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IMPLEMENTATION OF SMART CONTRACTS IN INTERNATIONAL BUSINESS ACTIVITIES

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Review

ABSTRACT

The complexity of business operations in the global economy is rising, necessitating new approaches to contractual relationship management. This article explores the potential of smart contracts as a transformative tool for international business. By utilizing blockchain technology, smart contracts can automate agreements, reduce transaction costs, and enhance security and efficiency. Initially developed on the Ethereum network, smart contracts have since evolved with the introduction of new blockchain platforms. This paper examines the theoretical background of smart contracts, their practical applications in international business activities, and their impact on economic efficiency. Despite high costs of development, insufficient legal frameworks, and trust-related concerns, the findings suggest that smart contracts hold great potential to optimize international economic activities by increasing transparency, reducing risks, and facilitating decentralized governance.

KEYWORDS: *blockchain technology, business processes, digitalization, global economy, international economic relations.*

1. INTRODUCTION

The idea of formalizing contractual relations through digital technology was first proposed by American programmer Nick Szabo in 1994. Szabo defined smart contracts as "a set of promises defined in digital form, including the protocols within which the parties fulfill these promises" (Szabo, 1994). However, the technological limitations of the end of the 20th century and the limited spread of the Internet did not allow for the implementation of this idea.

With the first implementation of the DLT (Distributed Ledger Technology) concept - the launch of the Bitcoin cryptocurrency based on blockchain technology in 2008 (Nakamoto, 2009) - the attention of technical and IT specialists shifted toward developing smart contracts. However, due to the limited capabilities of the first generation of the blockchain, Bitcoin's architecture did not allow the creation of smart contracts. Therefore, in 2014, the Ethereum white paper was published, which proposed a blockchain platform designed not only for cryptocurrency transactions but also for smart contracts (Buterin, 2014).

The innovativeness of this idea allowed the company to raise $18 million at the ICO (Initial Coin Offering), and the network was launched in 2015. Since then, Ethereum has become the world's second-largest cryptocurrency with a capitalization of $300 billion, and has created the field of DeFi (Decentralized Finance), opened up opportunities for creating DAOs (Decentralized Autonomous Organization) and many other functions through smart contract transactions.

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Since then, a significant number of second- and third-generation cryptocurrencies have been created with new features for smart contracts, including Binance Smart Chain (BNB), Cardano (ADA), Polkadot (DOT), Tezos (XTZ), etc. (CoinGecko, 2024).

The issue of using smart contracts has been considered by many foreign scholars, such as Szabo (1994), Buterin (2022), Wood (2019; 2016), and others. As mentioned above, Szabo was the first to use the term "smart contract". In his essay "Smart Contracts: Building Blocks for Digital Markets" he described the concept of smart contracts as protocols that automate the execution and implementation of transactions between parties, without the need for a third party such as legal or financial institutions, but he was limited by the technological capabilities of his time.

Buterin, a co-founder and one of the key figures in Ethereum, regularly publishes and introduces innovative solutions to the blockchain, which was the first to support smart contracts. His research focuses on improving transaction speed on the Ethereum blockchain, reducing the cost of transactions and other operations, and further developing the technological capabilities of the Proof-of-Stake consensus.

In 2016, Wood, one of the co-founders of the Ethereum network, launched his own blockchain network supporting smart contracts, Polkadot, which features multi-chain transactions and the transfer of various types of data or assets between blockchains. Further research and implementation of solutions by Wood and other scientists is aimed at diversifying the capabilities of blockchain-based networks with smart contracts and other innovative solutions.

Catalini, one of the world's leading economists in the field of blockchain technologies, founded the Cryptocurrency Economics Research Laboratory at the Massachusetts Institute of Technology, which studies the economic impact of the introduction of cryptocurrencies and other blockchain technologies, including smart contracts, as well as the possibilities for further implementation of innovative and economically viable solutions in international economic activity. The legal dimensions of smart contracts is being studied separately, including articles on the legal essence of smart contracts, legal aspects of using smart contracts in contractual relations, etc.

In Ukraine, scholars have examined the issue of smart contracts in various areas. Shulpin (2023) analyzes the general use of blockchain technology, with particular attention to smart contracts in copyright protection and management, both in Ukraine and globally. Pohorilenko (2021) examines the theoretical aspect of smart contracts as a means of ensuring the fulfillment of obligations. Mamchur and Nedybalyuk (2018) analyze the legal nature of smart contracts and their admissibility within civil law contractual relations. Nevara (2023) studies both theoretical and practical issues of international legal regulation and the establishment of standard approaches to defining and understanding smart contracts, as well as their legal status within contract and civil law across different countries. Poberezhnyk, Balatska, and Opirsky (2023) published work addressing the issue of decentralized education, specifically the potential of blockchain technologies, including smart contracts and non-fungible tokens (NFTs) for use in education.

Furthermore, in Ukraine, on the basis of the Diia. Osvita platform launched an educational series "Crypto Literacy and Blockchain", , designed to raise public awareness of blockchain technologies - cryptocurrencies, smart contracts, and NFTs, and to promote the development of skills such as analyzing blockchain transactions, using their basic principles, creating cryptocurrency wallets, practicing the basic cyber hygiene in the field of cryptocurrencies, etc.

The main areas of research focus on the properties of smart contracts, their technical features and economic efficiency, as well as their impact of on the financial system and banking. Scholars also examine risks and challenges associated with the use of smart contracts, such as fraud and cyberattacks, legal aspects of smart contract implementation, and the impact of this technology on society, including issues of transparency and trust. Despite this growing body of research, most information on the use of smart contracts in international economic activity remains unsystematized and there is no unified set of indicators or metrics to assess the economic efficiency of the use of smart contracts and other blockchain technologies.

The purpose of this article is to explore the potential of introducing smart contracts into international business activities. To achieve this objective, the following objectives have been set: 1) to characterize the theoretical foundations of the use of smart contracts, 2) to identify ways of implementing them in international business activities, and 3) to analyze their projected efficiency. Taken together, these objectives should clarify whether the use of smart contracts can improve the efficiency of international business operations.

The methodological basis of this study combines general scientific and specialized research methods. Observation and description were applied to outline the theoretical foundations of the functioning and use of smart contracts, the blockchain networks that support them, and their possible implementation in international business. The method of comparison was used to highlight the competitive advantages of smart contracts over existing methods of fulfilling obligations under international contracts. Correlation

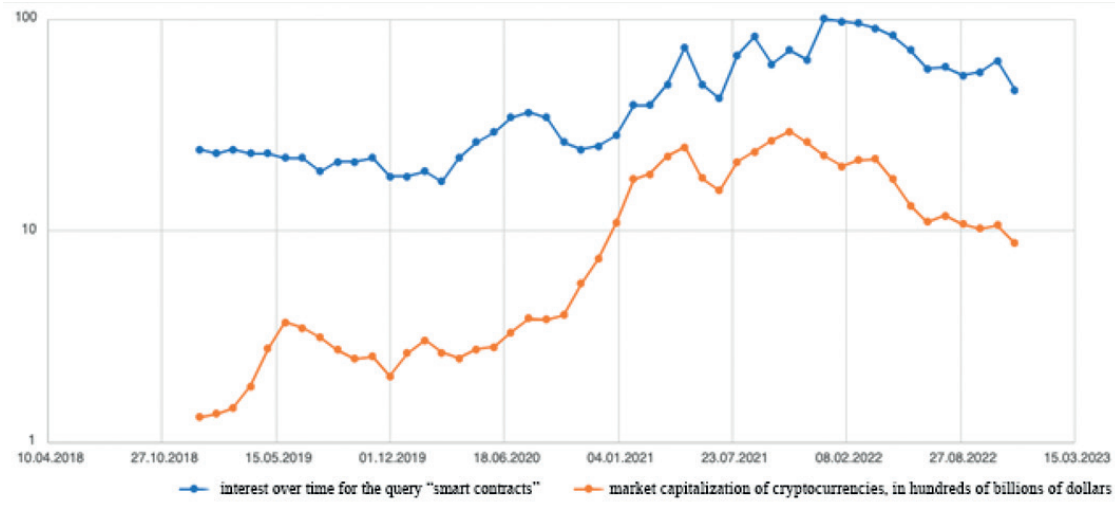

Figure 1. Correlation between interest in smart contracts and the total market capitalization of cryptocurrencies
SOURCE: Author's compilation in Excel based on data from Google Trends (2024) and CoinMarketCap (2024)

analysis was carried out to confirm the relevance of the introduction of smart contracts in operational and international economic activities. The analysis method was used to determine the projected efficiency of using smart contracts. The method of generalization helped to synthesize the findings and formulate conclusions.

The article is structured into three main sections: (1) theoretical foundations of the use of smart contracts, (2)pathways for implementation of smart contracts in international business activities and (3) projected efficiency of smart contracts.

2. THEORETICAL BASIS FOR THE USE OF SMART CONTRACTS

A smart contract is an independent computer algorithm in which the terms of execution are directly embedded in code stored on a distributed, decentralized network, such as a blockchain. This code includes data and instructions that automate transaction execution, ensuring traceability and irreversibility. It is important to note that no intermediary, such as a central server, bank, or government, is required to enforce the terms of a smart contract (Musienko, 2023; Zadobriuk, 2022).

To illustrate the relevance of the topic of smart contracts, a mathematical model was created as shown in Figure 1.

This graph shows interest over time in Google Trends (measured as the popularity of a search term relative to the highest point on the graph for a particular region and time period) for the topic of "smart contract" and compares it to the total market capitalization of cryptocurrencies. The analysis indicates a direct correlation between the two indicators; given the overall upward trend in total market capitalization of cryptocurrencies, this demonstrates growing interest of both individuals and legal entities in the use of smart contracts in various fields.

The general conditions and procedure for the execution of smart contracts can be described in the form of an "if-then" diagram. For example, if Party 1 transfers object A to smart contract X, then smart contract X sends Party 1 object B, as predetermined by the smart contract terms. In addition to transferring objects, which are usually cryptocurrencies, a smart contract may, once its terms are met, perform a specified function or access a distributed data network (such as a program or database, etc.) (Musienko, 2023).

Ethereum remains the most widely used blockchain platform for smart contracts in 2024, but the number of alternatives is increasing in proportion to the growing interest of individuals and legal entities in blockchain technologies, decentralized finance (DeFi) and the emerging Web 3.0 ecosystem (CoinGecko, 2024; Zadobriuk, 2022).

Table 1 presents a comparative overview of major smart platforms.

The Ethereum network, despite being the most widely used platform for smart contracts, has significant disadvantages compared to new platforms, including a much slower transaction speed and significant transaction fees. However, due to its widespread use, this platform is the most studied and accessible to developers and users. An open blockchain means

TABLE 1. Comparative Characteristics Of Smart Contract Platforms

№	Title	Programming language	Blockchain privacy	Execution speed (ops/sec)	Commission (USD)
1.	Ethereum	Solidity	Open	30	1.15
2.	Solana	C, C++, Rust	Open	65,000	0.00025
3.	Avalanche	Solidity	Selective	4,500	0.000000583
4.	HyperledgerFabric	Go, JavaScript	Private	20,000	0
5.	Polkadot	Solidity, JavaScript	Selective	1,000	0.16

SOURCE: Compiled by the author from Khanovich (2024), YCharts (2024), Dune (2024), and BitInfoCharts (2024).

that every transaction is transparent and can be verified through specialized blockchain explorers such as Etherscan (2024).

Solana, current the fifth most widely used cryptocurrency with a capitalization of USD 43 billion (CoinGecko, 2024), is considered the closest alternative to Ethereum . It offers a much higher number of transactions per second and considerably lower fees. However, Solana is less appealing than Ethereum due to its smaller adoption as a smart contract medium and previous vulnerabilities to cyberattacks (Khanovich, 2024). Avalanche and Polkadot, despite being relatively new (introduced in 2020), provide a wide range of tools for developing smart contracts with fast transaction rates. Nonetheless, they are less popular than earlier platforms due to their novelty (Wood, 2016; Jaiswal, 2023). The world's top corporations, including Amazon, Hitachi, and Walmart, employ Hyperledger Fabric, a specialized environment for smart contract applications. Its use of a private blockchain, which conceals all transactions, ensures maximum network security. Although this environment is highly attractive for integration into large companies' internal structure, its broader adoption is limited by its complex architecture and lack of transparency (Khanovich, 2024).

The misconception that smart contracts are completely unmanageable should be dispelled. Although many jurisdictions lack specific laws regulating smart contracts, they are not entirely unregulated. In most countries, smart contracts fall under general contract and civil law, since they are frequently used as instruments to implement agreements. The enforcement of these laws, particularly in international, anonymous contexts, remains challenging and requires further scholarly exploration.

Beyond optimizing payments in virtual assets and integrating them into business operations, smart contracts also have applications in other domains, such as parametric insurance. Parametric insurance is a form of insurance in which the payout is directly tied to a predefined event. Smart contracts provide a tamper-resistant infrastructure for the implementation of parametric insurance contracts, which are activated based on input data. For example, in crop insurance, a farmer may purchase a policy tied to specific weather conditions, such as seasonal rainfall in a geographically defined location. Once the policy expires, the smart contract automatically issues a payout if rainfall levels in the designated location exceed the agreed threshold. Not only do end users receive timely payments with lower administrative costs, but the party offering the insurance can become open to the public through smart contracts. A smart contract allows users to contribute to a pooled fund and then distribute the collected premiums to fund participants according to the percentage of their contribution to the fund.

An important innovation of smart contracts is their ability to enhance the efficiency of crowdfunding. Smart contracts on the Ethereum blockchain provide innovative opportunities for generating digital tokens that can be used for a wide range of transactions. Users have the opportunity to create and distribute their own digital currency by initiating a digital token that can be traded. These tokens conform to a standard application programming interface (API) for coins, such as Ethereum's ERC-20 standards, which guarantee seamless interaction with any compatible exchange wallet. This results in the creation of a trade token with a predetermined quantity, thereby matching certain features of a central bank issuing its own currency.

Key distinctions must be noted, though, since central banks are highly regulated, controlled, and stable organizations that use intricate procedures to guarantee the value stability of money. Therefore, even if the parallel is instructive, caution should be exercised when interpreting it. Securing a lender without established trust is one of the biggest challenges when starting a business and raising funds for its operations. Ethereum-based smart contracts may be employed to facilitate this process. To guarantee the safe retention

of investors' money until a certain date or the funding goal is reached, a smart contract may be developed.

The money may be refunded to the contributors or transferred to the project owners, depending on the outcome. Conventional centralized crowdfunding platforms frequently struggle with trust and governance issues. Crowdfunding is increasingly using decentralized autonomous organizations (DAOs) to address these issues. Each participant in a DAO receives a token that reflects their contribution, and the terms and conditions of the crowdfunding are integrated into a smart contract. This ensures that each contribution is transparently recorded on the blockchain, increasing trust and accountability in the crowdfunding process. (Shkolnyk et al., 2019; Eka Putri, 2024).

The DePIN concept has become one of the main trends in the blockchain industry. DePIN, an acronym for Decentralized Physical Infrastructure Networks, refers to a model that uses tokens to encourage people to provide services through real physical infrastructure, machines, or devices. A DePIN network consists of providers offering real-world services to users, using a public ledger (blockchain) to store records of the services provided and receive rewards for those services using cryptocurrencies that run on the same or another blockchain network. This model leverages blockchain technology and tokenization to mobilize individuals worldwide, enabling them to pool their resources to jointly deploy and maintain various types of infrastructure. This can include everything from physical servers to IoT devices and is used in a variety of industries, including but not limited to cloud services, telecommunications, energy, and more.

DePIN reduces costs associated with traditional physical infrastructure setup and maintenance, including labor expenses. By encouraging users to share their personal network resources through token rewards, it lowers the barriers to entry in the industry. It is important to note that networks built with DePIN rely on nodes (computers equipped with specialized software that enables them to act as functional nodes necessary for the operation of a decentralized network), which reduces the risk of data loss from malicious attacks or technical failures. This represents a significant advantage over traditional physical infrastructure networks.

DePIN allows anyone, anywhere, to participate in the creation of a physical infrastructure that meets the needs of a wide range of users. In contrast, traditional infrastructure projects are often operated by centralized entities that define the terms and conditions of access and management. Smart contracts are an important tool in implementing the DePIN concept, enabling the creation of decentralized networks that use real physical resources to deliver services and create value (Nazarova et al., 2021; Britchenko & Cherniavska, 2019).

For entities engaged in international economic activity, the most effective approach is to use smart contracts not on one platform but on different platforms, depending on the specific task at hand.

3. WAYS TO USE SMART CONTRACTS IN INTERNATIONAL BUSINESS ACTIVITIES

Given the currently unregulated legal status of smart contracts, international economic operators should take into account the risks when signing agreements that involve smart contracts. Also, at the stage of smart contracts implementation, it is advisable to implement them into established instruments of international economic activity (Zadobriuk, 2022).

The first option for implementing smart contracts is to use this technology in international settlements. The most common form of international payments is advance payment. The main advantage is its relative simplicity compared to other forms of international payments. However, the use of advance payment is associated with significant risks, the main one being the risk of non-delivery of goods after receiving payment (Mazaraki et al., 2019). The introduction of smart contracts is one of the ways to reduce the risks of advance payment.

Table 2 shows the stages of making advance payments using a smart contract.

The main advantage of using a smart contract when making an advance payment is a significant reduction in the risk of not receiving the subject matter of the agreement, provided that the subject matter is an intangible asset. However, it is impossible to reduce the risk to zero due to the human factor involved in creating a smart contract, which may include errors in programming the smart contract code.

A similar methodology for using smart contracts is possible in other non-documentary forms of payment, such as payment upon receipt or open account transactions. Smart contracts can also be used in documentary forms of payment, such as a letter of credit.

Table 3 describes the stages of executing a letter of credit and the possibility of using a smart contract at each of these stages.

The main task of smart contracts when executing a letter of credit is to automate the process of transferring documents and making a payment. At each stage, it is possible to create a smart contract, whose execution results in either the transfer of documents or settlement at the payment stage. This will significantly reduce the time for letter of credit execution. The biggest risk is the large number of smart contracts involved, which increases the increases the likelihood of errors during their creation. Another factor is the

TABLE 2 Advance payment using a smart contract

Stage number	Description of the stage	Key features of the stage, including the role of smart contracts
1	Signing of the contract by the parties	The parties must specify in the agreement that they will use a smart contract, identify the blockchain environment and cryptocurrency involved, and determine the distribution of costs and risks related to its creation.
2	The seller creates a smart contract	The seller must create the smart contract in the blockchain environment specified in the agreement and notify the buyer when it is ready for execution.
3	The buyer fulfills the terms of the smart contract (cryptocurrency transfer)	Once executed, the smart contract automatically transfers the object of the agreement to the buyer (if intangible) or notifies the seller to immediately ship the object of the agreement to the buyer (if tangible)

SOURCE: Author's elaboration based on Mazaraki et al., 2019 and Musienko, 2023

TABLE 3 Execution of a letter of credit using smart contracts

Stage number	Name of the stage	The possibility of using a smart contract
1	Conclusion of the contract	
2	Notification of shipment readiness	A smart contract can be used with the algorithm: "If the exporter fulfills the conditions (sends a token), the importer receives a notification of shipment readiness"
3	Application for opening a letter of credit	A smart contract between the importer and the issuing bank can be used with the algorithm: "If the importer executes a smart contract, the issuing bank automatically opens a letter of credit"
4	Letter of credit	A smart contract between the exporter's bank and the importer's bank can be used with the algorithm: "If the importer's bank executes the smart contract, the importer's bank receives the letter of credit"
5	Advancing a letter of credit	A smart contract between the exporter's bank and the exporter can be used with the algorithm: "If the exporter's bank executes the smart contract, the exporter receives a notification about the letter of credit readiness and checks for compliance"
6	Shipment	
7	Transfer of documents	A smart contract between the exporter and the exporter's bank can be used with the algorithm: "If the exporter fulfills the terms of the smart contract, the exporter's bank receives the necessary documents and checks them for compliance"
8	Payment	A smart contract can be used with the algorithm: "if the transfer of the asset specified in the terms of the letter of credit is carried out, then the smart contract is executed"
9	Receiving the goods	

SOURCE: Author's elaboration based on Mazaraki et al., 2019 and Musienko, 2023

distrust that most modern banks and other financial institutions have toward blockchain technologies, which complicates the implementation of smart contracts in this form of payment.

Smart contracts can also be implemented in the internal structure of large enterprises engaged in international economic activity. Here, the main function is to automate interaction between different depart-

TABLE 4 Comparative Analysis of Transaction Execution Methods

Indicator	Transaction type	Smart contract	Conventional bank escrow	Normal (unsecured)
Speed of calculation execution	0.1–20 seconds	1–3 working days	1–3 working days	Immediate to 1–3 working days
Payment execution fee, USD	4.75	50–100	25	0–50 (depending on method)
Speed of goods transfer	Simultaneous with calculation	After escrow release (1–3 working days or more)	From 1 hour	From 1 hour
Probability of transfer of goods	99.5%–100% (based on automation reliability)	90–95% (depending on escrow terms and enforcement)	50–100% (depending on trust and enforcement)	
Additional setup costs	Development/deployment costs vary (e.g., USD100–500 upfront)	Initial setup and agreement fees (depending on notary/escrow provider)	None	None

SOURCE: Author's elaboration based on Dune, 2024, BitInfoCharts, 2024, PrivatBank, 2024a, and Eka Putri et al., 2024

ments. For example, when a payment notification is received via a smart contract, the accounting department sends a message to the warehouse to ship the goods via a new smart contract. There are many ways to use smart contracts within an enterprise, but such applications are only possible if a distributed ledger system is implemented across the organization (Musienko, 2023).

An important aspect of using smart contracts in international business is the handling of virtual assets (cryptocurrencies, etc.) received as payment for their execution. A business entity can register with specialized centralized cryptocurrency exchanges for the subsequent sale of a virtual asset for fiat money or exchange it through specialized exchange points. The most important factor in transactions with virtual assets is compliance with the AML principle (Anti-Money Laundering) and other requirements set forth by the FATF (Financial Action Task Force, an international organization established to combat attempts to legalize the proceeds of crime and terrorist financing) in the standards for virtual assets and virtual asset service providers (FATF, 2023; 2021). The MVPD entity may also retain the assets for long-term investment, use them for further settlements under smart contracts, or treat them as a reserve asset of the enterprise, etc.

4. EVALUATION OF THE EFFECTIVENESS OF SMART CONTRACT IMPLEMENTATION IN INTERNATIONAL BUSINESS ACTIVITIES

When assessing the effectiveness of the implementation of smart contracts in international trade, it is important to consider their main advantages: transparency, automation, cost-effectiveness, security, and reduction of the trust factor (Musienko, 2023).

In the case of concluding a contract with advance payment, the main efficiency factors of using a smart contract compared to the conventional method are the cost and the speed of settlement transactions. To evaluate the effectiveness, a comparative analysis is carried out for the execution of a contract worth 5,000 USD. The smart contract is executed on the Ethereum network (ERC-20), while settlement in the conventional method is conducted through the international payment system SWIFT. The subject of the contract is an intangible asset, namely access to technical documentation stored in cloud storage (Table 4).

Conducting a transaction using a smart contract is more efficient and cost-effective for both the exporter and the importer. A smart contract settles much faster, involves lower payment fees, and eliminates delays in receipt or the risk of non-receipt of goods by the buyer, since it guarantees the transfer of goods simultaneously

TABLE 5 Comparative Analysis of Smart Contracts and Letters of Credit

Analysis criterion	Form of settlement	
	Smart contract	Letter of credit
Exporter's expenses (advancing the letter of credit)	~5 USD	~0.15% of the contract amount
Importer's expenses (issuing a letter of credit, verifying documents, and making payment)	~17 USD	~1% of the contract amount
Processing speed	Up to 1 hour	1-7 business days

SOURCE: Author's elaboration based on YCharts, 2024, Dune, 2024, Edin, 2024 and; PrivatBank, 2024b

with settlement. However, the disadvantage of smart contracts is the development cost, which typically ranges from USD 7,000 to 15,000 when outsourced (Apptunix, 2024). However, it is important to note that a company can order one standard smart contract, with terms adjusted according to the foreign trade contract, while customization may be handled either by outsourced developers or the company's internal IT department. In addition, when implementing blockchain technologies within an enterprise, it is advisable to train all employees, including those in the foreign trade department, enabling them to independently fill in the terms and conditions of smart contracts.

The main criteria for assessing the efficiency of using smart contracts in executing a letter of credit are execution speed and the parties' costs of servicing the letter of credit. For the comparative analysis, we used data on letter of credit servicing in Ukraine and data on smart contracts executed on the Ethereum network (Table 5).

A smart contract is more profitable because it eliminates intermediaries such as banks between the parties to the transaction. For example, with a contract worth $100,000, the importer must pay the bank about $1,000, and the processing time is at least 1 business day. A comprehensive smart contract can automate the process of transferring documents and making payments under the contract. However, the cost of creating a comprehensive smart contract can be $15,000-25,000 (Apptunix, 2024) To create, operate, and audit smart contracts that perform the function of a letter of credit, the same solutions can be applied as for smart contracts used in advance payment contracts, namely, namely outsourcing development, using standardized smart contracts, and training staff in their use.

To comprehend how civil and contract laws relate to smart contracts in cross-border transactions, future scholars should concentrate on analyzing cross-jurisdictional legal frameworks. For smart contracts to be widely adopted, standardized metrics for assessing their economic impact must be developed. Barriers to trust in blockchain systems should be addressed, and strategies for developing cost-saving smart contracts are worth investigating. Researchers should also examine decentralized governance models like DAOs and interdisciplinary applications, including the integration of smart contracts with AI and IoT. Finally, analyzing successful teaching and training methods can enable companies to deploy and administer smart contracts effectively, encouraging broader adoption and innovation.

5. CONCLUSIONS

By automating transactions, reducing reliance on intermediaries, and increasing efficiency, the application of smart contracts represents a paradigm shift in global commerce. Their ability to reduce risks and costs in advance payments, letters of credit, and other forms of international settlements demonstrates their practical advantages over traditional methods. Furthermore, by enabling innovative applications such as decentralized crowdfunding, parametric insurance, and decentralized physical infrastructure networks (DePIN), smart contracts show their versatility across a variety of industries.

However, there are significant barriers to their widespread adoption, including the high cost of development and auditing, the absence of global regulatory frameworks, and the need for extensive training to ensure effective use. The lack of confidence that many large corporations have in blockchain technology is another barrier. Legislators, businesses, and technologists must collaborate to develop clear regulations to overcome these challenges and build greater trust in blockchain systems. The study highlights the transformative potential of smart contracts in international business . As stakeholders become more aware of their role in enhancing transparency, reducing risks, and streamlining processes, their use is expected to grow. By fostering innovation and decentralized solutions , smart contracts have the potential to have significantly shape the future of international trade.

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IMPLEMENTACIJA PAMETNIH UGOVORA U MEĐUNARODNIM POSLOVNIM AKTIVNOSTIMA

SAŽETAK

Složenost poslovnih operacija u globalnom gospodarstvu neprestano raste, što zahtijeva nove pristupe upravljanju ugovornim odnosima. Ovaj članak istražuje potencijal pametnih ugovora kao transformativnog alata u međunarodnom poslovanju. Korištenjem tehnologije blockchaina, pametni ugovori mogu automatizirati provedbu ugovora, smanjiti transakcijske troškove te povećati sigurnost i učinkovitost. Iako su izvorno razvijeni na mreži Ethereum, pametni su ugovori evoluirali uvođenjem novih blockchain platformi. U radu se razmatra teorijska podloga pametnih ugovora, njihova praktična primjena u međunarodnim poslovnim aktivnostima te njihov utjecaj na ekonomsku učinkovitost. Unatoč visokim troškovima razvoja, nedostatnim pravnim okvirima i pitanjima povjerenja, rezultati upućuju na to da pametni ugovori imaju značajan potencijal za optimizaciju međunarodnih gospodarskih aktivnosti povećanjem transparentnosti, smanjenjem rizika i poticanjem decentraliziranog upravljanja.

KLJUČNE RIJEČI: *blockchain tehnologija, poslovni procesi, digitalizacija, svjetsko gospodarstvo, međunarodni ekonomski odnosi.*

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