

Non-Fungible Tokens (NFTs) in Islamic Perspective: Challenges and Way Forward

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ABSTRACT

Non-fungible tokens (NFTs) have recently emerged as a novel application of blockchain technology in digital asset transactions. However, the integration of NFTs into Islamic finance remains limited due to several unresolved Shariah issues. This qualitative study employs content analysis to review past studies on NFTs from a Shariah perspective. The primary focus areas include the compliance of NFT transactions with the pillars of sale (bay'), the classification of NFTs as wealth (mal) in Islamic law, the use of cryptocurrency in NFT transactions, and the copyright protection of NFTs as digital assets. The key challenges identified encompass the lack of clear Shariah parameters governing NFT mechanisms, differences in scholarly opinions, the prevalence of ambiguity and uncertainty in NFT valuation and ownership, the high carbon footprint associated with NFT platforms, and inadequate legal protection for users. To facilitate greater adoption of NFTs in Islamic finance, this paper recommends the formulation of comprehensive Shariah parameters and guidelines, enhancement of transparency in royalty distribution, utilization of energy-efficient platforms, and the establishment of appropriate governance frameworks. Mainstreaming a Shariah-compliant NFT ecosystem has the potential to drive innovation in Islamic fintech and the broader digital economy.

KEYWORDS

Non-fungible token; Islamic finance; Shariah compliance; fintech

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INTRODUCTION

NFTs, or Non-Fungible Tokens, are unique digital assets created and stored on a decentralized digital ledger blockchain. Unlike cryptocurrencies like Bitcoin or Ethereum, which are fungible (meaning one unit is interchangeable with another), each NFT is a one-of-a-kind asset with its own unique identifying code and metadata (Anatoli Colicev. 2023; Frankenfield J. 2022). NFTs represent a modern form of asset that embodies ownership over digital items, such as artwork, collectibles, or even virtual real estate. These NFTs are traded on online marketplaces, often utilizing cryptocurrencies for transactions. They leverage similar blockchain technology that underpins many cryptocurrency networks to establish verifiable digital scarcity and ownership.

There are four main characteristics of NFT technology: (i) uniqueness because there is no other token that is the same for each NFT; (ii) traceability because all records of ownership and transaction movements of each NFT can be viewed transparently on the entire blockchain data; (iii) authentication because each NFT token is stored in a digital ledger and decentralized network, the blockchain, which

allows NFTs to be authenticated and cannot be counterfeited or replicated; (iv) adaptability because NFTs can quickly adapt to digital life in the metaverse world and various NFT applications that allow players to trade NFTs across multiple platform markets (Nur Rizqi, Fadli and Denizar 2022).

The other characteristics of NFTs are non-interchangeability because NFTs cannot be directly exchanged with other artifacts after being minted as an NFT; scarcity because due to their unique nature, each NFT is limited and is the only one that exists in the blockchain, and indirectly this scarcity leads to a higher market value; resaleability because each NFT can be continuously sold and resold on the secondary market; collectability because NFTs are a system for collecting objects in virtual mode, to obtain economic value such as investment or non-economic value (e.g. social status, entertainment and religious reasons) (Chandra 2022).

NFT transactions are regarded as electronic commerce due to the buying and selling mechanisms facilitated through NFT e-commerce platforms. However, what sets them apart from traditional e-commerce is the nature of the assets involved and the use of digital currencies (Xeril Ghaisani & Asep Ramdan 2022). NFTs are unique digital tokens that

represent the ownership and authenticity of an asset or item, verified through cryptographic techniques (Anon 2019). The concept of NFTs has gained significant attention in recent years, particularly in the art and collectibles worlds, as they provide a way for creators and artists to monetize their digital assets and for collectors to own and trade unique digital items. However, the applications of NFTs extend far beyond these initial use cases, with potential implications for various industries, including gaming, finance, and supply chain management.

The inherent uniqueness of NFTs has propelled them into a rapidly expanding sector within the digital economy (Ardanu Bagas 2021), particularly in community economies, encompassing both individuals and corporations. This phenomenon is exemplified by the case of Cardock, who successfully sold the Cryptokhat #8699 NFT for approximately RM1,000 through the OpenSea platform. Remarkably, this NFT was purchased for USD1,796 (approximately RM5,000) in April 2022, netting Cardock a substantial profit of around 500 percent from the sale of the Cryptokhat NFT. Major corporations like Adidas, Nike, and McDonald's have also embraced the NFT trade, leveraging it to generate supplementary income and expand their brand reach. The Malaysian NFT Club (MNC) has emerged as a pioneering organization in Malaysia, inviting the public to explore this novel opportunity to revitalize the nation's digital economy by adopting NFTs (Hilal Azmi, 2022).

LITERATURE REVIEW ON NFTS FROM A SHARIAH PERSPECTIVE

The meteoric rise of NFTs has ushered in a new era for digital assets within the financial technology (FinTech) space, capturing mainstream attention and solidifying their position as a prominent force in the cryptocurrency ecosystem (Bao H. & Roubaud D. 2021; Ante L. 2022; Dowling 2022a). Based on a decentralized financial services system (DeFi), NFT technology can strengthen the existing economic system, including the Islamic financial system (Ardanu Bagas 2021). According to Nafis Alam (2021), the advent of NFTs has catalyzed a paradigm shift in how individuals engage with financial services, revolutionizing the FinTech landscape. Furthermore, the emergence of NFTs as a FinTech product holds promising prospects, as they serve as a bridge to the burgeoning digital economy (Mukhopadhyay M. & Ghosh K. 2021). Toraman Y. and B.B. Gecit (2023) highlight the increasing global attention garnered by blockchain systems, particularly cryptocurrencies, which have propelled NFTs into the forefront of discussions.

However, the increasing popularity of NFTs is not without controversy, and there remains ambiguity in understanding the concept and mechanisms of its operations. This includes ambiguities surrounding asset ownership, the form of assets represented by

NFT tokens, and other aspects. Although some early adopters have ventured into the NFT sector, the overall NFT ecosystem requires further clarification for broader adoption, especially regarding the buying, selling, and ownership processes (Zarifis A. & Castro L.A. 2022). Moreover, this NFT financial technology has garnered attention from Islamic scholars. From an Islamic perspective, there is no obstacle to new technological development. Islam strongly encourages and recognizes the use of human intellect to the maximum extent for the benefit of human life (Azrul Azlan n.d.). The evidence lies in the recognition of financial technology products involved in NFT transactions, such as blockchain and cryptocurrencies, for their use in Islamic financial technology at the global level (Global Islamic Fintech Report 2021; MDEC Islamic Fintech Report 2020). Islam, as a comprehensive way of life, emphasizes Shariah principles in all forms of transformation to comply with the standards set by the Quran and Sunnah. Only now, scholars and Shariah institutions have determined the laws and fatwas related to NFT trading transactions, causing many to feel apprehensive about venturing into this growing technology (Nur Rizqi, Fadli & Denizar, 2022). Studies conducted to identify the laws of NFTs also need to be more consistent and show that there are still Shariah issues in these transactions.

NFT application has received various views and criticisms among scholars regarding its compliance with Islamic law's pillars and conditions of sale and purchase (*al-bay'*). Shofa Robbani & Ifa Khoiria (2022), argues that NFT transactions on the OpenSea market do not conform to the pillars of *al-bay'* due to the failure to meet the conditions regarding the contracting parties, goods/assets, and the price of goods. This non-compliance arises when underage sellers and buyers are involved and when a single individual assumes the roles of both seller and buyer in a transaction involving the same digital asset. Furthermore, the digital assets of NFTs are deemed to violate the conditions of *al-bay'* due to the sale of digital assets belonging to others without the owner's permission (Shofa Robbani & Ifa Khoiria 2022). Regarding the price of NFT assets, it is argued that the use of cryptocurrencies, which are subject to price fluctuations, results in price ambiguity, thereby failing to comply with the theory of *thaman* and the pillars and conditions of the *al-bay'* contract (Shofa Robbani & Ifa Khoiria 2022; Xeril Ghaisani & Asep Ramdan 2022).

On the other hand, some studies assert the validity and permissibility of NFT transactions in Islam (Nur Rizqi, Fadli & Denizar 2022). These studies argue that NFT transactions have met the pillars and conditions of sale and purchase, such as the existence of a seller and buyer as contracting parties, the statement of offer and acceptance, digital NFT assets as traded goods, and the use of cryptocurrency as an agreed-upon exchange rate (*thaman*) between the two parties (Nur

Rizqi, Fadli & Denizar 2022; Gustira Hidayatul 2022; Mumtaza Wafda 2023).

Additionally, NFT transactions are viewed in line with the concept of *murabahah*, as the purpose of these transactions is to obtain profit, aligning with the purpose of *murabahah* sale and purchase. One example is the pillars and conditions of the *murabahah* contract are fulfilled in the OpenSea platform: the seller and buyer acting as *al-aqidan* (contracting parties), NFT as the object of the contract, cryptocurrency as the transaction instrument, and the price history feature that ensures transparency in determining the capital/cost and the amount of profit obtained between the two parties (Gustira Hidayatul 2022; Dowling 2022b).

Nur Rizqi, Fadli, and Denizar Abdurrahman (2021) opined that NFTs comply with the pillars and conditions of sale and purchase since the specific law regarding NFTs is not stated in the Quran and Hadith. Thus, NFT transactions are permissible according to Islamic law. Similarly, a study by Gustira Hidayatul (2022) analyzed NFT transactions on the OpenSea platform based on the pillars and conditions of sale and purchase. The study found that NFT as the object of sale and purchase, cryptocurrency as the exchange value, creator as the seller, and collector as the buyer demonstrate that NFT transactions have fulfilled the pillars of sale and purchase. However, this study did not conclusively determine the validity of NFTs due to other issues such as value ambiguity, security, guarantees, and so on.

In contrast, Shofa Robbani and Ifa Khoiria (2022) found that NFT transactions on OpenSea still need to meet the pillars of sale and purchase. This is due to the involvement of underage sellers and buyers, and the seller also acts as the buyer for the same asset. Additionally, selling digital NFT assets without the original owner's permission violated the pillars of sale and purchase. The debate surrounding the Islamic legal status of NFTs remains ongoing, highlighting the need for further scholarly discourse and clarification on this emerging technological application.

THE POSITION OF NFTS AS ASSETS (*AL-MAL*) IN ISLAM

NFT's status as an asset from an Islamic perspective is still a subject of discussion among Islamic scholars and experts. Islamic law has a comprehensive framework governing property rights and ownership, encompassing tangible and intangible assets. The concept of *al-mal* in Islamic jurisprudence is central to understanding how ownership is perceived within Islam. According to classical Islamic scholars, for something to be considered "Mal," it must fulfill specific criteria, such as being valuable, capable of being appropriated, and lawful in the Shariah context. Scholars have delved into whether digital assets like NFTs can be considered property one can own, given their intangible nature. The discussions often revolve around the concept of *al-mal* in Islam and whether

NFTs fit into the categorization of assets that can be owned, utilized, and transacted according to Shariah.

In Islamic jurisprudence, the concept of *al-mal* extends beyond physical possessions to include rights that have value and can be lawfully owned. This encompasses both "ayn" (tangible assets) and "dayn" (debts or intangible assets), indicating a recognition of various forms of property, including those that are not physically tangible. Property ownership in Islam is subject to the condition that it does not contravene Shariah principles, implying that the property must be acquired, utilized, and disposed of in ways compliant with Islamic law.

D. Chalmers et al. (2022) and Pinto-Gutierrez C. et al. (2022) state that NFTs are blockchain-based cryptographic assets representing proof of ownership for legitimate digital assets or objects only. However, other studies stated that NFTs could represent digital and physical asset ownership (Mochammad Tanzil 2022; Ante L. 2022; Zarifis A. & Castro L.A. 2022). For example, NFTs can prove ownership of digital assets such as digital art, music, and virtual items in computer games, whereas, for physical assets, NFTs can prove ownership of real estate, luxury bags, and certificates (Zarifis A. & Castro L.A. 2022). It needs to be clarified whether NFTs can represent ownership of only digital assets or digital and physical assets.

Faraz Adam (2021) and Soualhi (2023) classify NFT assets into six categories: art, collectibles, in-game items, data and licensing, media, and ticket minting. This categorization differs from studies stating that NFTs can be categorized into six other categories: art, gaming, utilities, metaverse, collectibles, and others (Matthieu Nadini et al., 2021). The difference in the categorization of NFT assets leads to ambiguity in identifying which asset categories can be traded in NFT marketplaces.

According to Ali al-Khafifi, Muhammad Musthafa Salabi, and some scholars of the Shafi'i and Maliki schools of thought, digital NFT assets can be categorized as property in Islam because they contain unique value and benefits for their owners. This view is seen based on the five aspects of *al-mal* in Islam. First, from the aspect of the legality of *al-mal*, NFTs are considered *al-mal al-mutaqawwim* if the asset does not violate the Shariah, and it is regarded as *al-mal ghayr al-mutaqawwim* when it violates the Shariah. Second, from its nature, NFT assets are included as movable (*manqul*) property, which can be transferred to the hands of others. Third, from the utilization aspect, NFT assets are *al-mal al-isti'maliy*, which means property that cannot change when utilized. Fourth, in terms of criteria, NFT assets encompass both *mithliy*. They have similarities with other assets, and *qimiy*, because they may be the same but differ in price and value. Fifth, the final aspect, which is the aspect of ownership, shows that NFT assets are considered personal property because the legitimate ownership of a digital work is recorded in the blockchain, thus including this asset as personal property (Shofa Robbani & Ifa Khoiria 2022).

Despite being digital, NFTs possess exchange value in the market (Florian Idelberger & Péter Mezei 2022; Foteini Valeonti et al. 2021). This fulfills the condition of *mal mutaqawwim*, according to Ibn Qudamah of the Hanbali school. Moreover, their owners can use NFTs for trading, licensing, collateral, etc. This aligns with Imam Shafi'i's view that something is considered wealth if it is beneficial and has value. The transfer of NFT ownership is recorded on the blockchain, cannot be altered, and its authenticity is verified (Ammar Battah 2022). According to the Maliki school, this ensures clarity of ownership status as a condition of wealth. Lastly, NFTs as digital assets do not contradict Islamic texts. They are also not included in the category of prohibited items. This fulfills the basic principle in transactions according to the Hanbali school. However, according to the Hanafi school, NFTs are not categorized as wealth because they are virtual, cannot be stored, and do not exist physically. The transfer of NFT ownership is only digitally recorded, without physical delivery or possession, leading to potential fraud and uncertainty (Shofa Robbani & Ifa Khoiria, 2022).

M. Labib, H. Hendri & Qurroh Ayuniyyah (2023) also categorize digital NFT assets as *al-mal* in Islam due to two factors: *qimiy* property because NFT assets have no counterparts in the market and *isti'maliy* property because NFT assets do not diminish when used. This factor is one of the characteristics that can make NFT a waqf asset. This is supported by Ahmad Raihan (2023), who states that NFT assets are *al-mal* in digital form and need to be maintained. Their copyrights are protected based on the principle of maqasid shariah, which protects wealth because these assets have benefits and economic value.

However, there are views from other scholars who do not accept digital NFT as assets that comply with Islam. According to Tuan Yaser Taufik Syamlan, the Head of the Islamic Micro Finance Diploma Program, a tangible asset in NFT transactions is outside the principles of the Islamic economy. Tuan Kanny Hidayat, the Head of the Shariah Banking Sector of the DSN MUI, also stated that the absence of a tangible good or asset is prohibited according to Islamic jurisprudence (Siti Saroh et al., 2023). This view is in line with the Hanafi school of thought, which does not allow NFT assets to be categorized as *al-mal* due to the non-existent digital work of NFTs, which tends to have a non-ownable value and the ambiguity that can befall sellers and buyers (Shofa Robbani & Ifa Khoiria 2022). NFTs are valuable as they are bought, sold, and traded at significant prices. They can also be appropriated because the ownership of an NFT is exclusive to the buyer and can be transferred. This aspect aligns with the Islamic criteria for something to be considered property.

ISSUE AND CHALLENGES OF USING CRYPTOCURRENCIES IN NFT TRANSACTIONS

NFTs as assets can be traded as long as they are not used as payment instruments like cryptocurrencies (Ahmad Raihan, 2023). This aligns with the MUI fatwa, which only prohibits using cryptocurrencies. According to Shariah, the issue of fluctuating exchange rates in NFTs and cryptocurrencies needs further examination to achieve legal certainty regarding the permissibility of their use in NFT transactions (Mumtaza Wafda, 2023).

The usage of cryptocurrencies in NFT transactions, such as paying gas fees, is also why most previous researchers have stated that this transaction falls under *gharar*, *darar*, and gambling and hence ruled it as haram. Indonesian Ulama Council (MUI) has issued a fatwa that cryptocurrencies are prohibited. According to a study by Xeril Ghaisani and Asep Ramdan (2022), using cryptocurrencies in NFT transactions on the OpenSea platform does not comply with the pillars of Islamic financial transaction. This renders the transaction invalid. This is due to the unstable and fluctuating nature of cryptocurrencies and their use being prohibited by the Indonesian Ulama Council (Xeril Ghaisani & Asep Ramdan 2022; Sundari, Siti Nur Faiza & Lailatul Rahma 2022; Gustira Hidayatul 2022; Shofa Rabbani & Ifa Khoiria 2022).

COPYRIGHT PROTECTION FOR NFTS AS DIGITAL ASSETS

There needs to be more clarity regarding the concept of copyright and ownership of NFT assets. If a buyer purchases an NFT, the buyer does not own the copyright for that NFT after the purchase. This is because the creator will retain the copyright of the NFT, while the buyer only has the right to sell the NFT at any time (Mukhopadhyay M. & Ghosh K. 2021). Nevertheless, some scholars view that an NFT can only have one owner, and when a buyer purchases an NFT, the buyer will gain exclusive ownership of that particular digital asset (Nafis Alam 2021). This perspective is also supported by other studies that report that NFT buyers can obtain ownership of the NFT asset and verify its authenticity and originality through blockchain metadata during the sale transaction (Juliet M. & Christopher K. 2022; Mochammad Tanzil 2022). Thus, this needs to be clarified in understanding the concept of NFTs, whether the copyright of the NFT asset remains with the creator or if ownership can be transferred to the buyer.

Furthermore, the ambiguity of the NFT concept can be seen when the current practices in NFT transactions do not align with the established theory of NFTs. In theory, NFTs are defined as having unique characteristics because no two tokens are the same for each NFT as these tokens are recorded on the

blockchain network (Nur Rizqi, Fadli & Denizar 2022; Chandra 2022; Chen & Omote 2022). NFTs also have an authenticated characteristic because they cannot be counterfeited, altered, or replicated since these tokens are stored in the distributed and decentralized blockchain technology, allowing them to be verified and not counterfeited (Logan Kugler 2021; Chandra 2022; Mohammad Madine et al. 2023). However, these NFTs are plagiarized and counterfeited in practice, raising significant concerns for artists and customers (Prihatno A.T. et al., 2023). More than 80 percent of the NFTs minted on one of the largest NFT marketplaces, OpenSea, are fake and plagiarized (Igor Bonifacic, 2022). Therefore, the contradiction between the theory and current practice of NFTs has led to ambiguity in understanding the actual concept of NFTs.

According to Ahmad Raihan (2023), the copyright of digital works represented by NFTs needs to be protected following the principles of *maqasid syariah*, which is the protection of wealth. This is because NFTs are digital assets that have economic value and benefits. This copyright protection is based on creative works' benefits and monetary value. Without this protection, it would contradict the objectives of Shariah (Ahmad Raihan, 2023). Copyright must be protected to prevent misuse and plagiarism of digital NFT works. This is to ensure that the economic rights of the creator are preserved through royalties from NFT sales (Hisny Fajrussalam et al., 2022). In addition, copyright protection should be prioritized in NFT transactions to protect the interests of digital work creators and as an incentive for creating better works (Dong YP & Wang CH. 2023). Protecting copyright and authorship rights is crucial in the NFT ecosystem to ensure that digital work creators' benefits and economic interests are guaranteed within the Shariah framework. This will foster a fair and sustainable environment for creativity and innovation in digital art and NFT while upholding Islamic principles and values.

GHARAR (UNCERTAINTY) AND SPECULATION

The primary concern regarding NFTs is whether the speculative aspect of NFT trading constitutes *gharar*, potentially making such transactions non-compliant with Shariah principles. Some scholars argue that as long as the asset represented by the NFT is clear and its ownership rights are well-defined, the transaction may be permissible, reducing concerns of *gharar*. Islamic finance is deeply intertwined with Islam's ethical and moral teachings, which are designed to ensure that all financial transactions promote social justice, economic equality, and the welfare of the community. This ethical dimension is a distinguishing feature of Islamic finance, setting it apart from conventional financial systems. These ethical and moral considerations regarding NFTs are paramount, given the diverse nature of the assets they represent.

The existence of *gharar*, *darar* (harm) elements, and gambling in NFT transactions is due to several main factors. First, NFT assets do not have a clear value because almost all NFT assets do not have a clear underlying asset; instead, their value is determined based on the demand and supply of the product (Gustira Hidayatul, 2022). Second, NFT assets are categorized as *gharar* due to a lack of security guarantees, leading to frequent cases of fraud, counterfeiting, and art theft in the NFT market for personal gain (Gustira Hidayatul 2022; Shofa Rabbani & Ifa Khoiria 2022).

Furthermore, the absence of the right of *khiyar* is also a Shariah issue that creates a conflict in NFT transactions. This issue arises when a buyer wants to purchase a digital asset and has paid the gas fee by pressing 'confirm,' in which case the sale cannot be canceled (Shofa Rabbani & Ifa Khoiria 2022). This shows that both the seller and buyer do not have the right of *khiyar*, whereas in Islam, transacting parties are given the option and right to continue or cancel the contract (Azrul Azlan 2023; Shofa Rabbani & Ifa Khoiria 2022). Therefore, the elements of *gharar*, *darar*, gambling, and the absence of the right of *khiyar* in NFT transactions must be addressed to ensure Shariah compliance.

ETHICAL AND MORAL FOUNDATIONS IN ISLAMIC FINANCE

Islamic finance's ethical and moral framework is derived from the Quran and Sunnah, and Islamic scholars have elaborated further over centuries. This framework prohibits transactions involving prohibited elements such as usury, *gharar*, gambling, and investment in businesses that deal with alcohol, pork, gambling, and other prohibited activities. The ethical considerations also extend to ensuring fairness, transparency, and the welfare of all parties involved in a transaction.

Transactions involving NFTs do not fulfill the principle of balance (*tawazun*). According to Fathurrahman Djamil, the principle of *tawazun* is one of the four principles of muamalah, which means that muamalah must be carried out while preserving the value of *tawazun*. The implementation of NFTs has been found to fail to meet this principle of *tawazun* due to its high carbon footprint, making it environmentally unfriendly. This carbon emission originates from the high resource requirements of NFTs to operate the blockchain and cryptocurrencies used as payment (Mumtaza Wafda 2023; J. Truby et al. 2022).

MOVING FORWARD

For Muslims engaging with NFTs, a nuanced understanding of these ethical and moral considerations is crucial. The dynamic nature of NFTs means that each asset needs to be evaluated on its own merits, considering its content, value, and impact on

society. As the digital asset space evolves, ongoing scholarly discourse will be essential in providing updated guidance that reflects new developments and ensures that Muslims can participate in this innovative space in a manner consistent with their faith.

Due to the persisting Shariah issues in NFTs, Ardanu Bagas (2021) states that clear guidelines on Shariah compliance for NFTs need to be established to develop a halal NFT market, as NFTs have the potential to become one of the technologies in Islamic finance. This is in line with the report issued by the government agency Malaysia Digital Economy Corporation (MDEC), which suggests developing guidelines for Islamic financial technology through the establishment of parameters for Islamic financial technology services, as well as clarifying the roles of stakeholders and market practitioners (MDEC Islamic Fintech Report 2020). Establishing these Shariah parameters for NFTs will indirectly develop the Islamic digital economy, as the positive impact of NFT transactions can initially boost the digital economy. Therefore, this study plays a role in establishing Shariah parameters for NFT transactions to strengthen Islamic financial technology and the Islamic digital economy. While NFTs offer a novel and exciting avenue for creativity and investment, their permissibility from an Islamic perspective hinges on adherence to Islamic finance's ethical and moral principles. As such, Muslims are encouraged to exercise due diligence and seek guidance from knowledgeable scholars in Islamic finance and digital assets before engaging with NFTs.

CONCLUSION

The rising popularity and adoption of non-fungible tokens (NFTs) as digital assets represent a paradigm shift in asset ownership and transactions. While the underlying blockchain technology holds immense potential for Islamic finance and the digital economy, the current NFT ecosystem poses several Shariah compliance challenges that need to be addressed. Key concerns include the prevalence of speculative elements, ambiguity in asset valuation, use of cryptocurrencies prohibited under a fatwa, elements of *gharar*, *darar*, gambling, lack of *khimar* in transactions, and ambiguity around copyright ownership of the underlying digital work. To facilitate the mainstream adoption of NFTs within the boundaries of Islamic principles, shariah guidelines must be developed through collaborative efforts between Shariah scholars, technology experts, policymakers, and industry stakeholders. Robust governance mechanisms encompassing standardized contract templates, transparent royalty distribution models, and dispute resolution protocols are imperative. Moreover, the growing environmental concerns surrounding the high carbon footprint of NFT platforms necessitate a transition towards energy-efficient consensus mechanisms and renewable energy sources.

By addressing these challenges systematically, the Islamic finance industry can pave the way for a Shariah-compliant NFT ecosystem that upholds the core principles of Islamic finance while fostering innovation, financial inclusion, and ethical investment opportunities in the burgeoning digital economy. Collaborative efforts from all stakeholders are crucial to bring about the necessary frameworks, governance structures, and technological innovations for NFTs to thrive within the moral and ethical tenets enshrined in Shariah law. This study has significant implications for developing Islamic financial technology and the broader Islamic digital economy. Establishing clear Shariah parameters for NFT transactions can strengthen the Islamic fintech sector by providing much-needed guidance and regulatory clarity. This, in turn, can boost innovation and attract greater participation from industry players, investors, and consumers.

REFERENCES

- Ahmad Raihan. 2023. Perlindungan hak cipta atas Non-Fungible Token (NFT) sebagai aset digital di Indonesia. Tesis Sarjana, Program Studi Hukum Ekonomi Syariah, Universitas Islam Negeri Maulana Malik Ibrahim Malang.
- Aji Teguh Prihatno, Naufal Suryanto, Sangbong Oh, Thi-Thu-Huong Le & Howon Kim. 2023. NFT image plagiarism check using EfficientNet-Based Deep Neural Network with Triplet Semi-Hard Loss. *Applied Sciences* 13(3072): 1-20.
- Alex Zarifis & Luis A. Castro. 2022. The NFT purchasing process and the challenges to trust at each stage. *Sustainability* 14(16482): 1-13.
- Ammar Battah, Mohammad Madine, Ibrar Yaqoob, Khaled Salah, Haya R. Hasan & Raja Jayaraman. 2022. Blockchain and NFTs for trusted ownership, trading, and access to AI models. *IEEE Access* 10: 112230-112249.
- Anatoli Colicev. 2023. How can Non-Fungible Tokens bring value to brands? *International Journal of Research in Marketing* 40: 30-37.
- Anon. 2019. *Non-Fungible Tokens: 101 Guide*. Slaid.
- Ante, L. 2022. The Non-Fungible Token (NFT) market and its relationship with bitcoin and ethereum. *FinTech* 1: 216-224.
- Ardanu Bagas Wicaksono. 2021. Bagaimana NFT dan Smart Contract dapat mempengaruhi kewangan Syariah. *Alami Institute*, 27 Disember. [https:// alami.institute/learn/nft-smart-contract-syariah](https://alami.institute/learn/nft-smart-contract-syariah) [20 Julai 2023].
- Azrul Azlan Iskandar Mirza. 2023. *Isu-isu Syariah: Smart Contract, DeFI, Metaverse & NFT*. Slaid. Muzakarah Cendekiawan Syariah Nusantara ke-17.
- Chandra, Y. 2022. Non-Fungible Token-enabled entrepreneurship: a conceptual framework. *Journal of Business Venturing Insights* 18 (e00323): 1-9.

- Chen, Z & Omote, K. 2022. Toward achieving anonymous NFT trading. *IEEE Access* 10: 130166-130176.
- Christian Pinto-Gutiérrez, Sandra Gaitán, Diego Jaramillo & Simón Velasquez. 2022. The NFT hype: what draws attention to Non-Fungible Tokens? *Mathematics* 10(335): 1-13.
- Dinar Standard. 2021. *Global Islamic Fintech Report*: 1-56.
- Dominic Chalmers, Christian Fisch, Russell Matthews, William Quinn & Jan Recker. 2022. Beyond the bubble: Will NFTs and digital proof of ownership empower creative industry entrepreneurs? *Journal of Business Venturing Insights* 17 (e00309): 1-8.
- Dong, YP & Wang, CH. 2023. Copyright protection on NFT digital works in the Metaverse. *Security and Safety* 2: 2023013, pp. 1-14. <https://doi.org/10.1051/sands/>
- Dowling, M. 2022a. Fertile LAND: Pricing Non-Fungible Tokens. *Finance Research Letters* 44 (102096): 1-5.
- Dowling, M. 2022b. Is Non-Fungible Token pricing driven by cryptocurrencies? *Finance Research Letters* 44 (102097): 1-6.
- Faraz Adam. 2021. NFTs: syariah compliant? *Amanah Advisors*, 4 Mac. <https://amanahadvisors.com/nfts-shariah-compliant/> [5 Julai 2023].
- Florian Idelberger & Péter Mezei. 2022. Non-fungible Tokens. *Internet Policy Review* 11(2): 1-9.
- Foteini Valeonti, Antonis Bikakis, Melissa Terras, Chris Speed, Andrew Hudson-Smith & Konstantinos Chalkias. 2021. Crypto collectibles, museum funding and OpenGLAM: challenges, opportunities and the potential of Non-Fungible Tokens (NFTs). *Applied Sciences* 11(9931): 1-19.
- Frankenfield, J. 2022. October 27. Non-Fungible Token (NFT). *Investopedia*, 27 October. <https://www.investopedia.com/non-fungible-tokens-nft-5115211>.
- Gustira Hidayatul Iman. 2022. Transaksi jual beli Non-Fungible Token (NFT) perspektif hukum ekonomi syariah. Tesis Sarjana, Program Studi Hukum Ekonomi Syariah, Universitas Islam Negeri Mataram.
- Hilal Azmi. 2022. Meneroka pasaran AS\$1 trilion dalam dunia baharu digital. *Astro Awani*, 15 Mei. <https://www.astroawani.com/berita-malaysia/meneroka-pasaran-1-trilion-dalam-dunia-baharu-digital-361450> [20 Julai 2023].
- Hisny Fajrussalam et al. 2022. Pandangan Islam terhadap NFT di era digital. *As-Sabiqun: Jurnal Pendidikan Islam Anak Usia Dini* 4(1): 151-162.
- Hong Bao & David Roubaud. 2021. Recent development in Fintech: Non-Fungible Token. *FinTech* 1: 44-46.
- Igor Bonifacic. 2022. Over 80 percent of NFTs minted for free on OpenSea are fake, plagiarized, or spam. *Engadget*, 29 Jan. https://www.engadget.com/opensea-free-minting-tool-220008042.html?_fsig=v8QHd2_W_XYBhoFZFEoIHA--%7EA [28 Julai 2023].
- Jon Truby, Rafael Dean Brown, Andrew Dahdal & Imad Ibrahim. 2022. Blockchain, climate damage, and death: Policy interventions to reduce the carbon emissions, mortality, and net-zero implications of Non-Fungible Tokens and Bitcoin. *Energy Research & Social Science* 88 (102499): 1-14.
- Juliet M. Moringiello & Christopher K. Odet. 2022. The property law of tokens. *Florida Law Review* 74: 608-671.
- Logan Kugler. 2021. Non-Fungible Tokens and the future of art. *Communications of The ACM* 64(9): 19-20.
- M. Labib Fahmi Arif, H. Hendri Tanjung & Hj. Qurroh Ayuniyyah. 2023. Wakaf aset digital: Non-Fungible Token (NFT). *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah* 5(4): 1766-1787.
- Matthieu Nadini, Laura Alessandretti, Flavio Di Giacinto, Mauro Martino, Luca Maria Aiello & Andrea Baronchelli. 2021. Mapping the NFT revolution: market trends, trade networks and visual features. *Scientific Reports* 11(20902).
- Mayukh Mukhopadhyay & Kaushik Ghosh. 2021. Market microstructure of Non-Fungible Tokens. *Five Shades of Emerging Business Cases* 3: 26-38.
- Mochammad Tanzil Multazam. 2022. Exploring the legal and policy implications of Non-Fungible Tokens. *Jurnal Politik dan Pemerintahan Daerah* 4(2): 293-303.
- Mohammad Madine, Khaled Salah, Raja Jayaraman & Jamal Zemerly. 2023. NFTs for open-source and commercial software licensing and royalties. *IEEE Access* 11: 8734-8746.
- Mumtaza Wafda Imala. 2023. Transaksi jual beli Non-Fungible Token (NFT) perspektif fatwa DSN MUI nomor 110 tahun 2017 dan akad jual beli. Tesis Sarjana, Program Studi Hukum Ekonomi Syariah (Muamalah), Universitas Islam Negeri (UIN) Raden Mas Said Surakarta.
- Nafis Alam. 2021. Fintech and the future of finance-rise of NFTs and BNPL. *Malaysia Digital Economy Corporation (MDEC)*, 28 September. <https://blog.mdec.my/?p=1263> [6 Julai 2023].
- Nur Rizqi Febriandika, Fadli & Denizar Abdurrahman Mi'raj. 2022. How are NFT (Non-Fungible Token) transactions reviewed according to Islamic law? *Borobudur Law Review* 4(1): 1-12.
- Perbadanan Ekonomi Digital Malaysia (MDEC). 2020. *MDEC Islamic Fintech Report*: 1-19.
- Shofa Robbani & Ifa Khoiria Ningrum. 2022. Non-Fungible Token sebagai aset digital dalam pandangan fiqh muamalah. *At-Tuhfah: Jurnal Studi Keislaman* 11(2): 1-23.

- Siti Saroh, Listian Indriyani Achmad, Muhammad Hamdan Ainulyaqin & Sarwo Edy. 2023. Analisis transaksi digital Non-Fungible Token (NFT) sebagai instrumen investasi menurut perspektif ekonomi Islam. *Jurnal Ilmiah Ekonomi Islam* 9(01): 378-386.
- Soualhi, Y. 2023. Shariah Issues - Smart Contract, DeFI & NFT. Slaid. *Muzakarah Cendekiawan Syariah Nusantara ke-17*. <https://muzakarah.inceif.edu.my/kertas-kerja/>
- Sundari, Siti Nur Faiza & Lailatul Rahma. 2022. Business analysis of selling and buying Non-Fungible Tokens (NFT) at marketplace OpenSea according to the perspective of Islamic law. *El-Qist: Journal Economics and Business (JIEB)* 12: 1-16.
- Xeril Ghaisani Preshila & Asep Ramdan Hidayat. 2022. Analisis fikih muamalah pada praktik transaksi Non-Fungible Token (NFT) di OpenSea. *Jurnal Riset Perbankan Syariah (JRPS)* 1(2): 77-84.
- Yavuz Toraman & Barış Batuhan Gecit. 2023. User acceptance of Metaverse: an analysis for e-commerce in the framework of Technology Acceptance Model (TAM). *Sosyoekonomi* 31(55): 85-104.