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Configuration of Incoterms into Smart Contracts: a View of International Sales Contracts through a Futuristic Periscope

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Keywords

blockchain technology,
contract,
decentralized finance (DeFi),
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Incoterms,
international law,
international trade,
law,
smart contract

Abstract

Objective: to identify the prospects of international trade in the light of synchronizing Incoterms with smart contracts.

Methods: the study is based on the general scientific methods of analysis, synthesis, comparison, and formal-legal method necessary to analyze the provisions of Incoterms.

Results: the authors analyzed the provisions of Incoterms and technological innovations in commercial law; showed the connection between the practice of commercial law and technological development due to the inclusion of contractual terms in blockchain. It is noted that the integration of blockchain technology with smart contracts has led to a variety of automated business transactions and the creation of a platform for synthetic assets trading. The authors describe the possibilities of secure and easy transactions in international trade using blockchain. Despite the uniqueness of this technology, its different types are distinguished, namely: public, private, hybrid, and consortium blockchain. It is substantiated that the synchronization of Incoterms with smart contracts can improve the prospects of international trade (especially export-import contracts). It is emphasized that smart contracts based on blockchain can revolutionize the application of Incoterms, consequently increasing the efficiency of transactions between parties to export-import relationships. One of the fundamental changes that smart contracts will bring to these trade transactions is the reduction of errors and misinterpretations of Incoterms. The authors use specific cases

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to demonstrate disputes arising at the stages of transaction conclusion and execution, which could have been avoided using modern technologies.

Scientific novelty: The paper shows the phenomenon of synchronizing Incoterms with blockchain and how it can affect the form of contracts and facilitate their smooth execution. The proposed approach to analyzing the phenomenon takes into account the revolutionary innovations in cross-border trade, which are compared with the usual ways of applying Incoterms in traditional international trade contracts.

Practical significance: the research provides suggestions and recommendations for further development of innovations in the field of smart contracts, especially export-import trade contracts on a global scale.

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Introduction

The advent of digitalization in the kaleidoscope of scientific evolution is rapidly changing the traditional patterns of human endeavour, blowing off long-standing conventions and methods of doing things in the process. Even in the sphere of global commerce, so many revolutionary digital technologies have set the gears of change in motion. One of such unprecedented technological breakthroughs changing the narrative is the blockchain technology. It has created safe systems that provide security, data integrity, and anonymity in commercial transactions between parties, free from the control of a central repository or authority. This decentralized data management technology that became operational in 2008 as a catalyst for Bitcoin cryptocurrency has summoned the aura of future business

operations to the present. More so, this distributed software has heralded the vicissitudes of automated business transactions and has created a platform for smart contracts to thrive. The idea of incorporating the terms of a contract into series of blockchain has created a nexus between the practice of business law evolution and machines. The integration of blockchain technology with smart contracts will make the dream of a "peer-to-peer market" come true (Zibin Zheng et al., 2020). This form of digital contract is predicated on the automatic execution of terms that are embedded in series of blockchain, structured with predefined conditions, which, if met, activate the contract (Souei et al., 2023; Stojanović & Ivetić, 2020; Vatiero, 2022). Despite the nascence of smart contracts, the prospects of them eradicating certain shortcomings of "paper and pen" contracts are very high.

At the international front, trade transactions dealing with export contracts involving buyers and sellers have over time been subjected to certain regulations by the International Chamber of Commerce (ICC). These regulations which are known as International Commercial Terms (Incoterms) have been continuously employed to ease the implementation of international trade transactions as far back as 1936 (Coetzee, 2002). In order to be in the loop with prevailing circumstances looming along the horizon of global business, these terms are updated at intervals, of which the current version became operational in 2020. These Incoterms directs the course of transactions between parties in export/import trade transactions by defining their duties, rights, and responsibilities of contracting parties.

Adopting a futuristic disposition in the line of analysis, this paper explores the possibility of easing transactions in international trade safely and easily by reclining on the leverage of blockchain technology. Dwelling particularly on the Incoterms, this paper canvasses argument on how their synchronization into smart contracts can change the outlook of international trade (especially export/import contracts) for the better.

1. Basic concepts

1.1. Incoterms

International Commercial Terms, colloquially known by the short form "Incoterms" are universal terms that define transactions between importers and exporters. These are a set of rules/regulations established by the International Commercial Chamber (ICC) to ease the course of international sales transactions between parties by defining the various features associated with trade viz. risk involved, the rights and obligations of the parties, and transportation management between exporters and the importers. Although Incoterms are only formal procedures, they also apply as a contract language and law in export/import trade transactions (Davis & Vogt, 2022; Lim & En-Rong, 2021). Be that as it may, Incoterms do not automatically set in to commandeer the course of a transaction between parties. This is due to the fact that these terms are not mandatory, and can only come into effect when parties have them incorporated into the terms of their sales contract[1].

[1] Incoterms in International Trade. (2020, June 18). Aceris Law LLC. https://clck.ru/3BefKf

Incoterms were first introduced into the regulatory framework of international sales contracts in 1936 by the International Chamber of Commerce (ICC) to minimize misunderstandings in foreign trade contracts by clearly defining the rights and obligations of sellers and buyers. In order to conform to dynamic circumstances within the global business landscape, Incoterms are regularly updated[2]. The Incoterms 2020 are the version of Incoterms that are operational currently. The quest to promote an open international market and enhance global economic growth being the defining purpose of the International Chamber of Commerce (ICC) has been bolstered by Incoterms due to their instrumental role in enhancing seamless trade transactions across the globe.

Despite their mandatory nature, Incoterms have over time been incorporated into international trade to facilitate the smooth execution of export/import contracts between numerous parties across several nations of the world. Since 1936 when the first Incoterms were published, they have been revised several times – in 1953, 1967, 1976, 1980, 1990, and 2010, in order for them to meet the demands of changes looming across the global business landscape (Agaoglu, 2020). The Incoterms 2020 which replaced the Incoterms 2020 came into effect on the 1st of January, 2020, and is still the version that is globally in use currently[3]. The Incoterms 2020 has improved on the visible weaknesses of the 2010 version despite the absence of significant additions to the number of terms. The rules are updated and grouped into two categories that reflect transportation modes. Out of the 11 incoterms, seven are provisions of trade to be done in “any mode” and the other four are for the sale of goods via transportation on “land” or “sea” or “inland waterway”. They closely correspond with the U.N Convention on Contracts for International Sales of Goods.

For the importer, the most advantageous Incoterms in terms of favourable costs are the Delivered at Place (DAP), Delivered Duty Paid (DDP), and the Delivered At Terminal (DAT). While the exporter, the most advantageous Incoterms are the Ex Works (ExW), Free Carrier (FCA), Carriage Paid To (CPT), Free Alongside Ship (FAS), Free On Board (FOB), Carriage and Insurance Paid To (CIP), Cost and Freight (CFR), and Cost Insurance and Freight (CIF). “The choice of the most suitable Incoterms for an importer or exporter will depend on whether they want to control costs, contract the main transport, reduce risks or have greater security in the logistics chain”[4].

Unlike domestic trade policies, incoterms embrace a far-reaching applicability, and can be used by any country for trading internationally. By the virtue of its nature, they are not legally binding, hence, their explicit incorporation into an international sale of good contract is strictly at the discretion of the parties involved. Consequently, the

2 Troy Segal. (2023, December 22). Incoterms Explained: Definition, Examples, Rules, Pros & Cons. Investopedia. https://clck.ru/3BefPS

3 Ibid.

4 Incoterms: how to choose to import and export. (2022, September 11). Logisber. https://clck.ru/3BegEu

incorporation of incoterms in the contract does not set the provisions of contractual rights and obligations except in the matters of deliveries. They are not remedial in nature and do not carry solutions for breach of any contractual obligation.

1.2. Blockchain

Blockchain is a decentralized digital channel to record transactions between two parties. Unlike other transactions where there is an involvement of a third party organization to authenticate the transaction, blockchain works without any central authority or repository. More so, the immutable feature of blockchains makes it impossible for transactions stored on it to be tampered with or traced. Arguments abound that blockchain creates room for digitalized trust by enhancing certainty of execution and creation of efficiency through the removal of intermediaries and their concomitant costs (Durovic & Janssen, 2019).

The breakthrough for the establishment of blockchain technology was laid by Satoshi Nakamoto (the inventor of Bitcoin) when he published a paper on Bitcoin in the year 2008[5]. The paper titled "Bitcoin: A Peer-to-peer Electronic Cash System" described, inter alia, a systematic electronic means of payment of payment strictly based on cryptography[6]. Prior to this period, important steps were taken by scholars such as Stuart Haber, Scott Stornetta, David Chaum, and Adam Back who had published whitepapers centred on the creation of digital currencies anchored on cryptography[7]. Hence, the advent of Bitcoin marked the maturity of a digital currency revolution that had been brewing beneath the digital technology space for decades.

Generally, blockchains are distributed ledger systems maintained by individual nodes that form a record of all the transactions carried out within them (Papadouli & Papakonstantinou, 2023). As a result of their immutability, the information about every transaction available across the nodes on such ledgers creates a great amount of data integrity[8]. However, all the nodes are anonymous but their identifiers are not. This creates a transparency in the process and makes it more secure for the other nodes to comply and confirm transactions. Another advantage that blockchain technology holds is high resistance to any modification or alteration. Since it is a database of records, which are not tampered with nor deleted at any point in time, it is highly favourable in fields that require data security and scalability. Blockchain technology has today not only flourished in transactions concerning the digital trade of commodities or services, via cryptocurrencies alone, but is also gaining grounds in different fields of governance, finance, healthcare, utilities, and smart contracts. Its various implementations can be designed based on its functions and purposes in mind.

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5 Sarmah, Sh. S. (2018). Understanding Blockchain Technology. Computer Science and Engineering, 8(2), 23–24.

6 Id. at 23.

7 Id. at 23.

8 Id. at 23.

It is pertinent to note that despite the general uniqueness of blockchain technology, blockchains belong to various categories. There are four categories of blockchain, namely: public blockchain, private blockchain, hybrid blockchain, and consortium blockchain. From these categories, public technology is the most decentralized one because it lacks any form of restrictions; hence, it can be accessed by anybody who has access to the internet[9]. Examples of public blockchain include Bitcoin and Ethereum. Private blockchain also works in a similar way as public blockchain, however, they operate with a sort of centralized database that grants access only to those users who are part of the network (Vijai et al., 2019). Good examples are Hyperledger and Corda. Hybrid blockchain as the name implies combines the features of both public and private blockchain where it is partially under the control of an organization while it is still projected as a public blockchain on the flipside[10]. Some known examples of hybrid blockchain are Ripple network and XRP Token. The structure of a consortium blockchain revolves around a handful of organizations whose pioneering assigned users define the process of its operations (Vijai et al., 2019). Some examples of consortium blockchain include Multichain and Tendermint. Be it as it may that these categories of blockchain technology vary along certain lines, it is still a fact that all of them operate on decentralized software system that processes transactions across a broad-range of computers in such a way that no alteration, hacking, or cheating is possible.

1.3. Smart contract

"Smart contract" is a term used to describe computer codes that automatically execute all or parts of an agreement stored on a blockchain-based platform[11]. This unprecedented form of contract stands out from all other forms because its terms are automatically executed (Huang et al., 2024). The automatic execution of smart contracts is facilitated by their attachment to blockchain, which works by automating value transfer when certain predefined conditions are met by parties. Due to the efficient execution of terms in a smart contract, its defining nature is considered to be effective in the reduction of transaction and legal costs, risks, and other forms of inefficiencies commonly associated with conventional forms of contract (Zibin Zheng et al., 2020). Smart contracts work by storing, replicating, and updating the transactions in an agreement on blockchains (Dixit et al., 2022; Detwal et al., 2023). The codes containing the content of an agreement in smart contracts are decentralized across a blockchain network, hence, making transactions carried out on them free from any form of repository censorship and prying eyes of a third party.

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9 GEEKSFORGEEKS. https://clck.ru/3Beg9Y

10 Ibid.

11 Levi, S., & Lipton, A. (2018, May 26). An Introduction to Smart Contracts and their Potential and Inherent Limitations, Harvard Law School Forum on Corporate Governance. https://clck.ru/3BegAy

Smart contracts first came into light through Nick Szabo in 1994, who conceived the idea of a digital realm where synthetic assets could be traded using computerized contracts embedded into distributed ledgers[12]. Since 1994 when Nick Szabo first brought forth the idea of smart contract, knowledge of its revolutionary functionalities has been gradually sweeping across the world. In recent years, the business world is gradually getting absorbed in its dogma (Ante, 2021; Chu et al., 2023). Describing this unprecedented form of contract, Nick Szabo defined smart contracts as "computerized transaction protocols that execute terms of a contract" (Szabo, 1996). This brief description clearly distinguishes smart contracts from conventional contracts due to their unique functionalities and features. The concept is based on the idea of translating the contractual clauses related to various provisions, for example, that of collateral, lien, or bonding, into codes which are to be embedded in property such as a hardware or a software which can self-enforce them (Eenmaa & Schmidt-Kessen, 2019; Ferro et al., 2023). This would terminate the need of any trusted intermediary as a third party organization. The code can be a mere manifestation of the contract or a traditional fully drafted contract. It leverages the blockchain technology. The code is deployed using cryptographically signed transactions on a blockchain. The codes are replicated via the multiple nodes registered on the blockchain and are therefore safe from any modification or deletion. The users of the blockchain where the code is registered can create transactions, while the blockchain saves the data in the database and sends it to public functions offered by a smart contract[13].

From a strict legal perspective, it has been argued that smart contracts are neither legal contracts in the traditional sense nor are they smart; the term is therefore a misnomer. A broad range of argument have spanned the spectrum of thoughts as regards the legal enforceability of smart contracts in the same way as conventional contracts. It is argued that smart contracts will improve the instantiation of the contract conditions through the digitalization of the enforcement process by automatically enforcing the terms by way of responding to the fulfilment of conditional statements embedded in the blockchain; hence, they obviate the need for a third party, i.e. a judge, to enforce the terms (Raskin, 2017). On the other hand, it is argued that smart contracts do not fulfil all the universal conditions defining the existence of a contract; hence, in the occurrence of certain eventualities, the essence of indulging in such contracts will be defeated by the peculiarities of the blockchain technology[14]. Whichever lane of thought one toes, it is without an unmistakable ring of truth that smart contracts are a pre-emptive form

12 Frankein, J. (2022, August 30). Smart Contracts. Investopedia. https://clck.ru/3BegCJ

13 Mell, P. M., Kelsey, J. M., & Shook, J. (2022, August 30). Cryptocurrency Smart Contracts for Distributed Consensus of Public Randomness. NIST. https://clck.ru/3BegDG

14 O'Connell, J. (2019, December 19). The Trouble with Smart Contracts. Mayo Wyne Baxter Solicitors. https://clck.ru/3BegGR

of contact that will sweep the world in due time, while creating an intersection between the law and technology. Since smart contracts and blockchain technology are still in the stage of nascence, we should wait and see how the legal systems across the world will handle these agreements in terms of taxation and other laws.

2. Smart contracts and decentralized finance: a leverage for trading synthetic assets

One of the most celebrated relevances of blockchain technology is the installation of decentralized platforms over which financial services like those of a bank or any financial institution are provided. The trade happening on these networks employs synthetic assets, which are tokenized derivatives of an underlying asset. Crypto-currency based synthetic assets are the ones that possess the value of the derivative without needing to hold the underlying asset. They offer users all the benefits of decentralization of their investments, as they are open and available to all the users across the world by the means of smart contract. The decentralized platform on which these synthetic assets are traded is known as Decentralized Finance (DeFi). It is a blockchain-based financial infrastructure that refers to an open, permissionless, and highly functional protocol stack built on public smart contract platforms. Reports have it that the assets on Defi protocols as of September 2021 were worth US$92 billion[15].

The DeFi works on a multi-layered system. Every layer in the architecture performs a distinct function. The layers build on each other and create an open and highly composable infrastructure that allows everyone to build on, rehash, or use other parts of the stack. The first layer is the settlement layer. It consists of the blockchain and the native protocol assets. For the ownership information to be stored securely, it is done on the settlement layer and any state changes are to be in accordance with its ruleset. It serves as a settlement and dispute resolution layer making the blockchain a foundation for trustless execution. The second layer is the asset layer, which consists of all the assets issued on the settlement layer. Standardized smart contracts are used to construct base assets in the asset layer as a fundamental financial operation. It includes all the native protocol assets as well as those assets that are additional and are issued on the blockchain. The third layer is the protocol layer where standards are provided for certain use cases like decentralised exchanges, debt markets, derivatives, and on-chain asset management. Any user can access these standards, which are often implemented as a collection of smart contracts (or DeFi application). These protocols are therefore very interoperable. The fourth layer is the application layer. In this layer, the assets serve as the foundation of the increasingly sophisticated financial products. Here, DeFi applications are implemented as complex smart contracts which enable deterministic execution of supplied business logic.

[15] McDonald, E. (2021, November 5). Smart Contracts. Columbia Business Law Review. https://clck.ru/3BegHv

The interaction is powered by web browser-based front end, which makes the protocols easier to use. The applications implemented are user-oriented for easy connection to the individual protocols. The fifth layer is the aggregation layer. The DeFi applications provide a range of various financial services that are user-friendly and transparent making them attractive for use. All kinds of activities like trading, lending, insurance services and asset management can become easy with the use of DeFi. The rate and the comparison of the services for the purpose of these activities across the ecosystem are well managed by the aggregation layer. The aggregators provide user-centric platforms to connect to several applications and protocols. This provides tools that can help in comparing the services and determining the rates and perform complex task by connecting to several protocols simultaneously. Finally, these user-friendly applications combine and concise the data to build a service similar to banking applications.

3. Redefining international trade contracts: synchronization of law with blockchain technology

Over a long stretch of time, the course of export and import trade has been defined by different versions of International Commercial Terms (Incoterms) formulated by the International Chamber of Commerce (ICC). These Incoterms enhance the transactions between parties by properly defining their roles, duties, responsibilities, and risk transfer in the course of the transactions. It is without a doubt that Incoterms have played an instrumental role in facilitating the execution process of international trade transactions involving buyers and sellers. On the other hand, it is also true that the functionalities of Incoterms have umpteen times failed to shelve transactions from latent circumstances capable of distorting the smooth sail of such international trade transactions (Petrová et al., 2021). These drawbacks are in themselves intrinsic parts of the complex and dispute-prone nature of export and import trade transactions. While a good number of these sabotaging factors are occasioned by frustrating factors beyond the control of the parties, others are manifestations of weaknesses in the contract execution process. Despite the regular revision of Incoterms to suit the contemporary global business climate, putting such drawbacks in reins have not been entirely successful. It is to this end that smart contracts suffice to hem every loose edge using blockchain technology.

Generally, the adoption of smart contracts in international trade would eliminate intermediary intervention, reduce costs, enhance security of transactions, and facilitate transparency in the process (Belú, 2019). The automated execution process of smart contracts is capable of absorbing parties of hitches that can be identified with the current mode by which incoterms are implemented. Despite the significant improvements made in the latest operational version of Incoterms (Incoterms 2020) in response to dynamics such as intermodal complexities, e-commerce, and service proliferation in international trade, the difficulties concomitant with the implementation of these amendments still loom over the horizon. This spectrum of challenges surrounding the implementation

of Incoterms can be totally absorbed by smart contracts. Smart contracts, enabled by the blockchain technology, can be employed in the realm of international trade to drive efficiency and reduce friction along the lines of identity verification, ownership proof, cost reduction, and other logistical issues.

The process of configuring Incoterms into a smart contract will ease the execution of an export-import trade for both parties involved. The advantages of this synchronization will not just ease the execution process alone, but will also guarantee the credibility of the transactional mechanism.

One fundamental difference that smart contracts will make in export/import trade transactions lies in the aspect of reducing errors and misinterpretations of the Incoterms Rules. This is best explained in reference to the complex nature of export/import contracts, which are normally fraught with a lot of terms that are quite cumbersome to understand. The assimilation of smart contracts will not only simplify the transaction mechanism (Belú, 2019), but will also ease the logistics. The scope of an export/import operation involves so many people, protocols, and logistics. As a result of the lengthy procedures and intermediaries that are involved in the export/import transactions, firms or individuals involved in it end up getting frustrated. More so, firms dealing with time sensitive products even end up defeated in the pursuit of their goals[16].

This issue of logistics and protracted protocols reposes a more profound effect on traders in developing nations. A good example of an international sales contract that got entangled in a lot of legal controversy as a result of complicated logistics of export/import trade is the dispute that ensued between Pharmaplast (an Egyptian shareholding company in Alexandria), a manufacturer of care products, and Urica, a California-based corporation, that imports and distributes wound care products. Through the reliance on the role of URI (a limited liability company) as a third party handling the execution process, they entered into a contract (an exclusivity agreement) on the 10th of February, 2004. The contract terms stated that Pharmaplast would supply Urica with wound care products through URI for the span of ten years, to be distributed in the United States. In the course of following the agreement terms, series of issues arose due to the misinterpretation of certain terms, hence giving rise to a law suit[17] that protracted for many years, sweeping many persons along as parties. Disputes akin to this case abound in international sale of goods contracts. However, the adoption of smart contracts will eradicate such difficulties and reduce the chances of international sales transactions ending up in disputes. Smart contracts operate based on the protocol of "if this..., then that" (Lasmoles & Diallo, 2022). Hence, if the terms of international trade contracts (especially export/import contracts) are programmed based on this "precondition" and "execution" protocol across series of blockchains

16 Nordas, H. K., Pinali, E., & Grosso, M. G. (2006). Logistics and Time as a Trade Barrier. OECD Yrade Policy Working Papers, 35, 1, 4.

17 Urica, Inc. v. Pharmaplast SAE, CV 11-02476 MM (RZx).

that allows self-execution, then the number of misinterpretation incidents in the course of execution will be reduced.

On another note, smart contracts are capable of easing the documentation of export/import contracts. It is a known fact that the paperwork, transactional agreements, and correspondence between contracting parties as well as intermediaries is cumbersome. "In international trade, the number of documents required and the nature of the documentation will vary greatly depending on the underlying contract (e.g. sales contract), the nature of the goods, the value of the cargo, the complexity of the export sale, the shipment/transport required and the rules, restrictions and trade agreements of the countries concerned" (Sang Man Kim, 2021). However, the constant factor remains that these documents are normally bulky, and sometimes too complex to work on within a short time.

The bulkiness of contracts alone makes it difficult for some parties to fully understand the terms of such contracts, talk more of their execution process. In an export/import transaction, the elaborate paperwork documenting several Incoterms to control the entire process of execution span across several intermediaries, each with its own indispensable role. These documents are: documents issued by the importer, the exporter, by the authorities, bank documents, and documents issued by the carrier (Belú, 2019). All the aforementioned series of documents play instrumental roles in the formulation and execution of a typical import/export transaction. In the course of sorting out this long chain of documents, some contracts end up being discharged by frustration. It is to the above end that smart contracts suffices as the best way to cut down the lengthy correspondence between contracting parties, and with intermediaries. Since smart contracts work automatically by executing incorporated terms when certain conditions are met, then the incorporation of all conditions and Incoterms applicable in international sales contracts into series of blockchains will eradicate the delays and issues that comes with conventional manual documentation.

Another aspect that the synchronization of Incoterms into smart contracts will prove effective is in the process of making payments in the course of international trade. Conventionally, the process of payment in international trade transactions is fraught with a lot of risks; hence, parties are very meticulous and careful with the payment methods. Commonly, importers make payments after goods are received[18]. Invariably, the most secured payment method for the importer is most likely the least secure for the exporter and vice versa. The known methods of payment in international trade contracts are: Cash in advance, letter of credit, documentary collection, open account terms, the consignment and trade finance (Sang Man Kim, 2021).

[18] Djon Ly, 5 Common Payment Methods and Terms for International Trade. Statrys, (September 11, 2022, 1: 15 PM WAT). https://clck.ru/3BegmU

It is not uncommon for disputes to spring up at this point in a transaction. A good example of things going wrong in the course of an international trade transaction is in the case of Comptoird'Achar v. Luis de Ridder[19] where rye sold by Argentine sellers to some Belgian buyers under Cost Insurance and Freight (CIF) Incoterms failed to reach the latter despite the full payment of all fees. This transaction resulted in a lot of dispute snowballing into the courtroom when the buyers requested for a refund. This kind of incidents could have been avoided if the entire agreement terms were smartly done by encoding them into series of blockchains that will automatically disburse the funds when the terms have all been fulfilled. Smart contracts can regulate transaction payments through one of this linkage clause types – conditional effective type, contract joint type, and contract link type[20]. However, in the case of international trade transactions, the conditional effective type is the most suitable. In it, money can only be transferred when certain predefined conditions are met[21]. With this secured method of payment, the insecurities of all parties in a transaction will be allayed and the extra costs incurred in the process of making payment through traditional methods will be obviated, hence, facilitating smooth transactions.

4. Transformation of international trade: on the renovated technological configuration of Incoterms

Today, smart contracts are a prototypical example of Amara's Law, the concept articulated by Stanford University computer scientist Roy Amara that we tend to overestimate new technology in the short run and underestimate it in the long run[22]. Although smart contracts are still nascent, they have the potential of revolutionizing the reward structure and incentive system that will define the state of contracting parties in time to come. While it is true that they are yet to fully evolve to carry out complex commercial transactions, experts are optimistic about their potential to change the nature of business transactions entirely[23].

In international trade transactions, smart contracts do not just have the potential to minimize the level of risks involved, but can also create the platform for people across continents to engage in trade without having to go through the long correspondences that ensue before the execution of contract terms begins. In the aspect of risk management,

19 Comptoird'Achar v. Luis de Ridder, (1949) 1 ALL E.R. 26.

20 Xinyuan Ge. (2021). Smart Payment Contract Mechanism Based on Blockchain Smart Contract Mechanism. Scientific Programming, 2021. https://doi.org/10.1155/2021/3988070

21 Weber, I., & Staples, M. (2021). Programmable Money: Next-Generation Conditional Payments Using Blockchain. Proceedings of the 11th International Conference on Cloud Computing and Services Science (Vol. 1, pp. 7–14). https://doi.org/10.5220/0010535800070014

22 Levi, S., & Lipton, A. (2018, May 26). An Introduction to Smart Contracts and their Potential and Inherent Limitations, Harvard Law School Forum on Corporate Governance. https://clck.ru/3Begbw

23 McDonald, E. (2021, November 5). Smart Contracts. Columbia Business Law Review. https://clck.ru/3BegTr

the insurance industry could also leverage on smart contracts to create premium packages that pay out in the event of unfortunate eventualities, without the hassle of navigating through a prolonged and costly claim validation process[24].

Even supply chains could also be managed by smart contracts. Smart contracts have the potential of getting rid of factors that tend to strain the efficiency of supply chains in international trade – the issue of trust and coordination[25]. The solution that smart contracts can provide to attend to the issue of trust and coordination along international supply chains includes developing, at an affordable management cost, a control system that can direct the supply chain's overall goals in order to achieve a greater common good medium-term as opposed to the current situation where each participant pursues, on its own behalf, lower but immediate returns. Acting as an enabling technology, smart contracts will redefine supply chain management in international trade by occasioning an increased collaboration between international actors across supply chains, which, by extension, will enhance the economic health of participating businesses.

With all the amazing prospects that smart contracts hold, their manifestation cannot take place in vacuum. Certain frameworks and regulations need to be put in place before the vast benefits of smart contracts can be brought into fruition. It is in view of this fact that we recommend the following measures that would enhance a global economic environment where smart contracts can thrive.

Amendment of Incoterms. Smart contracts in the domain of international trade will gain more reception if the International chamber of Commerce (ICC) should amend the Incoterms and empower it as a medium of framing export/import contracts. The formulation of an international legal framework will validate smart contracts as a safer method of framing trade contracts where parties have more control over the pulse of the transaction. This formal acknowledgement of smart contracts will create a favourable business climate for its evolution within the space of international trade.

Creation of a global export/import trade oracle. "Smart contracts cannot directly take input data from (sic) the real world, they must get that data from sources already on the Blockchain"[26]. It is to this end that oracles come into play. An oracle is the bridge linking off-chain information and on-chain information[27]. It serves as an on-chain Application Programming Interface (API) that parties to a smart contract can query for certain information. The role of oracles in smart contracts is to facilitate complex real-life activities such as finding data online –stock prices, temperature data, insurance, price reports, et cetera.

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24 Ibid.

25 Bottoni, P., Gessa, N., Massa, G., Pareschi, P., Hesham, S., & Archuri, E. (2020, November 26). Intelligent Smart Contracts for Innovative Supply Chain Management. Frontiers in Blockchain. https://doi.org/10.3389/fbloc.2020.535787

26 McDonald, E. (2021, November 5). Smart Contracts. Columbia Business Law Review. https://clck.ru/3BegTr

27 Mojtahedi Arshia. A Guide to Oracles: What Are They, Types and Use Cases, AI Multiple, (12 September 2022, 2: 12 PM).

Considering the important role of oracles as a catalyst for smart contracts, the creation of a special system of oracles strictly for the propagation of export/import trade contracts will lay a solid foundation for the growth of smart contracts in the realm of international trade. The creation of this system of oracles will enable contracting parties to insert Incoterms of their choice in their contracts on series of blockchains, and would still be able to perform other functions that are rationed amongst intermediaries.

Conclusion

Smart contract is a revolutionary concept that will change the landscape of the corporate world. Its features will remedy the flaws and shortcomings of traditional contracts. In the same vein, smart contracts will eradicate the systemic difficulties concomitant with the reliance on third parties in the process of contract execution. In the domain of international trade, the prevalence of smart contracts will not just ease the course of transactions alone, but will also reset the pulse of international trade transactions by giving contracting parties more control over their object of contract. Unlike traditional international trade contracts that are fraught with the far-reaching interference of third parties acting in different capacities, smart contracts synthesize the roles of third parties into series of blockchains that operate based on the agreed terms of the parties, encoded in them.

Hemming loose edges that are common in traditional contracts, the reliance on smart contracts will not just fasten the execution process of international trade contracts, but it will also allay the fears of being outsmarted in a transaction. Given the porous nature of international trade contracts, smart contracts will suffice to facilitate certainty in the agreement execution, thsu easing the process of doing business worldwide. Therefore, in order to enhance more efficiency in the world of trade and business, an updated technology-friendly configuration of Incoterms can take us to new heights of developments.

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Применение смарт-контрактов в сфере международной торговли и перспективы дальнейшей эволюции Инкотермс

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Ключевые слова

децентрализованные финансы (DeFi),
Инкотермс,
контракт,
международная торговля,
международное право,
право,
смарт-контракт,
технология блокчейна,
цифровизация,
цифровые технологии

Аннотация

Цель: выявить перспективы международной торговли в свете синхронизации положений Инкотермс со смарт-контрактами.

Методы: в основе исследования лежат общенаучные методы анализа, синтеза, сравнения, а также формально-юридический метод, необходимый для анализа положений Инкотермс.

Результаты: авторами проанализированы положения Инкотермс и технологические новации в торговом праве; показана связь между практикой торгового права и технологическим развитием, обусловленная включением условий договора в блокчейн. Отмечается, что интеграция технологии блокчейн со смарт-контрактами привела к разнообразию автоматизированных бизнес-транзакций и созданию платформы для торговли синтетическими активами. Раскрыты возможности безопасного и простого осуществления сделок в международной торговле с помощью технологии блокчейн. Несмотря на уникальность данной технологии, выделяются различные ее виды, а именно: публичный, частный, гибридный и консорциумный блокчейн. Обосновано, что синхронизация положений Инкотермс со смарт-контрактами может изменить перспективы международной торговли (особенно экспортно-импортных контрактов) в лучшую сторону. Подчеркивается, что на основе технологии блокчейн смарт-контракты могут произвести революцию в применении Инкотермс, и, как следствие, повысить эффективность транзакций между сторонами экспортно-импортных отношений. Одно из фундаментальных изменений, которое смарт-контракты внесут в данные торговые операции, заключается в сокращении количества ошибок и неправильного толкования правил Инкотермс.

✉ Контактное лицо

Авторы на конкретных случаях демонстрируют возникающие на этапе заключения сделки и ее исполнения споры, которые можно было бы избежать посредством использования современных технологий.

Научная новизна: показаны феномен синхронизации Инкотермс с технологией блокчейн и то, как это может повлиять на форму контрактов и способствовать их беспрепятственному исполнению. Предложенный подход к анализу феномена учитывает революционные инновации в трансграничной торговле, которые сравниваются с обычными способами применения Инкотермс в традиционных международных торговых контрактах.

Практическая значимость: проведенное исследование содержит предложения и рекомендации для дальнейшего развития инноваций в области смарт-контрактов, особенно экспортно-импортных торговых контрактов в глобальном масштабе.

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