

Legal challenges in the commercialisation of NFTs: a comparative analysis of Europe and Brazil

ABSTRACT

This study examines the legal challenges associated with the commercialization of non-fungible tokens (NFTs) in Europe and Brazil through the lens of Science, Technology, and Society (STS) studies. By integrating STS perspectives, the paper provides a comprehensive analysis of how technological advancements in blockchain and NFTs interact with societal norms and legal frameworks. Key legal challenges identified include intellectual property rights, consumer protection, taxation, and anti-money laundering (AML) regulations within the European and Brazilian contexts. The study illuminates the dynamic interplay between technology, society, and law, offering nuanced perspectives on how legal systems adapt to emerging technologies. The findings contribute to academic discourse by highlighting the necessity for adaptive legal frameworks in the face of technological innovation and by providing a basis for future research in the field.

KEYWORDS: Cryptoassets. Non-fungible tokens. Blockchain. NFT legal challenges; Science, Technology, and Society; STS.

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INTRODUCTION

The rapid emergence of Non-Fungible Tokens (NFTs) has taken the digital world by storm, introducing new opportunities and challenges for the legal community. NFTs are unique digital assets, often associated with a specific digital or physical object, that are stored on a blockchain, thus providing a verifiable record of ownership and provenance. They have become an increasingly popular method of buying, selling, and trading digital art, collectibles, virtual real estate, and other unique digital assets. With a global market value reaching billions of dollars, NFTs have become an integral part of the digital economy and have significantly impacted creative industries, altering the way artists and creators monetize their work.

From a Science, Technology, and Society (STS) perspective, the ascent of NFTs exemplifies the intricate interplay between technological innovation, societal adoption, and regulatory evolution. STS studies emphasize that technological developments are embedded within and influenced by social, cultural, economic, and legal contexts. Technology is not developed in isolation but co-constructed with society, where social factors shape technological trajectories, and technology, in turn, influences social structures. This framework allows us to examine how legal systems adapt to the challenges posed by NFTs, focusing on both the European and Brazilian legal frameworks.

This paper explores the legal challenges in the commercialization of NFTs in Europe and Brazil, analyzing how each jurisdiction's legal system interacts with technological innovations within their distinct social contexts. By conducting a comparative analysis, supported by analytical tables and recent scholarly works, the study contributes to academic discourse on the co-evolution of technology and law. The research aims to provide insights valuable for policymakers, legal practitioners, and stakeholders in the digital economy, emphasizing the importance of adaptive legal frameworks in the face of rapid technological change.

THE EUROPEAN LEGAL FRAMEWORK

The legal framework surrounding NFTs in the European Union is currently fragmented and subject to various directives and regulations. Key EU legislation that may be relevant to NFTs includes the following: Directive 2001/29/EC on the harmonisation of certain aspects of copyright and related rights in the information society (InfoSoc Directive) (European Parliament and Council, 2001); Directive 2004/48/EC on the enforcement of intellectual property rights (IPR Enforcement Directive) (European Parliament and Council, 2004); Regulation (EU) No 1215/2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (Brussels I Recast) (European Parliament and Council, 2012); Directive 2011/83/EU on consumer rights (Consumer Rights Directive) (European Parliament and Council, 2011); Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation, GDPR) (European

Parliament and Council, 2016); Directive (EU) 2018/843 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing (5th Anti-Money Laundering Directive, 5AMLD) (European Parliament and Council, 2018).

The Court of Justice of the European Union (CJEU) plays a crucial role in interpreting EU legislation and ensuring its consistent application across all member states. The CJEU's jurisprudence will be critical in clarifying the legal status and treatment of NFTs under EU law and will guide national courts in their decision-making processes.

KEY LEGAL CHALLENGES RELATED TO NFTS IN AN STS CONTEXT – EUROPEAN PERSPECTIVE

Intellectual Property Rights

a. Copyright Infringement

The commercialisation of NFTs raises questions regarding the extent to which copyright law applies to digital assets (Angelopoulos & Smet, 2021). Although NFTs do not inherently confer copyright to the holder, they may be linked to copyrighted works, such as digital art or music. Consequently, issues may arise when creators or intermediaries tokenize copyrighted works without proper authorisation, potentially leading to copyright infringement (Peguera, 2021).

Table 1: Intellectual Property Challenges in the EU NFT Market

Challenge	Description	Relevant Legislation	Recent Academic Works
Copyright Infringement	Unauthorized tokenization of copyrighted works without consent.	InfoSoc Directive; IPR Enforcement Directive	Peguera (2021); Drexler (2022)
Trademark Infringement	Use of protected trademarks within NFTs without permission, causing consumer confusion.	Trademark Directive (EU) 2015/2436	Savelyev (2021); Lehman (2022)
Moral Rights Issues	NFTs may alter or fragment a work, impacting the author's moral rights to integrity and attribution.	Berne Convention (Art. 6bis); National Laws	Geiger and Frosio (2020)
Enforcement Difficulties	Decentralized nature of blockchain complicates enforcement of IP rights across borders.	Brussels I Recast Regulation	Van den Berg and Van der Hof (2021)

These challenges reflect the co-construction of technology and society, where legal frameworks must evolve in response to technological innovations that disrupt traditional concepts of ownership and reproduction (Jasanoff, 2016). The law must balance protecting creators' rights with fostering innovation and adapting to new modes of content distribution.

Consumer Protection

The NFT market's lack of regulation creates opportunities for misrepresentation and fraud. Consumers may purchase NFTs that do not represent the promised asset or may fall victim to scams, such as rug pulls, where creators abandon projects after raising funds (European Union Blockchain Observatory and Forum, 2020).

Table 2: Consumer Protection Issues in EU NFT Transactions

Issue	Description	Relevant Legislation	Recent Academic Works
Misrepresentation and Fraud	Sellers misrepresent the nature or authenticity of NFTs.	Consumer Rights Directive	Fenu et al. (2021); Hacker (2022)
Lack of Transparency	Insufficient information about the NFT's underlying asset or the terms of sale.	Unfair Commercial Practices Directive	Ranchordás (2021)
Dispute Resolution Challenges	Difficulty in resolving disputes due to the decentralized and cross-border nature of transactions.	ADR Directive; ODR Regulation	Cortés and Lodder (2021)
Data Protection Concerns	Handling of personal data in NFT transactions may conflict with GDPR requirements.	GDPR	Finck (2019); Schrepel (2021)

These issues highlight the need for regulatory frameworks to adapt to protect consumers in technologically advanced markets. Societal trust in technology adoption necessitates stronger consumer protections and greater transparency (Winner, 1986).

Taxation and Anti-Money Laundering Regulations

Tax authorities face challenges in classifying and taxing NFT transactions. The ambiguity regarding whether NFTs are goods, services, or financial instruments affects the application of Value Added Tax (VAT) and income tax (European Commission, 2020). Additionally, the potential for anonymity in NFT transactions raises anti-money laundering (AML) concerns.

Table 3: Taxation and AML Challenges in the EU NFT Market

Challenge	Description	Relevant Legislation	Recent Academic Works
VAT Classification	Uncertainty whether NFT sales are subject to VAT and at what rate.	VAT Directive	Turina (2021); Van der Enden (2022)
Income and Capital Gains Tax	Difficulty in assessing taxable income from NFT transactions due to valuation complexities.	National Tax Laws	Hemels (2021); Gupta (2022)
AML Compliance	NFTs may facilitate money laundering due to high-value transactions and anonymity.	5AMLD; 6AMLD	Dirkis and Payne (2021); Foley (2022)

These challenges underscore the need for regulatory bodies to evolve and address the economic implications of technological innovations. Legal frameworks must balance facilitating innovation with preventing illicit activities and ensuring economic stability (Jasanoff, 2016).

KEY LEGAL CHALLENGES IN AN STS CONTEXT – Brazilian Perspective

The commercialization of NFTs in Brazil presents several key legal challenges, particularly in the areas of intellectual property rights, consumer protection, and taxation and anti-money laundering regulations. These challenges are examined below through the lens of Science, Technology, and Society (STS) studies, which emphasize the co-evolution of technology and legal systems within societal contexts.

Intellectual Property Rights

Unauthorized use of copyrighted material in NFTs raises significant legal issues under Brazil's Copyright Law (Law No. 9,610/1998). The challenge lies in applying traditional copyright concepts to NFTs, which differ fundamentally from physical or traditional digital reproductions.

Table 4: Intellectual Property Challenges in the Brazilian NFT Market

Challenge	Description	Relevant Legislation	Recent Academic Works
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Copyright Infringement	NFTs minted without the consent of the rights holder, violating reproduction and distribution rights.	Law No. 9,610/1998 (Copyright Law)	Santos et al. (2021); Gama (2022)
Moral Rights Issues	Potential violation of the author's moral rights due to unauthorized alterations.	Law No. 9,610/1998	Varella and Varella (2021)
Enforcement Difficulties	Challenges in enforcing IP rights against anonymous or foreign NFT creators.	Civil Procedure Code	Pessoa and Pinheiro (2021)

These challenges illustrate the need for legal systems to evolve alongside technological advancements, balancing protection of IP rights with innovation (Jasanoff, 2016).

Consumer Protection

Consumers may be misled about the authenticity, ownership, or value of NFTs, and there is a lack of clear information regarding terms and conditions.

Table 5: Consumer Protection Issues in Brazilian NFT Transactions

Issue	Description	Relevant Legislation	Recent Academic Works
Misrepresentation and Fraud	Consumers misled about the authenticity or value of NFTs.	Law No. 8,078/1990 (CDC)	Carvalho (2021); Souza (2022)
Information Asymmetry	Lack of clear information regarding NFT transactions.	Law No. 8,078/1990	Almeida and Vaz (2021)
Dispute Resolution Challenges	Difficulties in resolving disputes due to jurisdictional issues and decentralization.	Law No. 13,105/2015 (CPC)	Pessoa and Pinheiro (2021)

These issues reflect the need for consumer protection laws to evolve in response to technological advancements (Winner, 1986).

Taxation and AML Regulations

The taxation of NFTs in Brazil is uncertain due to the lack of specific guidance, and there are concerns about AML compliance.

Table 6: Taxation and AML Challenges in the Brazilian NFT Market

Challenge	Description	Relevant Legislation	Recent Academic Works

Tax Classification	Ambiguity in classifying NFTs for tax purposes, leading to uncertainty in tax obligations.	National Tax Code	Gama (2022); Almeida (2021)
AML Compliance	NFTs may be used for money laundering due to high value and anonymity of transactions.	Law No. 9,613/1998 (AML Law)	Silva and Barbosa (2021)
Lack of Regulatory Guidance	Absence of specific regulations hampers enforcement and compliance efforts.	N/A	Varella and Varella (2021)

These challenges underscore the need for regulatory evolution to address economic and security implications of technological innovations (Jasanoff, 2016).

COMPARATIVE ANALYSIS: EUROPE AND BRAZIL

Similarities and Differences in Legal Frameworks

Both Europe and Brazil confront common legal challenges in regulating NFTs, including intellectual property rights infringement, consumer protection issues, and taxation uncertainties. However, their approaches diverge due to differences in legal traditions, regulatory structures, and societal contexts.

Table 7: Comparative Overview of Legal Frameworks

Aspect	European Union	Brazil
Legal System	Supranational directives and regulations; centralized interpretation by CJEU.	National civil law system; legislation enacted by Congress; judiciary interpretation.
Adaptability	Harmonization promotes consistency but may hinder rapid adaptation due to complex processes.	Potential for rapid adaptation but lacks specific NFT laws, leading to uncertainty.
Regulatory Focus	Emphasis on consumer protection, data privacy (GDPR), and AML compliance.	Focus on general consumer protection and AML laws; emerging interest

		in digital assets regulation.
Enforcement Mechanisms	Established mechanisms but challenged by blockchain's decentralized nature.	Relies on national agencies and courts; faces jurisdiction and enforcement challenges.

These differences have implications for legal certainty, market development, adaptability, innovation, and societal influences.

Implications of Differences

The differences between the European Union and Brazil in their legal approaches to NFTs have significant implications for legal certainty, market development, adaptability, innovation, and societal outcomes. Understanding these implications is crucial for stakeholders, including policymakers, legal practitioners, market participants, and consumers.

In the European Union, the harmonized legal framework, despite its complexities, provides a degree of legal certainty that fosters market confidence. The existence of directives and regulations that, although not specifically designed for NFTs, can be interpreted to cover aspects of NFT transactions, gives participants a foundation upon which to operate. This legal certainty is bolstered by the role of the Court of Justice of the European Union in ensuring consistent interpretation across member states (Craig & de Búrca, 2020). In contrast, Brazil's lack of specific regulations leads to legal ambiguities that can deter investment and hinder market development. Uncertainty regarding the legal status of NFTs, the rights they convey, and the obligations of parties involved can make businesses and consumers hesitant to engage in NFT transactions. This can stifle the growth of the NFT market in Brazil and limit opportunities for economic advancement (Pessoa & Pinheiro, 2021).

The EU's approach, while providing legal certainty, may sometimes be slow to adapt due to the need for consensus among diverse member states. This can result in regulatory lag, where laws do not keep pace with technological innovation. However, initiatives like the proposed Markets in Crypto-assets Regulation demonstrate a willingness to address emerging challenges and support innovation within a regulated framework (European Commission, 2020). Brazil's centralized legislative system offers potential for rapid action once priorities are set. This flexibility could enable Brazil to adopt innovative regulatory approaches and leapfrog more cumbersome systems. However, the current absence of specific regulations can either hinder innovation due to uncertainty or encourage an environment with minimal oversight, which can pose risks to participants and the broader economy (Almeida & Vaz, 2021).

The European Union places a strong emphasis on consumer protection, data privacy, and the enforcement of intellectual property rights. This focus reflects societal values and contributes to building trust in digital markets. Consumers in the EU benefit from robust protections that can mitigate risks associated with NFT transactions, such as fraud or misrepresentation (Ranchordás, 2021). In Brazil, while the Consumer Defense Code provides a foundation for consumer protection, it may not fully address the specific risks associated with NFTs. The lack of tailored regulations can leave consumers vulnerable, potentially undermining trust in the market. This can have broader societal implications, as diminished trust can slow the adoption of new technologies and limit the benefits they offer (Carvalho, 2021).

Enforcement of laws related to NFTs presents challenges in both jurisdictions due to the decentralized and cross-border nature of blockchain technology. In the EU, mechanisms for cross-border enforcement exist, but the anonymity and global reach of blockchain can limit their effectiveness. The EU's efforts to harmonize laws and collaborate internationally can mitigate some of these challenges (Van den Berg & Van der Hof, 2021). Brazil faces similar enforcement challenges but may have additional difficulties due to resource constraints and less developed mechanisms for international cooperation. The ability to assert jurisdiction and enforce judgments against foreign or anonymous parties is limited, potentially allowing infringers to operate with impunity (Pessoa & Pinheiro, 2021).

The differences between the EU and Brazil in their legal approaches also have implications for economic competitiveness and global participation. The EU's regulatory environment, while sometimes criticized for being stringent, can enhance economic competitiveness by providing a stable and predictable market that attracts investment. Compliance with international standards and participation in global regulatory dialogues position the EU as a leader in setting norms for emerging technologies (European Commission, 2020). Brazil's current legal ambiguities may hinder its ability to fully participate in the global digital economy. Uncertainties can deter foreign investment and limit opportunities for Brazilian businesses and creators to engage in international markets. Addressing these legal gaps is essential for Brazil to enhance its economic competitiveness and capitalize on the potential of NFTs (Gama, 2022).

Cultural attitudes towards regulation influence how laws are crafted and implemented. In the EU, a precautionary approach often guides regulatory decisions, emphasizing the protection of individual rights and societal interests. This can lead to comprehensive regulations that, while protective, may be viewed as burdensome by some industry participants (Ranchordás, 2021). In Brazil, there may be a stronger emphasis on promoting innovation and economic development, sometimes prioritizing growth opportunities over stringent regulation. This approach can foster a dynamic environment for technological advancement but may also expose participants to greater risks if not balanced with adequate protections (Almeida & Vaz, 2021).

The differences between the EU and Brazil highlight the importance of international cooperation and the potential benefits of legal harmonization. As

NFTs operate in a global marketplace, divergent legal approaches can create barriers to cross-border transactions and complicate enforcement efforts. Collaborative efforts, such as participating in international organizations like the World Intellectual Property Organization and the Financial Action Task Force, can facilitate the development of common standards and best practices. This cooperation can help bridge gaps between jurisdictions, enhance legal certainty, and support the growth of the global NFT market (Silva & Barbosa, 2021).

Legal practitioners in both jurisdictions must navigate complex and evolving landscapes. In the EU, staying abreast of regulatory developments and Court of Justice interpretations is essential. In Brazil, practitioners must interpret existing laws creatively and advocate for reforms that address clients' needs. For stakeholders such as businesses, creators, and consumers, the legal environment affects strategic decisions, risk management, and opportunities for growth. Understanding the implications of legal differences is critical for making informed decisions and engaging effectively in the NFT market.

In conclusion, the differences between the EU and Brazil in their legal approaches to NFTs have profound implications for various aspects of the market and society. Legal certainty, adaptability, consumer protection, enforcement capabilities, economic competitiveness, and cultural influences all play significant roles. Recognizing and addressing these implications is essential for both jurisdictions to harness the benefits of NFTs while managing associated risks.

CONTRIBUTION TO KNOWLEDGE

This comparative analysis significantly enhances the understanding of how different legal systems respond to technological innovations such as non-fungible tokens (NFTs), emphasizing the critical importance of considering societal contexts in legal adaptations. By examining the legal frameworks of Europe and Brazil, the study sheds light on the complexities and nuances that arise when traditional legal systems encounter disruptive technologies. The analysis not only highlights the current legal challenges but also provides insights into how these jurisdictions might evolve to accommodate emerging technologies while balancing the interests of various stakeholders.

Table 8: Comparative Analysis of Europe and Brazil Regarding NFTs

Aspect	Europe	Brazil
Legal Traditions and Structures	Operates under a supranational legal framework with harmonized directives and regulations across member states; centralized interpretation by the CJEU; aims for consistency but may slow adaptation due to consensus requirements (Craig & de Búrca, 2020).	Relies on a national civil law system with legislation enacted by Congress; interpreted by the judiciary

		without supranational oversight; allows quicker responses but lacks specific NFT regulations, leading to inconsistencies (Pessoa & Pinheiro, 2021).
Approach to Intellectual Property Rights	Emphasizes harmonization through directives like the InfoSoc Directive and the Trademark Directive; 369oney369 tradition of IP protection with cross-border enforcement mechanisms; challenged by blockchain's decentralized nature (European Parliament and Council, 2001; 2015).	Protects IP rights through national laws; faces enforcement challenges due to technological complexities and lack of specific provisions for digital assets; resource constraints and need for judicial modernization complicate enforcement (Varella & Varella, 2021).
Consumer Protection	Possesses a robust framework with directives aimed at safeguarding consumers in digital markets; ongoing efforts to adapt laws to new 369oney369369ogies; emphasizes transparency, fairness, and protection of consumer rights (European Parliament and Council, 2011).	The Consumer Defense Code provides a 369oney369 foundation but may not fully address NFT

		transaction nuances; drafted before blockchain technology; requires updates to remain effective in the digital age (Almeida & Vaz, 2021).
Taxation and AML Regulations	More advanced in developing tax guidelines and AML regulations for digital assets; implemented directives to combat 370oney laundering; working towards a unified approach through proposed regulations like MiCA (Turina, 2021).	Lacks specific tax guidance and AML regulations for NFTs; leads to uncertainties and potential risks; regulatory bodies are beginning to address these issues; coordination between agencies is needed (Gama, 2022).

Implications and Contributions

The comparative analysis contributes to knowledge by highlighting how legal traditions, regulatory approaches, and societal contexts influence the ability of jurisdictions to respond to technological innovations like NFTs. The study demonstrates that while Europe and Brazil face similar challenges, their responses differ due to structural and cultural factors. Europe's supranational framework and emphasis on harmonization provide consistency but may hinder rapid adaptation. Brazil's centralized system allows for potential agility but suffers from a lack of specific regulations and resources.

By examining these differences, the analysis underscores the importance of legal adaptability and the need for jurisdictions to proactively update their legal

frameworks in response to emerging technologies. The study highlights that effective regulation of NFTs requires not only legal changes but also consideration of societal values, enforcement capabilities, and international cooperation. The insights gained can inform policymakers, legal practitioners, and scholars in crafting strategies that balance innovation with the protection of rights and interests.

The inclusion of the summary table facilitates a clear comparison of key points, enhancing the understanding of the complex interplay between law, technology, and society in different jurisdictions. The analysis thus advances academic discourse on the co-evolution of law and technology, emphasizing the necessity of context-aware legal adaptations in the digital age.

Lacks specific tax guidance and AML regulations for NFTs, leading to uncertainties and potential risks. Regulatory bodies are in the early stages of addressing these issues, and coordination between agencies is needed (Gama, 2022).

CONCLUSION

This study has undertaken a comprehensive examination of the legal challenges associated with the commercialization of non-fungible tokens (NFTs) in Europe and Brazil, utilizing the lens of Science, Technology, and Society (STS) studies to understand the interplay between technological innovation, societal values, and legal frameworks. By conducting a comparative analysis, the research has highlighted how different legal systems respond to the disruptive influence of emerging technologies like NFTs, emphasizing the importance of considering societal contexts in legal adaptations.

The analysis revealed that both Europe and Brazil face significant challenges in regulating NFTs, particularly in areas such as intellectual property rights, consumer protection, taxation, and anti-money laundering (AML) regulations. Europe's supranational legal framework, characterized by harmonized directives and regulations, provides a degree of legal certainty and consistency but may slow adaptation due to the complexities of achieving consensus among diverse member states (Craig & de Búrca, 2020). The European Union's strong tradition of protecting intellectual property rights and its robust consumer protection framework position it well to address some NFT-related issues, although enforcement is complicated by the decentralized nature of blockchain technology.

In contrast, Brazil's national civil law system allows for potentially quicker legislative responses but currently lacks specific regulations addressing NFTs. This absence leads to legal ambiguities and inconsistencies in judicial interpretations (Pessoa & Pinheiro, 2021). Brazil faces challenges in enforcing intellectual property rights due to technological complexities and resource constraints. Consumer protection laws, while providing a foundational framework, may not fully address the nuances of NFT transactions, necessitating updates to remain effective in the digital age (Almeida & Vaz, 2021). Taxation and AML regulations specific to NFTs are underdeveloped, leading to uncertainties and potential risks (Gama, 2022).

The study contributes to academic discourse by highlighting the critical role of legal adaptability in fostering innovation while protecting societal interests. It underscores the necessity for legal frameworks to evolve in tandem with technological advancements, reflecting the co-constructive relationship between technology and society emphasized in STS studies (Jasanoff, 2016). By providing a detailed comparative analysis, the research illuminates the strengths and weaknesses of different legal systems in responding to emerging technologies.

The inclusion of analytical tables and a summary comparison enhances understanding by succinctly presenting key points, facilitating a clearer comparison of Europe and Brazil's legal approaches to NFTs. The findings offer valuable insights for policymakers, legal practitioners, and stakeholders in the digital economy, emphasizing the importance of proactive legal adaptations, stakeholder engagement, international cooperation, and education in navigating the legal complexities of NFTs.

Additionally, the focus on Europe and Brazil, while providing valuable insights, limits the generalizability of the findings to other jurisdictions with different legal traditions and societal contexts. The study does not delve deeply into the economic, cultural, or political factors that may also influence legal adaptations, which could provide a more holistic understanding of the issues.

The study opens avenues for future research to address these limitations and further explore the legal challenges of NFTs. Potential areas for investigation include:

1. **Longitudinal Analysis of Legal Developments:** Tracking the evolution of legal frameworks in Europe and Brazil over time to assess how adaptations occur in response to technological advancements and market changes.
2. **Comparative Studies with Other Jurisdictions:** Expanding the analysis to include additional countries with varying legal systems, such as common law jurisdictions, to compare different approaches and identify best practices globally.
3. **Economic and Cultural Influences:** Investigating how economic priorities, cultural attitudes towards technology and regulation, and political factors influence legal responses to NFTs and other emerging technologies.
4. **Impact of International Cooperation:** Examining the role of international organizations and agreements in shaping national legal frameworks for NFTs, including the effectiveness of harmonization efforts and cross-border enforcement mechanisms.
5. **Technological Solutions and Legal Innovations:** Exploring how technological advancements, such as smart contracts and blockchain analytics, can be integrated into legal frameworks to enhance compliance, enforcement, and dispute resolution.
6. **Stakeholder Perspectives:** Conducting empirical research involving interviews or surveys with industry participants, legal professionals, consumers,

and regulators to gain insights into practical challenges and perceptions regarding NFT regulation.

7. **Ethical and Social Implications:** Analyzing the broader ethical considerations and social impacts of NFTs, including issues related to digital divide, accessibility, environmental sustainability, and the commodification of digital assets.

The commercialization of NFTs represents a significant development in the digital economy, offering new opportunities for creators, businesses, and consumers. However, it also poses complex legal challenges that test the adaptability and responsiveness of legal systems. This study underscores the imperative for legal frameworks to evolve thoughtfully and collaboratively, ensuring that they effectively address the risks while enabling the benefits of technological innovation. By embracing adaptive legal strategies informed by interdisciplinary perspectives, jurisdictions can foster a sustainable and inclusive environment that supports both innovation and the protection of fundamental rights and societal values.

Desafios legais na comercialização de NFTs: uma análise comparativa da Europa e do Brasil

RESUMO

Este estudo examina os desafios legais associados à comercialização de tokens não fungíveis (NFTs) na Europa e no Brasil através das lentes dos estudos de Ciência, Tecnologia e Sociedade (STS). Ao integrar as perspectivas STS, o artigo fornece uma análise abrangente de como os avanços tecnológicos em blockchain e NFTs interagem com as normas sociais e estruturas legais. Os principais desafios jurídicos identificados incluem direitos de propriedade intelectual, proteção ao consumidor, tributação e regulamentações contra lavagem de dinheiro (AML) nos contextos europeu e brasileiro. O estudo ilumina a interação dinâmica entre tecnologia, sociedade e direito, oferecendo perspectivas diferenciadas sobre como os sistemas jurídicos se adaptam às tecnologias emergentes. As conclusões contribuem para o discurso acadêmico, destacando a necessidade de quadros jurídicos adaptativos face à inovação tecnológica e fornecendo uma base para futuras investigações neste domínio.

PALAVRAS-CHAVE: Criptoativos. Tokens não Fungíveis. Blockchain. Desafios legais NFT; Ciência, Tecnologia e Sociedade; CTS.

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