customs duties calculation, as well as checking goods for compliance with requirements (standards, certification, etc.).
	Integration with government systems	This includes the integration of customs systems with databases of other authorities, allowing for comprehensive control at all stages of international trade.
Digital certificates and documents	Electronic certificates of origin	Permits, licenses, and other documents that were previously submitted in paper form can now be processed electronically. This reduces the time needed for document processing and lowers the risk of counterfeiting.
	Digital signature system	The digital signature system is used to confirm the authenticity and legal validity of documents within customs procedures.
Blockchain for customs control	Blockchain technologies	Ensuring transparency and security of data exchange between customs authorities, businesses, and other participants in the supply chain.
	Smart contracts	The ability to automate the execution of agreements and payment transactions immediately after certain conditions are met, reducing risks and accelerating processes.
Integration with payment systems	Electronic payments for customs duties and other financial charges	These systems allow for the automatic calculation of customs duties and their payment without the need to physically visit the customs office. This facilitates quicker and more convenient settlements.

Source: compiled based on [2; 4; 6]

the context of digitalization are crucial for shaping new rules, trends, and mechanisms for the functioning of global markets. These characteristics reflect the impact of digital technologies on international trade and have a multifaceted nature, influencing processes related to the exchange of goods, services, capital, technologies, and other economic resources through the expansion of e-commerce, supply chain automation, the spread of digital payment systems, and the digitalization of customs procedures and regulation.

It has been proven that the spread of e-commerce creates new opportunities for the exchange of goods and services via the Internet. This is driven by the implementation of innovative technologies, the development of new business models, the enhancement of infrastructure, and the provision of secure and convenient access to international markets for both companies and consumers.

It has been proven that the automation of supply chains contributes to the optimization of supply management processes, reduces costs, and increases the efficiency and accuracy of logistics operations. The implementation of modern technologies enables a quick response to changes in demand and market conditions.

It has been proven that the spread of digital payment systems ensures convenience, speed, and security in financial transactions, which are critically important for the functioning of international trade. It allows businesses and consumers to make payments through the Internet, mobile apps, and other digital channels, simplifying access to global financial resources.

It has been proven that the digitalization of customs clearance and regulation promotes the automation of customs procedures, reduces administrative burdens, enhances transparency, and minimizes corruption risks. The use of digital technologies in this area accelerates customs clearance processes and contributes to simplifying international trade.

Further research focuses on the development of innovative mechanisms for integrating digital technologies into international trade to enhance the efficiency, security, and accessibility of global markets.

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