

Smart Contract as a New Instrument of Islamic Economic Diplomacy in the Blockchain Era

Kaslam¹; Amalthia Parah Rezky², A. Muhammad Fuad Ansari³, Corana Chusnul Chatimah⁴, Muhammad A'afi Azharan Fauzi⁵

Universitas Islam Negeri Alauddin Makassar, Indonesia^{1,2,3,4,5}

Email : etos.kaslam@uin-alauddin.ac.id¹

Abstract

This article examines the role of smart contracts as an innovative instrument supporting Islamic economic diplomacy in the blockchain era. Blockchain technology, characterized by transparency, efficiency, and security, offers solutions aligned with the principles of Islamic economics, such as justice, honesty, and openness. The research aims to explore the potential use of smart contracts in accelerating international economic transactions compliant with Sharia law, while also identifying the challenges and opportunities for their global implementation. The study adopts a descriptive-analytical approach, combining secondary data from reports, case studies, and empirical analyses. One of the key findings is that smart contracts can streamline international trade and cross-border investment processes by reducing administrative costs, speeding up transaction settlements, and eliminating third-party risks. Case studies on the application of smart contracts in managing international zakat and halal investments demonstrate that this technology enhances trust and accountability among parties. The article also identifies several obstacles, including limited technological literacy, regulatory challenges, and cultural resistance in Muslim-majority countries. However, through collaboration between governments, private sectors, and international organizations, blockchain technology can be integrated into the framework of Islamic economic diplomacy to strengthen international relations. In conclusion, smart contracts represent a potential instrument to transform Islamic economic diplomacy, making it more relevant and competitive in the digital era. The study recommends developing Sharia-compliant technology regulations and promoting digital education as strategic steps toward integrating blockchain into the global Islamic economy.

Keywords: Smart Contract, Islamic Economic Diplomacy, Blockchain, Digital Finance, Global Transactions.

Introduction

With the rapid development of digital technology, blockchain has emerged as one of the greatest innovations transforming paradigms across various sectors, including the global economy. Blockchain was first introduced in 2008 by an individual using the pseudonym Satoshi Nakamoto as part of the digital currency system Bitcoin (Narayanan et al., 2016). Although Bitcoin initially garnered most of the attention, over time, blockchain technology began attracting interest as a foundational

infrastructure with far greater potential than merely serving as a tool for digital currency transactions. Blockchain enables decentralized, secure, and transparent transaction recording without the need for third parties or central authorities, making it highly appealing for application across various economic sectors.

Blockchain technology functions as a distributed digital ledger, where all transactions are recorded in blocks and arranged sequentially (Yıldırım, 2018). Each newly added block is verified and protected with robust cryptographic systems, making it nearly impossible to manipulate or alter. The main advantages of blockchain lie in its transparency, security, and decentralization, which eliminate the need for intermediaries in transactions. This enables the creation of a more efficient and secure economic system, especially in international transactions that often involve multiple parties and carry high risks related to trust and data security.

On top of blockchain technology, the concept of smart contracts has emerged. A smart contract is a computer program that automatically executes, controls, or documents an agreement or transaction when certain conditions are met (Rajput et al., 2023). Unlike traditional contracts that require third parties such as notaries or lawyers, smart contracts operate automatically on blockchain, reducing costs and increasing execution speed. Smart contracts enable agreements between two parties to be executed without human intervention, thereby minimizing the possibility of errors and enhancing efficiency.

In the context of the global economy, smart contracts offer significant potential to simplify and accelerate international transactions, including cross-border trade, payments, and the exchange of goods and services. By implementing smart contracts, processes that traditionally involve numerous parties and lengthy procedures can be streamlined. For instance, in international trade, smart contracts can ensure that payments are made only after goods are delivered as agreed. This provides security for all parties involved, reduces the risk of disputes, and enhances transparency in transactions (Purcell et al., 2018).

One promising sector for transformation by blockchain technology and smart contracts is Islamic economics, which is guided by Sharia principles emphasizing justice, transparency, and prohibitions against usury (*riba*), uncertainty (*gharar*), and gambling (*maysir*) (Septianda et al., 2022). In Islamic finance, transactions must be based on fair and transparent principles. Blockchain technology, with its decentralized and transparent nature, allows Sharia-compliant transactions to be better recorded and monitored. Additionally, smart contracts can automatically execute agreements that adhere to Sharia principles, such as avoiding *riba* or ensuring all parties fulfill their obligations.

Blockchain has begun to be applied in the Islamic finance sector, particularly to introduce greater transparency and security in transactions. For example, in Islamic financial products like sukuk (Islamic bonds) and zakat (charitable donations), blockchain can be used to monitor the flow of funds in real-time and ensure that funds are utilized for legitimate purposes (Rejeb, 2020). The application of smart contracts in these products can also ensure that payments are executed automatically as per agreed terms, reducing potential injustices and disputes among the involved parties.

In this digital era, economic diplomacy has transformed alongside technological advancements (Pratiwi, 2017). Countries worldwide increasingly depend on international cooperation in economics and trade, with technologies like blockchain and smart contracts

becoming critical tools for accelerating and facilitating international transactions. Digital economic diplomacy focuses not only on policies and trade agreements but also on the management and implementation of technologies that can strengthen economic relations between countries. By leveraging smart contracts, nations can establish more efficient, secure, and transparent transactions, thereby enhancing their economic cooperation.

In the context of Islamic economic diplomacy, blockchain can serve as a novel instrument to enhance trust among Islamic nations in conducting economic transactions. For instance, countries operating based on Sharia principles could leverage this technology to strengthen their international payment systems, reduce dependency on conventional financial systems, and create a more equitable and transparent global market. Smart contracts can ensure that cross-border transactions involving Sharia-compliant products or services are processed in a fully automated and transparent manner (Arwani & Priyadi, 2024).

While blockchain and smart contract technologies offer numerous advantages, their implementation in Islamic economic diplomacy faces several challenges (Fitri, 2023). One of the key challenges is the lack of technical knowledge and skills among policymakers and practitioners in Islamic finance. Additionally, despite blockchain's decentralization and transparency, concerns remain regarding inadequate regulations and the potential misuse of this technology for illicit purposes such as money laundering or terrorism financing. Moreover, integrating blockchain-based financial systems with existing traditional systems in many countries presents a significant hurdle.

Despite these challenges, the future of blockchain and smart contract technologies in Islamic economic diplomacy is highly promising. With the increasing adoption of digital technologies among developing countries, particularly in the Islamic world, blockchain could enhance efficiency and security in international economic transactions. Through international collaboration and the development of supportive policies, blockchain and smart contracts could become highly effective instruments for fostering a more equitable and transparent global economic ecosystem in alignment with Islamic economic principles. These innovations have the potential to create new opportunities for economic cooperation between nations and strengthen Islamic economic diplomacy in the digital era.

Islamic economic diplomacy refers to diplomatic efforts by predominantly Muslim nations to promote economic values aligned with Sharia principles. Globally, Islamic economic diplomacy aims to enhance intergovernmental economic cooperation, strengthen Islamic financial systems, and foster trade and investment rooted in justice and transparency (Arwani & Priyadi, 2024). This diplomacy goes beyond international trade policies, encompassing the management of Sharia-compliant economic resources such as zakat, waqf, and sukuk (Islamic bonds).

Islamic economics is grounded in fundamental principles that distinguish it from conventional economic systems. These principles include justice, sustainability, and transparency in economic transactions. Islamic economics prohibits practices such as *riba* (interest), *gharar* (uncertainty), and *maysir* (gambling), which are often present in traditional financial systems. Moreover, it emphasizes collective human welfare, with a particular focus on social justice and equitable wealth distribution. In the context of economic diplomacy,

Islamic countries aim to establish collaborations that support these objectives, encompassing trade, investment, and Islamic financial institutions.

Technology plays a crucial role in accelerating and facilitating the implementation of Islamic economic diplomacy at the international level. In this digital era, the adoption of information and communication technology enables Muslim nations to enhance the efficiency of trade, investment, and international financial transactions. Digital technologies such as blockchain and smart contracts offer potential benefits in improving transparency, security, and fairness in transactions conducted according to Sharia principles. This can strengthen the credibility of the Islamic economic system and create opportunities for Islamic nations to expand their influence in the global market.

Islamic finance faces challenges in adapting to rapid technological advancements. Traditional Islamic finance operates on conservative principles that prohibit elements like *riba* and speculation. However, in the digital era, numerous innovations such as fintech (financial technology) have emerged, which can be applied to Islamic financial systems. These innovations include digital payments, peer-to-peer lending, and app-based investments, offering quicker and easier access to Sharia-compliant transactions. Therefore, Islamic economic diplomacy must involve the management and implementation of secure and legitimate financial technologies, as well as the development of appropriate regulations to support the integration of digital financial systems into the Islamic economy.

One of the main challenges in adopting technology within Islamic economic diplomacy is uncertainty regarding the acceptance and understanding of new technologies, particularly in countries with more conservative Sharia legal systems. For instance, implementing blockchain and smart contracts in Sharia-based financial transactions requires a deep understanding of how these technologies can ensure compliance with Islamic principles, such as the prohibition of *riba* and *gharar*. Additionally, adopting these technologies demands significant investments in digital infrastructure, human resource training, and regulatory development – challenges that are particularly daunting for many Muslim-majority nations still in the developmental phase.

The aim of this article is to explore the potential of smart contracts as a new instrument in Islamic economic diplomacy in the blockchain era and how this technology can strengthen economic relations between countries within the framework of Islamic economic principles. Smart contracts, as systems that automate the execution of transactions based on pre-established rules, offer the much-needed transparency, efficiency, and security in an increasingly interconnected and digitalized international economy. In the context of Islamic economics, principles such as justice, transparency, and the prohibition of practices like *riba* (interest), *gharar* (uncertainty), and *maysir* (gambling) serve as the foundational guidelines in the formation of transaction systems. Therefore, this exploration aims to understand how smart contracts can ensure that all international transactions carried out by Muslim countries fully comply with Sharia principles and how this technology can be utilized to enhance trust, reduce transaction costs, and expedite economic cooperation between Islamic countries.

The research question posed in this article is: How can smart contract technology be an effective tool in enhancing international economic cooperation within the framework of Islamic economic principles? In a world increasingly dependent on digitization, smart

contracts have significant potential to accelerate and simplify transactions between countries, whether in international trade, investment, or other economic projects. However, the main challenge is how to ensure that the use of this technology does not violate Sharia law, particularly concerning Islamic financial principles that prohibit *riba* and excessive uncertainty. Thus, this research aims to explore the potential and challenges of applying smart contracts in Islamic economic diplomacy, as well as to offer practical solutions that can support the integration of this technology into the broader Islamic economic system.

Method

This study is descriptive-analytic with a qualitative approach, aimed at providing a detailed description and analysis of the use of smart contract technology in Islamic economic diplomacy in the blockchain era. The research will explore how smart contracts are applied within the context of Islamic economics, including in international transactions, intergovernmental cooperation, and the management of Islamic finance. The qualitative approach enables the research to examine this phenomenon in-depth and holistically, understanding the dynamics involved, as well as assessing the potential and challenges that arise (L.J. Moleong, 2022). This study will not only describe the technical aspects of smart contract use but also analyze its impact on the principles of Islamic economics and how this could influence economic diplomacy between Muslim countries on an international level.

The data collection techniques used in this study include literature review, document analysis, and case studies of smart contract implementations in economic diplomacy. The literature review will be used to explore theories and prior research related to blockchain technology, smart contracts, and their application in Islamic economics and international diplomacy. Document analysis will involve reviewing policies and regulations related to the use of digital technology in economic diplomacy. Meanwhile, case reviews will provide concrete examples of how smart contracts have been implemented in various countries in the context of Islamic economics.

The focus of this research is to analyze how smart contracts are utilized in Islamic economics at the international level and to explore their potential in strengthening economic diplomacy among Islamic countries. In data analysis, a thematic approach will be applied to identify and analyze the impacts and challenges of implementing this technology, as well as how these can lead to solutions that align with Islamic economic principles.

Literatur Review

Concept of Smart Contracts

A smart contract is a computer program that automatically executes and enforces the terms of an agreement between involved parties without the need for intermediaries or a central authority. Unlike traditional contracts, which rely on third parties such as lawyers or notaries to enforce agreements, a smart contract operates automatically and directly on blockchain technology. These contracts are designed to ensure that the terms of an agreement between the two parties, such as payment or delivery of goods, are fulfilled according to the previously agreed-upon conditions. This technology allows transactions and agreements to be processed transparently, securely, and without the involvement of costly or risky intermediaries. In the blockchain ecosystem, smart contracts ensure that all

parties involved can only perform verified and legitimate transactions, according to predefined parameters.

Smart contracts have several key features that distinguish them from traditional contracts. First, autonomy: once a contract is activated, its execution and oversight are entirely managed by the blockchain system without requiring third-party intervention. Second, security: smart contracts operate on blockchain platforms that use cryptography to ensure the security of transaction data, making it impossible to alter once received by the network. Third, transparency: all transactions made using smart contracts are recorded in a publicly distributed ledger, providing access for all interested parties to verify the transaction. Fourth, efficiency: smart contracts automate many aspects of the transaction process, reducing the need for manual procedures and oversight, which are often time-consuming and costly. These features make smart contracts highly efficient in accelerating transactions and reducing the risk of non-compliance or fraud.

Smart contracts function within the blockchain ecosystem in a highly structured manner. When an agreement is made between two parties, the code or program containing the rules of the agreement is inserted into the blockchain. The smart contract is then executed based on conditions, known as "triggers." For example, in a goods sale agreement, a smart contract will specify that payment is only made after the goods are shipped and received by the buyer. Once the specified conditions are met, the blockchain verifies the transaction, and the smart contract automatically executes payment to the seller. All these transactions are recorded in the immutable blockchain ledger, providing transparency and security for all involved parties.

The primary advantage of using smart contracts within the blockchain system is their reliability and efficiency. Since smart contracts operate automatically, the risk of delays or human errors can be minimized. Additionally, the automated execution reduces the need for third parties, who typically charge for their services, thereby lowering transaction costs. Decentralization is another advantage of smart contracts, as they operate on a decentralized blockchain network, removing dependence on centralized institutions or entities that could cause disruptions or biases. Furthermore, the guaranteed transparency of blockchain makes smart contracts accessible and verifiable by all stakeholders, ensuring that transactions are conducted fairly and in line with the previously agreed terms.

Smart contracts can be applied in various sectors, including finance, logistics, healthcare, and government, as well as in the increasingly important field of Islamic economics. In the financial world, for example, smart contracts are used to facilitate faster and more secure transactions, such as in blockchain-based payment systems or stock markets. In the logistics sector, smart contracts enable automatic verification of goods delivery and real-time logistics tracking, reducing the potential for fraud or delays. In the context of Islamic economics, smart contracts can ensure that all transactions are carried out in accordance with sharia principles, such as avoiding *riba* (interest) and *gharar* (excessive uncertainty). These benefits make smart contracts a highly potential tool in creating more efficient, secure, and transparent systems, both in domestic and international markets.

Blockchain and the Digital Economy

Blockchain is a decentralized and distributed digital ledger that allows transactions to be recorded and verified securely without the need for trusted third parties. The technology consists of data blocks that are connected to one another through cryptography, creating a chain of secure and transparent information. Blockchain is not only used for digital currency transactions but has also been applied across various sectors such as logistics, healthcare, and finance. As blockchain use expands, a new application called smart contracts has emerged, allowing automatic execution of agreements without third-party intervention.

Blockchain technology has a significant impact on the global financial system, enhancing efficiency, security, and transparency. One of the most notable effects is its ability to reduce reliance on traditional financial institutions such as banks and transaction settlement institutions, which typically serve as intermediaries in cross-border transactions. Blockchain allows transactions to be conducted directly between two parties without the need for an intermediary, reducing transaction costs and time. The security guaranteed by blockchain also makes it an essential tool for mitigating risks such as fraud, money laundering, and embezzlement, which are common in conventional financial systems. Transactions recorded on the blockchain are transparent and immutable, ensuring that all transaction-related information can be monitored and verified by authorized parties.

Blockchain is changing the paradigm of the digital financial system. In traditional business models, financial institutions such as banks, insurance companies, and capital markets serve as intermediaries that ensure the smooth and legitimate execution of transactions. However, with blockchain technology, this model is shifting toward decentralization, where transactions can be conducted directly between involved parties without the need for a central authority. Additionally, blockchain technology enables the creation of more efficient and cost-effective global payment systems, using cryptocurrencies such as Bitcoin, Ethereum, or stablecoins. With this technology, high international transaction costs and time-consuming processes can be significantly reduced, creating a new model for global payment systems that is faster, cheaper, and more inclusive.

Although blockchain technology offers numerous benefits, its use in the global financial system also faces challenges, particularly in terms of regulation. Many countries are still formulating appropriate regulations to govern blockchain usage, especially regarding cryptocurrencies and cross-border transactions. Some countries have begun implementing regulations that recognize cryptocurrencies as legitimate assets or payment methods, while others still prohibit their use. Clear regulations and harmonization between countries regarding how to regulate blockchain and cryptocurrency are crucial to maintaining global market stability and preventing misuse of the technology, such as money laundering or terrorism financing. Therefore, international cooperation is needed to establish regulatory standards that facilitate the global adoption of blockchain technology.

One of the major benefits of blockchain technology is its ability to enhance financial inclusion, particularly in developing countries. Many people around the world, especially in countries with unstable or underdeveloped financial systems, lack access to traditional

banking services. With blockchain and cryptocurrency, individuals can conduct financial transactions and access financial services without the need for banks or other financial institutions. This creates significant opportunities for populations that were previously excluded from the global financial system. Blockchain technology enables the creation of a more inclusive payment system, which can help reduce economic and social disparities in developing countries by providing more people with access to the global digital economy. Furthermore, blockchain can improve asset management, such as property or loans, which can provide more opportunities for communities that do not have access to conventional financial resources.

In the context of Islamic finance, blockchain technology also holds great potential for application. Blockchain can help reduce practices that are contrary to sharia principles, such as *riba* (interest), *gharar* (excessive uncertainty), and *maysir* (gambling). With smart contracts, for example, transactions can be executed automatically according to previously agreed terms, ensuring that no elements of *riba* or uncertainty are involved in the transaction. Additionally, blockchain can improve transparency in Islamic financial transactions, which is crucial for ensuring that all parties involved can verify the legitimacy of transactions and compliance with sharia principles. Thus, blockchain can be a highly effective tool for strengthening the Islamic financial system in the digital era, providing solutions for the challenges faced by sharia-compliant financial institutions in managing transactions according to Islamic law.

Although blockchain presents various opportunities to transform the global financial system, several challenges still need to be addressed to fully realize its potential. Some of these challenges include scalability, wider adoption, and the need for better infrastructure to support blockchain transactions. Moreover, regulatory and security concerns are also major considerations in developing this technology. However, with rapid technological advancements and increasing investments in blockchain research and development, the opportunities to leverage this technology more widely in the global financial system are growing. In the future, blockchain is expected to become increasingly integrated into traditional financial systems, creating a more secure, efficient, and inclusive digital financial ecosystem.

Islamic Economic Diplomacy

Islamic economics is grounded in principles derived from the Qur'an, Hadith, and *fiqh* (Islamic jurisprudence). The core principles of Islamic economics include social justice, balance between rights and obligations, and the sustainable well-being of humanity. One of its most fundamental foundations is the prohibition of *riba* (interest), which is seen as an exploitative practice. Additionally, Islamic economics emphasizes the prohibition of *gharar* (uncertainty) and *maysir* (gambling), both of which involve elements of speculation and risk that harm the parties involved in transactions. In Islamic economics, every transaction must be based on values of honesty, transparency, and fairness, aimed at preserving the integrity of transactions, preventing injustice, and supporting economic development based on moral and ethical values.

Justice is a key principle in Islamic economics and serves as the basis for various economic transactions, including in the context of economic diplomacy. In international relations, justice means that every country, regardless of its size or economic power, has an equal right to benefit from economic transactions and international cooperation. Islamic economic diplomacy strives to create equality in relationships between nations, avoiding practices that harm or unfairly exploit others. Therefore, within the framework of Islamic economic diplomacy, international agreements and economic cooperation should be structured to uphold the principle of justice, ensuring fairness not just for large nations, but also for developing countries, which often find themselves in less favorable positions.

Another notable principle in Islamic economics is social responsibility or moral obligations towards others. In the context of Islamic economic diplomacy, this means that every country involved in international economic relations must consider the social impact of every economic decision made. Islamic economic diplomacy emphasizes the alignment between economic gain and social welfare. This can be reflected in various international policies, such as providing aid to needy nations, fulfilling human rights, and implementing fair economic policies that benefit all layers of society. In this framework, Islamic countries are expected not only to pursue economic gains but also to commit to sustainable and inclusive social development.

Transparency and accountability are also crucial principles in Islamic economics to maintain the integrity of transactions and avoid corruption or fraud. Islamic economic diplomacy demands economic management that is transparent, where every nation must be accountable for its economic actions and policies to its people and international partners. With transparency, all parties in international economic relations can understand and verify the terms and goals of any agreement, reducing the potential for misunderstanding or conflicts in the future. In this context, technologies such as blockchain, which offer transparent and secure transaction systems, have great potential to support Islamic economic diplomacy by ensuring that each transaction and agreement can be monitored and accounted for clearly.

Sustainability is another important principle emphasized in Islamic economics, teaching that economic development must consider sustainability and balance between the needs of the current and future generations. In Islamic economic diplomacy, this means that every international economic agreement or policy should consider its long-term impacts on the environment, natural resources, and society. Islamic countries are encouraged to cooperate in developing infrastructure that supports sustainable and environmentally friendly development. For example, in energy or agriculture cooperation, Islamic countries could focus on investing in green technologies or sustainable farming practices to preserve natural resources for future generations. Applying the principle of sustainability in Islamic economic diplomacy can also open opportunities for Islamic countries to take a leading role in global initiatives addressing climate change and other environmental challenges.

In the context of international relations, Islamic economic diplomacy emphasizes the importance of collaboration among nations to create a just and sustainable global economic system. Islamic countries are expected to work together to strengthen their position in the

global economy while adhering to the principles of Islamic economics based on justice and balance. This collaboration can occur through various platforms, such as the Organization of Islamic Cooperation (OIC) or through bilateral agreements based on mutual respect and fairness. Furthermore, Islamic economic diplomacy encourages cooperation with non-Islamic countries that share similar visions of economic justice, social development, and environmental sustainability. By upholding Islamic values in economic diplomacy, Islamic countries can actively contribute to shaping global economic policies that are more equitable and beneficial for all of humanity.

With advancements in technology and globalization, Islamic economic diplomacy faces new challenges, particularly in the digital age. Technological developments such as blockchain, cryptocurrency, and digital trade open up new opportunities but also bring challenges related to regulation, security, and the application of sharia principles in digital transactions. Islamic countries must ensure that digital transactions comply with sharia law, such as avoiding elements of *riba*, *gharar*, and *maysir*. Therefore, it is important for Islamic countries to develop policies and infrastructure that support a digital economy in line with Islamic economic principles. Additionally, international collaboration in developing global standards for sharia-compliant digital economies is also a crucial challenge for Islamic economic diplomacy in this blockchain era.

Islamic economic diplomacy provides an opportunity for Islamic countries to play a larger role in the global economy. By promoting principles of justice, transparency, and sustainability, Islamic countries can offer a more ethical and equitable alternative to the global economic system, which is often dominated by major countries and international financial institutions. With a population of over one billion people and abundant natural resources, Islamic countries have significant potential to become a powerful economic force in the world. Therefore, it is important for Islamic countries to strengthen their economic cooperation through economic diplomacy based on Islamic principles, thereby improving the welfare of their people and strengthening their position in the global economy.

Integration of Blockchain in Islamic Economy

The integration of blockchain in the Islamic economy holds significant potential to enhance efficiency, transparency, and fairness across various sectors, including halal transactions and Islamic finance. Blockchain technology, which enables decentralized and secure transaction recording, can address many issues in traditional Islamic financial systems, such as uncertainty (*gharar*) and injustice (*zalim*). By utilizing blockchain, all transactions can be permanently and transparently recorded in an immutable ledger, ensuring that every step of the transaction complies with Sharia principles. In the context of halal transactions, blockchain can help avoid practices that contradict Islamic law, such as transactions involving unlawful (*haram*) goods or *riba* (usury), by providing a clear and guaranteed audit trail.

Blockchain can optimize the halal transaction verification system within the Islamic economy. In the buying and selling of halal goods or services, blockchain enables automatic verification that the products being transacted meet halal requirements in accordance with Sharia standards without relying on third parties. For instance, in food product trade,

blockchain can be used to trace the origins of ingredients, ensuring they are not contaminated with prohibited elements and that the production process adheres to Sharia rules. Additionally, blockchain can ensure that financial transactions within the Islamic finance sector, such as investments and financing, are entirely free from *riba* or excessive speculation (*maysir*) by enforcing transparency and security at every stage of the transaction.

One intriguing innovation in applying blockchain to the Islamic economy is the use of smart contracts in Islamic finance. Smart contracts are codes or programs that automatically execute transactions based on pre-defined conditions without requiring third-party intervention. In the context of Islamic finance, smart contracts can be used to ensure that every financing agreement, such as *murabahah*, *mudarabah*, or *ijarah*, is executed in compliance with Sharia principles. For example, in a *murabahah* contract, a smart contract can automate the buying and selling transaction, ensuring that the price of the goods remains transparent and free from interest or exploitation. With smart contracts, the risk of non-compliance with Sharia principles can be minimized because all transactions are programmed to strictly adhere to Islamic laws.

A major challenge in Islamic finance is ensuring that transactions and investments are conducted transparently and accountably in line with Sharia principles. Blockchain offers a highly effective solution in this regard. Since blockchain records all transactions openly on a ledger accessible to all relevant parties, it provides a high level of transparency essential to the Islamic financial system. All parties involved in a transaction can verify its validity and compliance with Sharia principles, such as the prohibition of *riba*, *gharar*, and *maysir*. This transparency allows Islamic financial institutions to avoid potential fraud or manipulation that could harm customers or investors and ensure that invested funds are genuinely used for lawful and beneficial purposes.

Although blockchain technology offers various potentials to develop a more efficient, fair, and transparent Islamic economy, its implementation also faces challenges that need to be addressed. One major challenge is the gap in understanding and adopting this new technology among Islamic financial institutions and regulators. Many Muslim-majority countries have yet to fully understand or embrace the potential of blockchain, particularly in its application to Islamic financial systems. Furthermore, while blockchain can improve efficiency and security, there are also issues related to scalability, cost, and the need for appropriate regulations to enable its broad acceptance and implementation. Overcoming these challenges requires collaboration among Islamic countries, Islamic financial institutions, and technology experts to establish clear regulations and develop standards that ensure blockchain can be applied in accordance with Sharia principles without compromising justice and sustainability.

The Potential of Smart Contracts in Economic Diplomacy

Smart contracts are computer programs that automatically execute and manage agreements between involved parties based on predefined rules. In the context of economic diplomacy, smart contracts offer the potential to enhance efficiency, transparency, and fairness in international economic cooperation. The theory behind smart contracts centers on the principle of decentralization, allowing parties involved in international economic

relations to conduct transactions without needing third-party intermediaries. Using blockchain as infrastructure, smart contracts ensure that every step of an international agreement is recorded clearly and securely, reducing the risk of fraud and preventing disputes that often arise in traditional economic agreements involving multiple parties. In economic diplomacy, this enables countries to build greater trust, as all transactions can be verified, ensuring that no party is disadvantaged.

One of the most significant potentials of smart contracts in economic diplomacy is their ability to improve efficiency in international economic cooperation. For example, in trade agreements between countries, smart contracts can automate contract execution, such as the delivery of goods or payments. This reduces the time required for administrative processes and decreases transaction costs typically associated with intermediaries or mediators. Countries can use smart contracts to create more complex agreements, such as infrastructure partnerships or inter-country investments, which automatically execute payments or deliver goods based on mutually agreed conditions. Thus, smart contracts reduce reliance on central authorities or intermediary institutions, often bottlenecks to swift and efficient implementation in international economic relations.

Security and compliance with agreements are critical issues in international economic diplomacy. Smart contracts, operating on blockchain, provide an additional layer of security by ensuring that every transaction between countries or parties in international cooperation is permanently recorded and immutable. This minimizes the risk of fraud, misuse, and disputes that often arise from ambiguities or inconsistencies in agreement implementation. In this context, smart contracts also ensure that all parties in an international economic agreement adhere to the agreed terms, as contracts are executed automatically when specific conditions are met. For instance, in energy or natural resource purchase agreements between countries, payments or deliveries are made automatically once certain conditions are fulfilled, eliminating the need for further authorization from third parties. This not only speeds up agreement implementation but also creates a fairer and more controlled system for international cooperation.

Several countries and international organizations are beginning to explore the use of smart contracts in their economic cooperation. For example, some European Union countries have adopted blockchain technology to streamline cross-border trade transactions and minimize bureaucratic delays. Smart contracts are used to regulate automatic payments between importing and exporting countries, ensuring that transactions occur according to agreed terms without potential delays or misuse. Additionally, some Asian countries are starting to use smart contracts in investment collaborations, where smart contracts enforce agreements between investors and partner countries, ensuring that the transferred funds are used as agreed without third-party intervention. These practices demonstrate that implementing smart contracts can expedite and simplify the execution of international economic agreements while increasing transparency and trust among parties.

Although smart contracts offer numerous benefits in economic diplomacy, their implementation also faces several challenges. One major challenge is regulation. Each country has different legal systems and regulations, and for smart contracts to be accepted

internationally, there must be agreement or harmonization of rules between countries regarding their use. Without clear regulations, applying smart contracts in international economic cooperation could create legal uncertainties that hinder cross-border collaboration. Furthermore, adopting this technology requires significant investment in secure and reliable technological infrastructure. Another challenge is the lack of understanding and knowledge about blockchain and smart contract technologies among policymakers and diplomats, which can slow the adoption process. Nevertheless, as technology advances and awareness of its benefits grows, smart contracts have the potential to become a valuable instrument in future economic diplomacy, facilitating more efficient, transparent, and secure international transactions.

Results and Discussion

The Role of Smart Contracts in Islamic Economic Diplomacy

Smart contracts, as blockchain-based technological innovations, present significant opportunities to accelerate and simplify international transactions aligned with Islamic economic principles. A smart contract is a digital protocol that automatically executes agreements based on pre-agreed codes between parties. In the context of Islamic economic diplomacy, the application of smart contracts addresses critical challenges such as ensuring transparency, fairness, and compliance with Sharia principles in cross-border transactions. These principles align with the prohibition of *riba* (usury), *gharar* (uncertainty), and *maysir* (excessive speculation), which are fundamental to Islamic economic transactions. This technology enables parties to conduct transactions directly without intermediaries, thereby reducing costs and minimizing the risk of moral hazards.

The primary advantage of smart contracts in Islamic economic diplomacy lies in their transparency mechanism. Through blockchain, each transaction is permanently recorded and immutable, eliminating opportunities for data manipulation. This is crucial in international transactions based on Islamic economics to ensure all parties adhere to Sharia principles. For instance, in international trade financing, smart contracts can be designed to ensure that payments are made only when goods or services are delivered in compliance with Sharia agreements. Empirical studies indicate that using this technology can reduce operational costs by 20-30%, offering competitive advantages to countries implementing Sharia-based economic diplomacy.

Indonesia, as one of the leaders in the Global Islamic Economy Indicator (GIEI) 2023, has a significant opportunity to leverage advanced technologies like smart contracts to support Islamic economic diplomacy. The core advantage of smart contracts lies in their transparency mechanism, where every transaction is permanently recorded on the blockchain and cannot be altered, thus eliminating the possibility of data manipulation. In Sharia-based international transactions, this mechanism ensures adherence to principles such as payments being made only after goods or services have been received according to agreements.

For example, the implementation of smart contracts in international trade financing can support initiatives like the Halal 20 (H20) Forum and improve operational efficiency by

20-30%. This provides a competitive edge for Sharia-based countries. In this context, Indonesia can lead through technological innovation to strengthen the global Islamic economic ecosystem, expand halal trade, and enhance the integrity and sustainability of cross-border transactions.

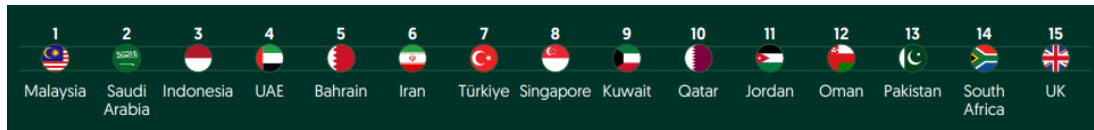


Figure 1 Global Islamic Economy Indicator Rangking 2023 (Dinar Standard, 2023)

Additionally, smart contracts can expedite the process of economic diplomacy among Islamic countries by reducing administrative and bureaucratic barriers. In conventional transactions, parties often undergo lengthy procedures involving banks, financial institutions, and regulators. By employing smart contracts, these processes can be significantly streamlined as contract execution occurs automatically once agreed conditions are met. For example, trade cooperation among member states of the Organization of Islamic Cooperation (OIC) can be facilitated through the implementation of smart contracts to simplify the management of sukuk funds, international waqf, or halal goods procurement.

However, the implementation of smart contracts in Islamic economic diplomacy requires comprehensive legal and regulatory adjustments. Many countries lack legal frameworks accommodating the use of smart contracts, let alone those tailored to align with Sharia principles. Therefore, legal harmonization among Islamic countries is essential to ensure the technology can be adopted without violating Sharia norms. This effort includes developing standardized Sharia-compliant blockchain contracts and involving Islamic scholars in the technology development process. With this approach, Islamic economic diplomacy based on smart contracts can become a globally recognized model.

Ultimately, smart contracts hold immense potential to revolutionize Islamic economic diplomacy, particularly in enhancing the efficiency and accountability of international transactions. However, the successful implementation of this technology requires multidisciplinary collaboration among technology experts, Islamic economic scholars, and regulators. By integrating Sharia principles into digital innovation, smart contracts can become a vital instrument in promoting sustainable and equitable economic growth in line with Islamic values. This implementation not only strengthens diplomacy among Islamic countries but also demonstrates that modern technology can synergize with traditional value systems to create global solutions.

Advantages of Using Smart Contracts

Smart contracts offer numerous significant benefits that support the implementation of Islamic economics, particularly through efficiency, transparency, and security in transactions. These contracts are designed to automatically execute agreements embedded in code, eliminating the need for intermediaries and making transactions faster and more cost-effective. In Islamic economics, where transactions must comply with Sharia principles,

smart contracts simplify monitoring and ensure all Sharia requirements, such as the prohibition of *riba* (usury) and *gharar* (excessive uncertainty), are met. This facilitates the creation of an economic system that is more efficient, equitable, and aligned with Islamic values.

From an efficiency perspective, smart contracts reduce bureaucracy and accelerate transaction completion. In conventional transactions, parties often undergo lengthy processes involving financial institutions, lawyers, or notaries to ensure agreements are carried out according to regulations. In contrast, with smart contracts, all transaction terms and conditions are coded and automatically executed when conditions are met. For example, in a *murabaha* contract for purchasing international goods, payment can be automatically triggered once the buyer receives the goods according to the agreed specifications. This automation minimizes delays, administrative costs, and potential disputes.

Transparency is the second advantage smart contracts bring to Islamic economics. Blockchain, the foundational technology of smart contracts, records all transaction data in an immutable form accessible to all relevant parties. This transparency is crucial in Islamic economics to ensure compliance with Sharia principles. For example, in managing *zakat* or *waqf* funds, smart contracts can be employed to record and oversee fund distribution with full transparency. Every transaction can be verified by authorities or the public, increasing trust and accountability in the management of Sharia-compliant funds.

Security is the third pillar and a key strength of smart contracts. Blockchain technology employs advanced encryption, making transaction data highly resistant to hacking or manipulation. In Islamic economics, this security ensures transactions proceed according to agreed-upon contracts and safeguards parties from fraudulent risks. For instance, in an *istisna'* contract for infrastructure development projects, smart contracts can ensure payments are made only after the construction has reached specific verified milestones. This not only enhances trust but also minimizes potential legal disputes.

These advantages highlight the immense potential of smart contracts to practically support the principles of Islamic economics. With their efficiency in reducing costs and time, transparency in enhancing accountability, and security in safeguarding transaction integrity, smart contracts can become a revolutionary tool in advancing a modern and globally competitive Islamic economic system. However, to fully leverage this potential, regulatory support and broader understanding among stakeholders – including scholars, economists, and technology developers – are essential.

Challenges and Barriers

Although smart contracts offer numerous advantages, their adoption in Islamic economic diplomacy faces several complex challenges and obstacles. Technical, social, and legal issues are among the primary barriers that must be addressed to realize the full potential of this technology. These barriers include both internal factors, such as infrastructure readiness, and external factors, such as cross-border regulatory gaps. A

comprehensive understanding and resolution of these issues are crucial to ensure that smart contracts can be widely implemented in alignment with Sharia principles.

From a technical standpoint, a significant challenge lies in the complexity of developing and implementing Sharia-compliant smart contracts. Precision in programming is essential, as errors in code could inadvertently lead to non-compliance with Sharia principles, such as involving *gharar* (uncertainty) or *riba* (usury). Additionally, the technological infrastructure in many Muslim-majority countries is not yet equipped to support widespread blockchain adoption. Limited internet access, a shortage of skilled professionals, and the high costs of developing blockchain technology are significant hurdles. In the context of Islamic economic diplomacy, where international collaboration is required, disparities in technological infrastructure can hinder consistent implementation.

Socially, cultural resistance and a lack of understanding of blockchain and smart contract technologies pose major challenges. Many stakeholders in Islamic economic diplomacy, including entrepreneurs and policymakers, have limited knowledge of how smart contracts function. Skepticism toward new technologies, particularly in communities that strongly adhere to traditional values, can hinder acceptance. Furthermore, reliance on established conventional systems often discourages economic actors from transitioning to technologies perceived as complex or unproven. To address this, education and training on the benefits and workings of smart contracts must be intensified, especially within Sharia-based business communities.

Legal aspects are also a significant obstacle to implementing smart contracts in Islamic economic diplomacy. Many countries lack clear regulatory frameworks governing smart contract usage, let alone those tailored to Sharia compliance. In complex legal systems, such as those in member states of the Organization of Islamic Cooperation (OIC), differing interpretations of Islamic law can create conflicts in smart contract applications. Moreover, cross-border regulations are often inconsistent, complicating the use of smart contracts for international transactions. For instance, some countries recognize the legality of digital documents, while others still rely on physical documents as legal evidence.

Another challenge is the need for collaboration among technology experts, Islamic scholars, and regulators to create standardized smart contracts aligned with Sharia principles. This process requires time and intensive coordination, especially given the diverse interpretations of Islamic law across jurisdictions. Additionally, consumer protection is a concern, as poorly designed smart contracts could disadvantage one party in a transaction. Comprehensive regulations and Sharia oversight are therefore essential to ensure that smart contracts are not only technically secure but also legally valid under Islamic law.

In conclusion, the adoption of smart contracts in Islamic economic diplomacy faces significant but surmountable challenges. Structured and collaborative approaches, such as improving blockchain infrastructure, educating communities to reduce cultural resistance, and harmonizing cross-border regulations with Sharia authorities, are critical steps to overcoming these obstacles. If these challenges are addressed effectively, smart contracts

have the potential to become catalysts for accelerating transparent, efficient, and Sharia-compliant international transactions.

Case Studies and Implementation of Smart Contracts in Islamic Economy and International Diplomacy

The implementation of smart contracts in the Islamic economy has yielded tangible results in various areas, such as trade, investment, and international zakat management. This technology fosters a more efficient, transparent, and Sharia-compliant system. The following case studies provide concrete examples of how smart contracts are applied to support Islamic economic diplomacy on a global scale.

1. International Halal Trade

One of the successful applications of smart contracts is in managing the international halal supply chain. For example, blockchain-based platforms like HalalChain have integrated smart contracts to ensure that every step in the supply chain, from production to distribution, adheres to internationally recognized halal standards. In the context of Islamic economic diplomacy, this allows member states of the Organization of Islamic Cooperation (OIC) to strengthen cooperation in trading halal products. Smart contracts record data on product origin, halal certification processes, and delivery details, thereby increasing trust among nations and reducing the risk of non-halal products entering the market.

2. Sharia-Compliant Financing and Investment

In the investment sector, smart contracts are used to facilitate Sharia-compliant financing, such as sukuk (Islamic bonds). The United Arab Emirates, for example, has begun utilizing blockchain to issue sukuk supported by smart contracts. These contracts ensure that coupon payments to sukuk holders are automatically executed on a predetermined schedule, reducing the risk of delays or errors. Additionally, this mechanism ensures that funds raised through sukuk are allocated exclusively to Sharia-compliant projects, such as infrastructure development or investments in green energy.

3. International Zakat and Waqf Management

The management of international zakat and waqf has also benefited from smart contracts, improving efficiency and transparency. For instance, Malaysia's "Blockchain for Zakat" project enables the automatic distribution of zakat to eligible recipients. Using smart contracts, zakat funds are directly transferred to recipients' accounts once their data is verified via blockchain systems. This approach not only ensures that zakat is managed in compliance with Sharia but also reduces administrative costs and enhances accountability. Globally, this technology facilitates collaboration among Islamic nations to distribute zakat more equitably to Muslim communities in need.

4. Multilateral Trade Cooperation

Smart contracts are also employed in multilateral trade platforms involving Islamic countries. For example, a consortium in the Middle East and Southeast Asia has developed a blockchain-based trade system for exporting and importing strategic goods, such as palm

oil and agricultural products. In this implementation, smart contracts streamline payment and shipment processes. When exporters submit electronic documents verifying the shipment, the smart contract automatically releases payments to the exporter, thereby reducing transaction settlement times and minimizing disputes between nations.

5. International Agreements through Digital Waqf

In Turkey, smart contracts have been utilized in managing digital waqf funds to finance social projects, such as education and healthcare services. These contracts ensure that donor contributions are used solely for pre-agreed purposes, such as constructing schools or providing scholarships. As project stages are completed, the smart contract automatically updates its status on the blockchain, allowing all stakeholders to monitor progress transparently. This implementation demonstrates how waqf, a traditional instrument in the Islamic economy, can be adapted with modern technology to support economic diplomacy and sustainable development.

Smart Contracts as a Catalyst for Economic Relations Among Muslim Countries

The utilization of smart contracts in economic diplomacy presents significant opportunities for Muslim-majority countries to strengthen economic ties, enhance global competitiveness, and expand their influence in the international economic order. This technology supports transparent, efficient, and Sharia-compliant transactions, making it a strategic tool for bolstering economic cooperation both among Islamic nations and with global partners. Additionally, adopting smart contracts fosters a more inclusive and technologically adaptive approach to economic diplomacy.

1. Enhancing Efficiency and Trust in International Trade

One of the primary barriers to international trade is the lack of trust between countries concerning contract validity and enforcement. Smart contracts, operating on blockchain technology, ensure that all terms in trade agreements are automatically executed once specific conditions are met. For instance, in the export of halal products, smart contracts can record and verify the entire process, from halal certification to product delivery. Member states of the Organization of Islamic Cooperation (OIC) can leverage this technology to build trust in intra-OIC trade, which currently remains underutilized relative to its economic potential.

2. Strengthening Global Sharia-Compliant Investments

Muslim-majority countries can focus their economic diplomacy on developing Sharia-compliant investment ecosystems by leveraging smart contracts. Nations such as the United Arab Emirates, Malaysia, and Indonesia can lead blockchain-based sukuk issuance to finance strategic infrastructure projects. This technology enables international investors, including those from non-Muslim countries, to participate in secure, transparent, and ethically aligned investments. Consequently, smart contract-driven economic diplomacy not only strengthens ties among Muslim nations but also opens avenues for collaboration with other countries.

3. Promoting Transparency in International Aid and Philanthropy

Muslim countries often play dual roles as both recipients and donors of international aid, particularly through zakat, waqf, and other humanitarian funds. By utilizing smart contracts, aid distribution can be direct, transparent, and targeted. For instance, international zakat funds could be managed through blockchain platforms, allowing donor countries to monitor fund usage by recipient nations. This innovation not only enhances trust among countries but also boosts the credibility of Muslim nations as innovative actors in global philanthropy.

4. Creating Opportunities for Technology Diplomacy

The development and adoption of smart contracts can be integrated into the technological diplomacy strategies of Muslim-majority countries. Nations excelling in blockchain technology, such as the UAE and Malaysia, can share expertise and infrastructure with other Muslim nations, fostering bilateral and multilateral technological cooperation. Additionally, Muslim countries can advocate for global standards in Sharia-compliant smart contracts, offering solutions not only for Islamic communities but also as ethical and sustainable alternatives for the global economic system.

5. Impact on International Relations

Implementing smart contracts in Islamic economic diplomacy could reshape international relations dynamics. Muslim-majority nations have an opportunity to position themselves as leaders in technological innovation rooted in ethical and sustainable values. This leadership can enhance their bargaining power in global forums such as the G20, WTO, and the UN, while fostering new strategic alliances built on shared visions of technology and Sharia-compliant economics. Furthermore, successful integration of smart contracts could increase global reliance on systems developed by Muslim nations, thus broadening their economic diplomacy influence.

By strategically leveraging smart contracts, Muslim-majority countries can not only strengthen economic relations among themselves but also emerge as leaders in shaping a fairer and more transparent global economic system. Realizing this potential requires close collaboration among governments, financial institutions, Islamic scholars, and technological innovators, supported by consistent regulatory frameworks at both national and international levels.

Conclusion

This research finds that smart contracts are an instrument with great potential to accelerate and enhance the efficiency of Islamic economic diplomacy in the digital era. This technology is capable of overcoming various obstacles in international transactions, such as mistrust between parties, complex bureaucracy, and non-compliance with Sharia principles. The implementation of smart contracts in sectors such as halal trade, sharia investment, and international zakat management has shown tangible results in improving transparency, accountability, and operational efficiency. Additionally, this technology can serve as a catalyst in strengthening economic relations between Muslim countries, fostering greater trust among global partners, and opening opportunities to leverage blockchain technology as a foundation for a more inclusive and modern Islamic economy.

To fully realize the benefits of smart contracts, Muslim-majority countries and international organizations such as the OIC are advised to develop a regulatory framework that supports the adoption of this technology. Strategic steps that can be taken include harmonizing cross-border regulations, training human resources skilled in blockchain technology, and establishing global standards for Sharia-compliant smart contracts. In the future, integrating smart contracts into the global Islamic economic framework has the potential to strengthen the position of Muslim countries as pioneers in ethical and sustainable value-based economic diplomacy. If widely adopted, smart contracts will not only accelerate the transformation of the Islamic economy but also make a significant contribution to creating a more just, transparent, and sustainable global economic system.

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