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Navigating the Web3 Revolution: Regulatory Strategies for Kenya

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ABSTRACT

The integration of technology into daily human lives has become indispensable, shaping society and emphasizing the role of humans in the development of society. This indispensable integration is illustrated by the global rise of Web3, a decentralized application ecosystem that utilizes advanced technologies, such as crypto assets, non-fungible tokens (NFTs), decentralized finance (DeFi), decentralized autonomous organizations (DAOs), and the Metaverse. These technologies offer significant benefits alongside unique risks and challenges, necessitating innovative regulatory strategies to address them. The inherent tension between promoting innovation and safeguarding citizens' interests requires a flexible and comprehensive regulatory framework for Web3 in Kenya, capable of adapting to the rapidly evolving technological landscape while simultaneously managing emerging risks. This research aims to identify key principles for developing effective Web3 regulations and argues for Kenya's regulatory recognition of Web3 technologies, emphasizing potential benefits such as increased innovation, digital sovereignty, financial independence, and economic development. It also explores different regulatory strategies, such as self-regulation, co-regulation, and the implementation of co-regulatory tools like public-private dialogue (PPD). The findings propose that Kenyan regulators should adopt flexible, forward-thinking regulatory strategies that can navigate the complexities introduced by these transformative technologies.

Keywords: Web3 Regulation, Decentralized Technologies, Crypto Assets, NFTs, Public-Private Dialogue (PPD), Kenya's Digital Innovation

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I. INTRODUCTION

In recent years, regulatory scrutiny of digital assets has intensified globally and locally, with Kenya experiencing similar trends. This intensified focus is attributed to the substantial growth in retail and institutional adoption of digital assets, including cryptocurrencies, leading to rapid market capitalization gains but also notable volatility (PwC, 2022). However, this growth has been accompanied by a troubling decline in consumer trust due to high-profile failures like the collapse of FTX Trading Limited, which was a leading cryptocurrency exchange company (Kapoor, 2023), fraudulent activities, scams, and mismanagement of customer funds within the crypto industry (PwC, 2022; Trozze et al., 2022). These issues emphasize the global necessity for a comprehensive regulatory strategy and supervisory framework to strengthen consumer protection and address the complex challenges in the digital asset landscape (PwC, 2022), including Kenya's growing involvement in this space.

Web3, a nascent paradigm characterized by a decentralized internet ecosystem, is rapidly reshaping the digital landscape (McKinsey & Company, 2023). It represents a shift from centralized platforms to a network where users have greater control over their data and digital assets, facilitated by Blockchain technology (El-Khouri & Schröder, 2023; McKinsey & Company, 2023). Its potential to revolutionize sectors such as finance, asset management, and governance is undeniable (Habib et al., 2022). However, according to Gohil *et al.* (2023), the rapid evolution of Web3, its decentralized and borderless nature, coupled with its intricate technological underpinnings, outpace traditional regulatory frameworks.

While Kenya has yet to experience these challenges on a significant scale, the nature of Web3 introduces profound difficulties and critical gaps. These include judicial interpretation of code-based smart contracts (York & Wong, 2016), the application of judicial review to government services implemented through

smart contracts (Chin Li Ting, 2022), and the adaptation of corporate governance principles to decentralized autonomous organizations (DAOs) (De Filippi & McMullen, 2018). Within the context of judicial review for instance, the autonomous and algorithmic nature of smart contracts when deployed in public service processes such as permit issuance, may inadvertently embed hidden biases—thereby necessitating judicial oversight (Atzori, 2017). This raises critical concerns about the potential for smart contracts to overstep the boundaries of delegated legislative authority, exhibiting characteristics of unreasonableness and procedural unfairness that could potentially render the smart contract decision-making mechanisms unlawful (Leewis et al., 2021).

Moreover, DAOs represent a paradigm shift in organizational governance, utilizing Blockchain technology to facilitate decentralized, transparent, and collective decision-making processes (Lai et al., 2023). Unlike traditional organizations which are governed by top-down, centralized frameworks, DAOs empower members to propose and vote on decisions, creating a distributed model of governance that operates *via* smart contracts (Bellavitis, et al., 2022). This novel structure challenges conventional corporate governance models and highlights legal ambiguities due to the lack of identifiable legal entities or jurisdictional boundaries (De Filippi et al., 2020). Uniswap, a globally recognized DAO and decentralized exchange, exemplifies the potential of Blockchain technology to facilitate peer-to-peer financial transactions without central operators (Leech, 2021; Uniswap, 2024; Digital Assets, 2023).

Accordingly, regulatory ambiguity surrounding these technologies constitutes a significant impediment to their widespread adoption, and stakeholders may exhibit a pronounced reluctance to implement protocols that might be in contravention of future regulatory frameworks (Hacker et al., 2019; Mohammed Abdul, 2024). Therefore, Kenya stands at a critical juncture in its digital trajectory, as the emergence of Web3 presents immense oppor-

tunities for economic and societal progress, yet it also presents complex regulatory challenges.

It is worth noting that a significant constraint of this paper lies in its apparent emphasis on cryptocurrency as the dominant technology within the Web3 ecosystem. This focus is largely attributable to the significant regulatory attention that cryptocurrencies have garnered globally (PwC, 2022), including in Kenya. Cryptocurrencies, due to their financial implications, have drawn substantial regulatory attention, particularly as they pose challenges to the effectiveness of traditional monetary systems and raise concerns regarding financial stability (FSB, 2023). Additionally, the high incidence of fraudulent activities associated with cryptocurrencies has underscored the urgent need for effective consumer protection measures. This constraint is further compounded by the theoretical nature of the proposed regulatory frameworks, which, as discussed in subsequent sections of this paper, have yet to be effectively implemented in Kenya. Furthermore, the paucity of research on alternative regulatory approaches for Web3 technologies within Kenya significantly impedes a more comprehensive understanding of the potential regulatory landscape.

In light of the considerable regulatory scrutiny directed at cryptocurrencies, this paper endeavors to show the need for a broader regulatory approach that encompasses the diverse range of Web3 technologies. Web3, however, extends far beyond the confines of cryptocurrency (Islam et al., 2020), encompassing a wide range of technologies, notably Blockchain-the foundational technology that enables decentralization and decentralized applications such as DAOs. This paper advocates for a more flexible and inclusive regulatory approach, one that integrates co-regulatory models, including mechanisms like DAOs and standardized protocols in order to address the diverse and continually evolving technologies within the Web3 ecosystem. This broader perspective further justifies the paper's endeavor to define both Blockchain, as the core infrastructure of Web3, and Web3 itself, which is explored later in more detail.

Accordingly, this paper aims to achieve the following objectives. Part II provides a foundational understanding of Blockchain and Web3, offering a comparative analysis of Web1, Web2, and Web3 in the context of regulatory frameworks. Part III explores the broader challenges in regulating the Web3 ecosystem, while Part IV outlines Kenya's existing regulatory approach in the Web3 space. Part V examines recommendations for effective regulatory practice, and investigates various regulatory strategies for Web3 in Kenya, such as self-regulation, co-regulation and the application of existing laws. In this section, it is argued that a co-regulatory model, combined with a hybrid approach that incorporates the creation of new laws alongside the adaptation of existing legal frameworks, offers an especially effective mechanism for addressing the unique regulatory challenges Web3 presents. Part VI concludes by highlighting the importance of adopting an appropriate regulatory strategy that will enable Kenya to navigate the complexities of Web3, balancing innovation with effective oversight. Through this analysis, the paper seeks to contribute to the ongoing discourse on developing an optimal regulatory framework for Web3 in Kenya – one that can constructively manage the balance between regulation and the potential advantages offered by Web3 technologies.

II. BLOCKCHAIN AND WEB3

A. Blockchain

Blockchain technology, a transformative innovation, has introduced a new paradigm for governing human and business activities, simply functioning as a decentralized ledger for recording transactions (Islam et al., 2020; Sarmah, 2018). Further, unlike centralized systems controlled by a single entity like a bank, Blockchain operates on a shared or distributed global network of computers. This peer-to-peer network allows all participants transparent access to transaction records, preventing any single entity from monopolizing the network (Sarmah, 2018).

According to Sultan *et al.* (2018), Blockchain is also defined by several key characteristics. It is immutable, meaning that it provides a permanent and tamper-proof record of transactions, ensuring data integrity. It is decentralized, with the Blockchain ledger stored across a network of computers or nodes, allowing any participant to access and copy the entire ledger, thus eliminating central points of failure. Likewise, it is consensus-driven, meaning that transactions are independently verified through consensus models, such as Proof of Work, which validate and confirm each block to ensure trust and integrity in the system. Lastly, it is transparent, as its open ledger allows any party to access and audit transactions, promoting accountability (Sultan et al., 2018).

Although Blockchain technology gained prominence as the foundational structure for the Bitcoin cryptocurrency, its versatile features have propelled its evolution beyond cryptocurrency applications (Islam et al., 2020; Habib et al., 2022). Blockchain's inherent characteristics—such as transparency, security, decentralization, and immutability—have enabled its adoption across diverse sectors, including finance, intellectual property protection, healthcare, legal systems, and supply chain management (Consensys, 2024; Min Xu et al., 2019; Islam et al., 2020). These applications highlight Blockchain's potential to drive innovation and efficiency in addressing sector-specific challenges.

Blockchain therefore serves as the foundational architecture for Web3. Its structure supports decentralization, transparency, security, and user sovereignty, particularly in data management that are central to Web3's ethos (Bells, 2024; Tosh Marketing, 2024). Accordingly, a comprehensive definition of Web3 as a concept is provided below.

B. Web3

The evolution of the internet can be characterized into three distinct eras. Web1, the inaugural phase, was characterized by

static, read-only pages, which used hyperlinks to direct users to external websites (Connor and Sarkar, 2024; Ragnedda and Destefanis, 2019). Users were passive consumers of information, unable to actively contribute or interact with the content (Ragnedda and Destefanis, 2019). The website known as 'One Terabyte of Kilobyte Age Photo Op' is a classic example of this era.

Web2, the subsequent era, introduced interactivity and user-generated content. Websites such as 'Blogger' empowered users to actively create and edit content actively, transforming the internet from a passive medium to an active and participatory space. At the time, the shift from a read-only to a write-able web marked a significant advancement in the evolution of the internet (Ragnedda and Destefanis, 2019).

Web3 is the third era of the internet, predicated on Blockchain technology to facilitate decentralized networks obviating the need for central points of control (Ragnedda and Destefanis, 2019). Web3, a concept proposed by Ethereum's co-founder Gavin Wood (Wang et al., 2022; Wood, 2018), can be further represented as a convergence of revolutionary technologies and components which encompass Blockchain, smart contracts, decentralized applications (dApps), cryptocurrencies, NFTs, DeFi, etc, (Web3.0 Research Group, 2022).

Marchetti contends that Web3 seeks to 'transform the very infrastructure of the internet' by building on Web2 technologies, and addressing some of its glaring limitations (Marchetti, 2023; Gan et al., 2023), while introducing innovations that significantly reduce dependence on single, centralized entities (Ragnedda and Destefanis, 2019; Wang et al., 2022). Further, it facilitates the storage and transfer of value through instruments such as cryptocurrencies and tokens (DeVries, 2016). It also empowers users with enhanced autonomy, control, and security in their digital interactions (Ragnedda and Destefanis, 2019). Unlike Web2, where user data is predominantly owned, controlled, and monetized by centralized entities such as the big tech firms- Goo-

gle, Amazon, Meta, Apple and Microsoft (GAMAM)- Web3 platforms are generally founded on open-source principles, promoting transparency, collaborative development, and continuous innovation (Ragnedda and Destefanis, 2019; Nabben, 2023).

The above digest is to be taken with monition, as the idea that Web3 inherently leads to a more equitable and resilient internet is aspirational but not universally accepted (Nabben, 2023; Bryant, 2024). There are significant challenges and potential drawbacks, which include accessibility issues *vis-à-vis* access to technology and internet connectivity, digital literacy, regulatory uncertainty as well as implicit bias occasioned by the complexity of the entire technologies which marginalize non-technical operators (Krause, 2024). Additionally, persistent security concerns in the digital space, such as fraud and scams, alongside the high energy consumption associated with certain Blockchain protocols like Bitcoin, have raised vital concerns (Krause, 2024). Furthermore, the volatility of cryptocurrency markets and the risk of centralization, where a small number of individuals or entities effectively control significant portions of the system despite claims of decentralization, present notable challenges to the Web3 ecosystem (Ray, 2023).

C. Comparative Overview: Web1, Web2, and Web3 Regulation

Web3 has attracted substantial regulatory scrutiny at a global scale. Regulating Web3 presents formidable challenges that starkly contrast with the relatively stable frameworks governing Web1 and Web2 (Spheron Network, 2024). In Web2, regulatory mechanisms are directed primarily at centralized entities, facilitating oversight and compliance by targeting identifiable actors within established legal structures (Schrepel, 2023). For example, the EU's General Data Protection Regulation (GDPR) (Wolford, 2024) and Kenya's Data Protection Act, 2019 (ODPC), impose clear obligations on data controllers, enabling regula-

tors to enforce privacy standards and sanction non-compliance (Wolford, 2024; ODPC). Moreover, existing legal frameworks, such as contract law and consumer protection legislation like the Consumer Protection Act, 2012 or the Kenya Information and Communications Act (KICA) (Chapter 411 of the Laws of Kenya), govern relationships between consumers and centralized platforms, particularly in e-commerce platforms (Nzomo, 2018). Legal precedents concerning browsewrap and clickwrap agreements, while not extensively examined within Kenyan jurisprudence, have received notable attention in US case law (Ngeta, 2020; Nzomo, 2017). For example, in cases such as *Sarchi v. Uber Technologies, Inc., 2022 ME 8, 268 A.3d 258*. These legal precedents further support regulatory oversight by defining contractual interactions between centralized entities and consumers on Web2 platforms (Lam, 2022).

Conversely, Web3's decentralized and pseudonymous nature undermines traditional regulatory methods, creating a system inherently resistant to oversight (De Filippi et al., 2020; Bakare *et al*., 2024). Unlike Web2, where regulators can impose compliance on identifiable entities within specific territories, Web3 operates through distributed nodes or computers and pseudonymous actors, complicating enforcement (Bakare *et al*., 2024) under frameworks like the GDPR, which assumes identifiable data controllers (Wolford, 2024). DAOs, which operate without a conventional corporate structure, further exemplify this challenge by dispersing authority among global computers, making it difficult for regulators to hold specific individuals or entities accountable (Bellavitis, et al., 2022; De Filippi et al., 2020). Additionally, Web3 lacks universally accepted standards like Transmission Control Protocol/Internet Protocol (TCP/IP) standards that reportedly stabilized Web2, leaving regulatory bodies without universally accepted or interoperable frameworks to govern its operations (IBM, 2024; Lin, 2023; Metalex Legal, 2023). Moreover, Web3's rapid innovation perpetuates a regulatory lag as emerging technologies such as DeFi or cryptographic proofs

evolve faster than regulatory adaptation (Gohil et al., 2023; Perani, 2018). Thus, regulations like Kenya's Data Protection Act, 2019 originally crafted for Web2, may be demonstrably insufficient in a Web3 environment where users manage their own data autonomously and through cryptographic means (Ragnedda and Destefanis, 2019). Therefore, regulators must explore innovative strategies to effectively navigate the distinctive and evolving complexities of Web3. These strategies will be further examined in the subsequent sections of this paper.

III. CHALLENGES IN REGULATING THE WEB3 ECOSYSTEM

While regulatory intervention is intended to serve the public interest, several challenges impede the effective formulation and implementation of Web3 regulatory frameworks within the Kenyan context.

Existing regulatory frameworks often exhibit outdated provisions that are inadequate for addressing the novel business models and technologies of Web3. The Companies Act, 2015, is one such example. The Companies Act, 2015 (Companies Act, 2015) does not expressly recognize DAOs. Consequently, incorporating a DAO under this legislation presents significant challenges due to the absence of provisions accommodating decentralized governance structures. Similarly, Kenya's current legal framework does not formally recognize digital assets as property. The existing Land Acts and Intellectual Property laws such as the Copyright Act, 2001, do not account for the unique nature of digital assets, including cryptocurrencies and NFTs (Issaias, 2021). This gap creates legal uncertainties regarding the ownership and protection of digital assets under existing property laws.

There is also a notable lack of coordination among regulators at different government levels, resulting in a disjointed mix of policies. Traditional bureaucratic structures operate in silos, unable to respond swiftly in a technologically competitive and high-

ly collaborative environment (Dostmohammad & Long, 2015). Dostmohammad and Long (2015) claim that this often results in a piecemeal and reactive approach to regulatory issues, similar to playing 'mole poking' or engaging in exception handling processes. For example, the ODPC and Communications Authority of Kenya (CAK) issued warnings about Worldcoin's (a cryptocurrency project) data privacy practices without immediate, coordinated responses from other regulatory bodies, highlighting the fragmentation in regulatory oversight (Mwangi, 2023; Communications Authority of Kenya, 2023). The subsequent formation of an *ad hoc* parliamentary committee to address Worldcoin's alleged data privacy breaches further illustrates the lack of cohesive regulatory action, with different entities reacting separately to emerging issues (Ogonjo & Kitili, 2023; Parliament of Kenya, 2023).

In the Web3 space, diverse business interests and use cases require innovation and profitability (Ruas et al., 2023). However, the current regulatory landscape prioritizes the digital financial aspect, particularly evident in the three percent Digital Asset Tax on cryptocurrency transactions (Kenya Revenue Authority, 2023). This rigid approach presents a twofold challenge. Firstly, the tax burden disproportionately targets crypto users, crypto payment service providers, and crypto exchanges, potentially inhibiting the growth and development of innovative financial solutions within the Web3 space. Secondly, the current approach neglects the broader utility of Blockchain technology (Ministry of ICT Blockchain Task Force, 2019). Its applications extend far beyond cryptocurrencies, encompassing functionalities like maintaining transparent record systems in government registries, auditing supply chains, and facilitating secure smart contract execution (Shleifer, 2005). A comprehensive regulatory approach needs to consider these diverse applications of Web3. Such a framework would facilitate responsible growth within the digital financial ecosystem and enable the development of transformative Web3 applications across various sectors beyond finance.

Regulators also often face criticism for being ineffective, politically motivated, incompetent, corrupt, and influenced by the institutions they are supposed to oversee (Shleifer, 2005; Mwamisi, 2024). The Ethics and Anti-Corruption Commission (EACC), for example, has been criticized for its perceived ineffectiveness and political interference, which has hindered its ability to address high-profile corruption cases effectively (Mwaniki, 2017). This regulatory capture can lead to regulations benefiting established players or incumbents at the expense of new competitors and the public interest (Shleifer, 2005).

Further, the pursuit of flexible and proportionate regulations in the dynamic Web3 landscape is essential to foster innovation and adaptability. However, this approach carries the inherent risk of another form of regulatory capture, wherein powerful industry stakeholders unduly influence policymaking. This phenomenon, documented by Shleifer (2005), is exacerbated in complex rapidly evolving sectors like Web3. Gai *et al.* (2019), also highlight the vulnerability of regulatory agencies to undue industry influence, particularly when technical expertise is concentrated among a few large firms. In the Web3 space, this issue is exacerbated by the technology's complexity and rapid evolution, leading regulators to rely heavily on industry input, which can compromise regulatory independence and objectivity (Shleifer, 2005). A salient example of this dynamic is evident in the potential benefits accrued by corporations such as Meta (formerly Facebook) and Google from data privacy regulations, such as the European Union's General Data Protection Regulation (GDPR) (Brinnen & Westman, 2019; Kostov & Schechner, 2019). Critics suggest that the resulting regulations, while robust, include loopholes that favor these large companies, making compliance more difficult for smaller competitors Brinnen & Westman, 2019; Wakabayashi and Satariano, 2018).

Regulation can sometimes be misused for public abuse, where rules are manipulated to serve the interests of the politically powerful at the expense of the politically weak (Shleif-

er, 2005). Shleifer (2005) further contends that the creation and enforcement of public rules can provide opportunities for those in power to expropriate resources or benefits from vulnerable groups and favor their own interests. Regulations might be designed to impose burdens on small businesses or new market entrants while benefiting established companies with strong political connections (Shleifer, 2005; Papenfuß & Schmidt, 2020). A notable example of regulatory misuse in the Web3 space is the legal dispute between Coinbase and the United States (US) SEC (Frankel, 2024). The SEC's stringent enforcement actions against Coinbase and similar firms like DEBT Box have been criticized for disproportionately affecting newer and smaller crypto businesses (De, 2024; Kuhn, 2024). Shleifer argues that such regulations impose significant compliance burdens on emerging players, while established financial institutions may benefit from a more lenient regulatory environment (Shleifer, 2005).

Although coordination is a legitimate challenge, it is important to account for inherent constraints faced by regulators, including resource constraints and budgetary limitations (GL Solutions, 2024), divergent priorities (Kane, 2005), and institutional fragmentation (Kalodimos, 2024). Indeed, the distribution of regulatory authority across various agencies may enhance flexibility, enabling tailored approaches to distinct Web3 sub-sectors and emerging risks. In this light, what may appear as fragmentation could contribute to a more agile and sector-sensitive regulatory landscape (Xu, 2024). Lastly, while the risk of regulatory capture is rightly acknowledged, this paper's stance may tend to lean towards an overly pessimistic perspective. Though a potential threat, regulatory capture is not inevitable. Careful regulatory design, transparency, and inclusive public participation can mitigate this risk, embedding checks and balances that ensure responsiveness to both innovation and public interest (Wren-Lewis, 2011).

IV. THE KENYAN STRUGGLE

Kenya is confronted with the imperative to engage with the transformative potential of Africa's Web3 development, as evidenced by initiatives such as Valour's exploration of digital asset exchange-traded products (ETPs) on the Nairobi Stock Exchange (NSE) (Andersen, 2024; Zimwara, 2024), and the government's collaboration with Marathon Digital Holdings to integrate renewable energy into Bitcoin mining projects (Khalil, 2024). These developments display Kenya's fertile ground for Web3 adoption and accentuate the urgency for regulators to embrace this wave of technological change.

Notably, the analysis under this part reveals a pronounced emphasis on cryptocurrency, a focus not incidental but reflective of Kenya's regulatory priorities. Kenyan authorities have concentrated primarily on cryptocurrency within the Web3 landscape, largely due to the immediate imperatives safeguarding monetary stability and protecting consumers from the fraudulent aspects often associated with digital assets (Central Bank of Kenya, 2015).

As alluded to in the introduction, this selective emphasis likely stems from both pragmatic and perceptual factors. Cryptocurrencies, given their significant implications for financial stability and consumer protection, have naturally attracted regulatory scrutiny (PwC, 2022). At the same time, the technical complexity of Web3 technologies (Orlando, 2023) as a whole may have contributed to certain misunderstandings and misinterpretations, shaping a regulatory approach that prioritizes cryptocurrency oversight over the broader Web3 ecosystem. While this focus presents a limitation in this paper's scope, there remains the potential for Kenya's regulatory landscape to evolve toward a more balanced understanding of Web3 (Momanyi, et al., 2020). The subsequent sections of this paper explore possible regulatory pathways that could enable a more comprehensive engagement with the assorted components of Web3 technology.

A. The Central Bank of Kenya's response

The Central Bank of Kenya (CBK), as the country's monetary authority, is primarily concerned with formulating and implementing monetary policies designed to achieve and maintain price stability (Central Bank of Kenya, 2024). Its regulatory purview extends to payment systems and payment service providers (PSPs), through the National Payment System Act, 2011 (Sections 11-13), allowing it to exert influence over cryptocurrency-related activities (Central Bank of Kenya, 2022).

In line with the above, the CBK issued a public notice in December 2015, explicitly cautioning against the use of virtual currencies like Bitcoin due to their decentralized nature and associated risks. This notice also clarified that virtual currencies were not recognized as legal tender in Kenya (Central Bank of Kenya, 2015). The CBK underscored several risks associated with cryptocurrencies: their untraceable and anonymous nature, making them susceptible to criminal misuse; the unregulated status of global exchange platforms, leaving consumers vulnerable to financial loss without legal recourse; and the speculative nature of their value, leading to high volatility and potential losses for users (Central Bank of Kenya, 2015). Additionally, a 2015 Banking Circular advised banks to refrain from engaging in transactions involving virtual currencies (Central Bank of Kenya, 2015). In 2018, further warnings were issued in conjunction with other financial regulators about fraudulent financial services, urging the public to verify the legitimacy of financial institutions (Central Bank of Kenya, 2018; National Treasury & Economic Planning, 2023).

CBK's initial position evolved in February 2022, when the CBK published a Discussion Paper evaluating the potential for Central Bank Digital Currency (CBDC) in Kenya's retail and cross-border payment sectors. While highlighting benefits such as financial stability, enhanced cross-border payments, and innovation, the paper also recognized risks like disintermediation

of banks and financial exclusion (ALN, 2022; Central Bank of Kenya, 2022). By June 2023, after reviewing public feedback and global developments, the CBK determined that the immediate implementation of a CBDC was not a priority. Instead, it underscored the adequacy of existing payment systems in addressing Kenya's financial challenges. The CBK committed to continuing its monitoring of CBDC developments, maintaining its cautious approach to digital currency adoption (Central Bank of Kenya, 2023).

B. The Court's response

The legal framework for cryptocurrency regulation was further articulated in the case of Wiseman Talent Ventures v Capital Markets Authority [2019] eKLR. Wiseman Talent Ventures (the Plaintiff) accused the Capital Markets Authority (CMA) (the Defendant) of unlawfully disrupting their cryptocurrency business, KeniCoin, through a cautionary statement and suspension of their mobile payment channel, causing significant financial losses. The Plaintiff sought a temporary injunction against CMA, arguing that the authority had no jurisdiction over cryptocurrencies. CMA defended its actions, citing its mandate under the Capital Markets Act (*Chapter 485A of the Laws of Kenya*) to protect investors and highlighting discrepancies in the Plaintiff's business operations and claims. Honorable Muigai J. dismissed the Plaintiff's application, finding insufficient evidence to support the business's legitimacy and regulatory compliance.

The court emphasized the necessity of regulatory oversight to protect the public from potential fraud in the unregulated cryptocurrency market. Justice Muigai also applied the 'Howey Test' from the United States case of *Securities Exchange Commission (SEC) vs W.J Howey Co.328 US 293 (1946)*, determining that cryptocurrency qualifies as a security. This is due to its nature of involving an investment of money in a common enterprise, with profits dependent on the efforts of others. This interpretation was supported by sections of the CMA Act that

empower the CMA to safeguard investor interests and develop a regulatory framework for electronic commerce, being Sections 2(j), 11(1) (3)(d) & (w) and 12A. Additionally, the Plaintiff's lack of transparency and accountability was found to contravene the national values and principles enshrined in Articles 3(1) and 10 of the Constitution (Constitution of Kenya, 2010).

This case reinforces the need for businesses to comply with existing financial regulations, even as new frameworks evolve. It also reflects an obligation to safeguard investor confidence in the rapidly evolving Web3 space and recognizes that while specific regulations for cryptocurrencies and Web3 may still be developing, existing laws provide a foundation for oversight and protection.

C. Other institutional and concerted regulatory responses

Despite the CBK's warnings about the risks associated with cryptocurrencies, a 2022 policy brief from the United Nations Conference on Trade and Development (UNCTAD) estimated that approximately eight-point five percent of the Kenyan population owned cryptocurrencies (UNCTAD, 2022). This figure demonstrated a notable penetration of cryptocurrencies despite regulatory concerns (Ng'ang'ira & Nzaku, 2023). In response to these developments, the Joint Financial Sector Regulators Forum (JFSRF), which includes the CBK, the CMA, and other financial regulators, considered a recommendation from the Treasury to establish a comprehensive oversight framework for crypto assets (Joint Financial Sector Regulators Forum, 2022). According to Ng'ang'ira & Nzaku (2023), this move signified a shift from previous warnings and reflected a collaborative effort to create a structured regulatory environment for digital currencies (Ng'ang'ira & Nzaku, 2023).

In tandem with these efforts, the CMA introduced a legislative proposal – the Capital Markets (Amendment) Bill, 2023. Ng'ang'ira & Nzaku (2023) express that the bill proposed de-

fining Blockchain and digital currencies, aiming to incorporate them within the securities framework (Ng'ang'ira & Nzaku, 2023). It mandated the licensing for new cryptocurrency products, required traders to maintain transaction records and pay taxes, and proposed using Blockchain technology for efficient and secure transaction tracking (Ng'ang'ira & Nzaku, 2023). It further sought to enhance market transparency, improve regulatory oversight, and address concerns related to crime and terrorism financing (HKTDC Research, 2024).

While the bill aimed to incorporate the growing cryptocurrency sector into the formal tax framework and improve regulatory oversight, its focus on taxation and regulatory oversight arguably overshadowed the need for fostering innovation within the digital asset space (Ng'ang'ira & Nzaku, 2023). Ng'ang'ira & Nzaku (2023) point out that despite its improvements in consumer protection and economic stability, the bill lacked crucial provisions for effectively regulating cryptocurrency companies and exchanges.

Although the bill underwent its final comprehensive deliberation in 2023, as it progressed to the second reading stage in the National Assembly, ongoing discourse persists regarding the adequacy of its provisions in accommodating the sector's dynamic evolution and its potential economic implications for Kenya (Ng'ang'ira & Nzaku, 2023).

In 2019, the Ministry of ICT, as it was known then, commissioned a formal task force to produce the Government of Kenya Blockchain Report. Walubengo (2024) observes that following the report's publication, governmental engagement with Blockchain matters has been conspicuously absent, with little to no subsequent action or discourse on the subject.

However, the year 2022 and 2023 were marked by substantial regulatory developments in Kenya's digital asset landscape. In June 2023, the CBK released a *Technical Paper on Crypto Assets* as an annex to the report on *Discussion Paper on Central*

Bank Digital Currency: Comments from the Public (Central Bank of Kenya, 2023). This technical paper summarized recent key developments in the crypto assets sector, driven by heightened instability in the global market. This instability underscored the pressing need for a comprehensive review and understanding of both the innovation inherent in crypto assets and the associated technological risks in order to formulate effective and informed regulatory and policy decisions (Central Bank of Kenya, 2023). This Technical Paper aligns with scholarly discussions on the need for regulatory bodies to develop a refined understanding of Web3 technologies to mitigate associated risks (Roy, 2023; Cumming et al., 2019).

As a segue into the next legislative move, the Finance Act of 2023 introduced a Digital Asset Tax (DAT), imposing a three percent tax on income derived from the transfer or exchange of digital assets, including cryptocurrencies (KRA, 2023; Omondi et al., 2023). As Kivuva observes, the implementation of the DAT underlines the increasing importance of virtual currencies in Kenya's economy (Kivuva, 2024). However, it has ignited considerable controversy and scrutiny. Critics argue that a stringent tax regime may potentially divert cryptocurrency trading into the informal economy, resulting in diminished tax revenue and heightened investor risks (Adeyemo, 2023), and increased costs for consumers, potentially hampering wider adoption (Mwencha et al., 2024).

Further, the Anti-Money Laundering and Terrorism Financing Mutual Evaluation Report 2022, issued by international regulatory bodies, highlighted Kenya's non-compliance with the Financial Action Task Force (FATF) Recommendation 15 (National Treasury & Economic Planning, 2023; Esaam, 2022). This recommendation mandates the establishment of regulatory frameworks for Virtual Assets (VAs) and Virtual Asset Service Providers (VASPs) to combat money laundering and terrorism financing (National Treasury & Economic Planning, 2023). The report identified significant regulatory gaps, emphasizing the

urgent need for Kenya to implement licensing and registration requirements for VASPs, and establish a supervisory framework to address AML/CFT concerns (Esaam, 2022). VAs as defined by the FATF, are digitally represented values, encompassing cryptocurrencies like Bitcoin and other tokenized assets such as non-fungible tokens (NFTs) and stablecoins, that facilitate electronic transfer and trading. VASPs are entities that support the trading, transfer, and storage of VAs, including exchanges and wallet providers (FATF, 2019).

Nevertheless, in response to the FATF Recommendation 15, Blockchain Association of Kenya (BAK) drafted the Virtual Assets Service Providers (VASP) Bill, 2024 (Oraro & Co., 2024). This proposed legislation aims to establish comprehensive regulatory oversight over Kenya's digital asset market (Ekhator, 2024). The bill seeks to provide clear legal definitions and operational guidelines for VASPs, ensuring they adhere to stringent regulatory standards (Blockchain Association of Kenya, 2023). Despite expectations, the bill has yet to advance through the parliamentary stages. Indeed, this initiative is aligned with global best practices where detailed regulatory frameworks are considered important in cultivating a secure and innovative digital asset (Blandin et al., 2020).

As elucidated in the preceding analysis, this section demonstrates a substantial degree of historical contextualization regarding Kenya's regulatory approach to cryptocurrencies, yet several limitations arise from the composition of the information. Firstly, the predominant focus is on the cautious, risk-averse approach taken by the CBK, emphasizing the negative aspects of cryptocurrencies, such as their potential for criminal misuse and speculative volatility (Central Bank of Kenya, 2015). This is because the CBK's initial stance solely emphasized the risks associated with virtual currencies without acknowledging their potential benefits, such as financial inclusion and cost-efficient remittances. This reflects a risk-centric bias that may inadvertently discourage innovation and encumber economic potential (Momanyi et al., 2020). Scholars such as Momanyi *et al.* (2020) argue that such a perspective risks foreclosing avenues

for balanced regulatory engagement, where both opportunities and risks are considered, potentially arising from a preference for centralized control and stability. This one-sided perspective may unintentionally reinforce the stereotype of cryptocurrencies or Web3, as inherently risky and unregulated, without fully considering their transformative potential.

Furthermore, the overview of the judiciary's response in the case of Wiseman Talent Ventures v Capital Markets Authority [2019] eKLR may reflect a lack of critical perspective because of the High Court's limited exposure to cryptocurrency and Web3 cases. This limitation is further evidenced by the sparse application of international legal tests, such as the *Howey Test*, and suggests a need for more judicial capacity-building in Web3-related adjudication.

In this regard, while progress has been made, the regulatory environment remains underdeveloped and demands further refinement to strike an appropriate balance between innovation and effective oversight.

V. WEB3 REGULATORY STRATEGIES FOR KENYA

Before examining the strategies for regulation, it is crucial to recognize the substantial diversity in regulatory frameworks. These can take many forms, including laws, rules and regulations, standards, product specifications, codes (De Filippi & Hassan, 2018), design, process and performance standards, information disclosure mandates, taxes, and self-regulation (Coglianese, 2012).

Additionally, regulatory approaches can be analyzed through four primary components: the regulator, the regulatory target, the command, and the consequences (Coglianese, 2012). The regulator is responsible for formulating and enforcing the rules, while the regulatory target refers to the subject of these rules. The command outlines the required actions or outcomes, and the

consequences serve to reinforce compliance. The selection of the target and command plays a significant role in determining the flexibility and effectiveness of the regulatory framework (Coglianese, 2012). Outcome-oriented commands typically provide businesses with greater flexibility, allowing them to choose the most suitable methods to achieve compliance (Coglianese, 2012). Accordingly, Kenya's regulatory authorities must carefully consider these components to devise regulations that are not only adaptable but also supportive of both innovation and economic development.

Effective regulation in Kenya's Web3 industry should rely on several necessary but visibly absent crucial characteristics, each vital for ensuring the industry's success and the stability of the digital landscape. Harmonization is essential, involving the alignment of regulations across different levels of government (Securities & Futures Commission of Hong Kong, 2021). This ensures consistency and clarity, reducing confusion and facilitating compliance for businesses operating nationwide.

Comprehensiveness is also key (Securities & Futures Commission of Hong Kong, 2021). Kenya's ideal Web3 regulatory framework must address all relevant aspects, including licensing requirements and robust safeguards to ensure the protection of both investors and consumers. Such a holistic approach will ensure that all potential risks are mitigated and that the regulatory environment supports sustainable growth and innovation in the Web3 space (Securities & Futures Commission of Hong Kong, 2021).

Further, a risk-based approach can potentially tailor regulations to address the specific threats posed by different activities within Kenya's Web3 sector. This method allows for precise oversight, applying stringent measures to high-risk activities while employing lighter regulation for lower-risk endeavours (Securities & Futures Commission of Hong Kong, 2021). Key factors within this risk-based approach encompass financial exposure, operational complexity, and potential market impact. Utilizing

historical data and incident analysis on past Web3 activities could provide valuable insights for regulators into past failures and emerging threats, thereby facilitating proactive risk management (Aven, 2016).

Additionally, regulatory flexibility and proportionality are crucial for navigating the dynamic Web3 landscape in Kenya, ensuring responsiveness to evolving circumstances and proportionate risk management. A standardized regulatory approach is insufficient given the industry's heterogeneity and rapid evolution. Instead, regulations must be agile, capable of accommodating technological innovation and fluctuating market conditions (Securities & Futures Commission of Hong Kong, 2021).

The multifaceted nature of Web3 applications necessitates a varied regulatory approach. Kenya could consider four primary regulatory strategies: self-regulation, co-regulation, adapting existing legal frameworks, and establishing new regulatory frameworks.

Self-regulation refers to a governance model where industry participants autonomously establish rules, guidelines, and standards to govern their interactions and conduct within the technological ecosystem (Finance Magnates Contributors, 2023). The potential of this model is exemplified in the Blockchain industry's experience with the Enterprise Ethereum Alliance (EEA) (EEA, 2024) and the Blockchain in Transport Alliance (BiTA) (GBBC, 2024), which are developing industry standards and contributing to the overall maturity and credibility of the sector (Tapscott & Vargas, 2019). While this approach has the potential to boost innovation and leverage industry expertise, it is susceptible to regulatory capture and lacks the enforcement mechanisms of government oversight (Shleifer, 2005; OECD, 2014; Papenfuß & Schmidt, 2020).

To address these limitations, co-regulation offers a hybrid approach that merges elements of self-regulation with government oversight (Australian Communications and Media Au-

thority, 2011). This collaborative model can harness industry expertise while ensuring alignment with public policy objectives (Australian Communications and Media Authority, 2011). The GDPR, as analyzed by Walker (2022) and Cheng (2020), exemplifies co-regulation, with industry-developed codes of conduct subject to oversight by the Information Commissioner's Office.

Further, alternative regulatory approaches for Web3 in Kenya could be adapting existing legal frameworks, such as reclassifying security tokens as securities under the CMA Act, or developing novel regulatory regimes, similar to the EU's Markets in Crypto Assets (MiCA) regulation.

A. Self-regulation approach

Self-regulation presents a compelling solution to address the unique challenges and capitalize on the opportunities within the Web3 industry (Angotti, 2023; Ministry of ICT Blockchain Task Force, 2019). Self-regulation can enhance confidence and legitimacy within the dynamic Web3 landscape by enabling industry participants to voluntarily establish and enforce their own standards and guidelines (Finance Magnates Contributors, 2023). This approach can promote transparency and accountability among industry participants, alleviating concerns among consumers and investors regarding the inherent risks associated with cryptocurrencies (Finance Magnates Contributors, 2023).

Moreover, self-regulation has the potential to fill regulatory gaps that may exist within Kenya's governmental frameworks (Angotti, 2023). Given the novelty and rapid evolution of Web3, Kenya may lack the expertise or resources necessary to effectively regulate this rapidly evolving sector (Finance Magnates Contributors, 2023). Self-regulatory entities can step in to develop industry best practices and guidelines, laying the groundwork for future government regulation while ensuring industry growth is not affected by regulatory uncertainty (Angotti, 2023).

Self-regulation also enables the swift resolution of emerging issues within the Web3 industry (Finance Magnates Contributors, 2023). For example, as the Web3 ecosystem rapidly evolves with the emergence of novel technologies and financial instruments, self-regulatory organizations can swiftly adapt existing frameworks and formulate new standards. This proactive stance ensures expedient responses to evolving challenges, thereby preserving industry growth and stability (Finance Magnates Contributors, 2023).

Dostmohammad and Long (2015) observe that it is important to recognize that self-regulation does not equate to deregulation but a reallocation of regulatory responsibilities to parties other than the government. This approach underscores the importance of restoring confidence in the regulatory process and empowering industry stakeholders to actively participate in shaping the regulatory environment.

Also, Nabben (2023) posits that Web3's dual nature as a technological architecture and a sociopolitical ethos of self-organization allows participants to voluntarily engage with and disengage from its infrastructures based on personal convictions and inclinations, while also enabling them to actively shape the governing principles of their involvement. This unique characteristic of Web3 creates a compelling argument for integrating self-regulation within the industry. This approach is inherently consistent with the core tenets of Web3, which prioritizes decentralization, user autonomy, and community-driven governance (Nabben, 2023). Allowing industry stakeholders to develop and uphold their own rules and standards can enhance innovation and adaptability, accommodating the varied needs and preferences of the Web3 community (Nabben, 2023). Nabben (2023) further states that self-regulation can facilitate faster responses to technological advancements and market changes, maintaining the dynamism that is central to the ethos of Web3. Furthermore, self-regulation can complement government regulation, offering a cost-effective means of enforcement (Alston, 2023).

The Web3 industry's increasing adoption of self-regulatory frameworks is a testament to its alignment with Web3's decentralized ethos. These initiatives, aimed at establishing industry standards and best practices, advances collaboration, interoperability, and security. The EEA exemplifies this trend by focusing on the standardization of Ethereum for enterprise applications. Through the development of technical standards and best practices, the EEA has significantly enhanced Ethereum's interoperability, security, and scalability, thereby expanding its utility across diverse industries (Ethereum Enterprise Alliance, 2024; The Investopedia Team, 2024). Similarly, Hyperledger Foundation's commitment to open-source DLT development and collaboration has contributed significantly to the creation of a robust infrastructure for various industries. Hyperledger has advanced both technological capabilities and industry coordination, through promoting cross-industry adoption of DLT through open-source tools and standards (Hyperledger Foundation, 2024; Anthony Jnr et al., 2023). Collectively, these examples, demonstrate the crucial role of self-regulation in propelling Web3 maturity and mainstream acceptance by establishing stringent benchmarks for security, interoperability and innovation.

Blockchain, the core infrastructure of Web3, inherently incorporates self-regulatory elements, codifying compliance procedures to safeguard the integrity and security of the ecosystem. That is, 'the code itself acts as law to restrain activity' (Perani, 2018). This self-regulation is evident in various Blockchain networks, where rules and penalties for non-compliance are enforced through the technology itself. For example, the Bitcoin network uses encoded regulatory processes through cryptographic measures and the Proof-of-Work (PoW) consensus mechanism, to prevent malicious actors from compromising the integrity of the system (Deb et al., 2024). On the other hand, Ethereum employs a slashing mechanism to penalize validators who engage in harmful behavior (Deb et al., 2024; Olive & Jagdev, 2024). Also, diverse consensus mechanisms present differing incentives

to participants. For instance, Bitcoin employs financial rewards, while systems like Delegated Proof of Stake (DPoS) and Delegated Proof of Reputation offer reputational incentives (Do et al., 2019). Within this framework, Blockchain serves as a tool to achieve a crucial regulatory objective by modifying organizational behavior to promote user participation and compliance (McEntaggart et al., 2019).

Further, the concept of 'code is law' embraced by Bitcoin communities underscores the critical role of immutable software code in enforcing system rules (De Filippi & Hassan, 2018; Nabben, 2023). This decentralized approach empowers participants to adhere to and enforce regulations without needing centralized oversight. Blockchain technology then essentially ensures compliance through its transparent and auditable design, enhancing a self-regulatory environment (Nabben, 2023).

Smart contracts further enhance the self-regulatory framework within the Web3 industry. To illustrate this, smart contracts can monitor adherence to regulatory requirements and automatically impose penalties or corrective measures for minor infractions (Buchwald, 2020). In cases of serious breaches, smart contracts can trigger predefined consequences, such as freezing digital assets or initiating dispute resolution mechanisms (Buchwald, 2020). However, smart contracts are limited in resolving situations open to interpretation by the parties involved. Nevertheless, decentralized dispute resolution mechanisms, or 'digital courts' like Aragon Court, Kleros, and Jur, serve as self-regulatory enforcement mechanisms. These platforms, supported by Blockchain technology, settle disputes by crowdsourcing jurors who are economically incentivized to deliver fair rulings (Aouidef et al., 2021). The procedures on these platforms are also encoded as smart contracts, ensuring legal certainty (Aouidef et al., 2021).

1. Limitations to Self-Regulation

While self-regulation may appear to be an appealing approach to governing the Web3 industry, it faces significant challenges and limitations that make it ineffective as a comprehensive regulatory strategy. The decentralized nature of Web3, particularly within the cryptocurrency sector, presents unique risks that self-regulation cannot adequately address (Finance Magnates Contributors, 2023). Cryptocurrencies, which operate without backing from governments or financial institutions, lack the traditional safeguards provided by regulatory oversight (Finance Magnates Contributors, 2023).

One major concern with self-regulation in the cryptocurrency industry is the prevalence of fraud and scams such as the OneCoin scam, which, although falsely marketed as a cryptocurrency, was a Ponzi scheme (Finance Magnates Contributors, 2023). Its promoters falsely equated it to Bitcoin, despite lacking any legitimate Blockchain infrastructure. Prior to the arrest of its executives, the scheme amassed over four billion US Dollars from a global investor base through a fraudulent pyramid structure that victimized millions of people (Baruch, 2024).

The irreversible nature of cryptocurrency transactions also makes them attractive targets for malicious actors seeking to exploit system vulnerabilities, leading to substantial financial losses and harming the industry's reputation (Finance Magnates Contributors, 2023). Additionally, self-regulation often falls short of ensuring consumer protection. Without regulatory requirements, cryptocurrency companies leave users vulnerable to data breaches, financial losses, and fraudulent activities. Moreover, self-regulation can inadvertently facilitate market manipulation (Bains et al., 2022). Preeminent players in the cryptocurrency market possess the potential to exploit their market dominance through price manipulation, thereby creating an unfavorable competitive landscape for smaller participants (Finance Magnates Contributors, 2023). The absence of robust regulatory oversight exacerbates the industry's vulnerability to

price manipulation and other illicit activities, eroding market integrity and investor trust (Finance Magnates Contributors, 2023). This leads us to consider a perhaps more suitable regulatory approach, co-regulation.

B. The Co-regulation approach

Due to the limitations of the self-regulatory approach as discussed above, Kenyan regulators might further consider adopting a co-regulation model for Web3. Co-regulation is a hybrid approach that combines industry regulation with government oversight (Australian Communications and Media Authority, 2011). In co-regulation, both the industry and the government work together to create, manage, and enforce regulatory solutions. This collaboration often involves developing regulatory frameworks like codes of practice. Although the industry may oversee the administration of these frameworks, the government supports them with legislative backing to ensure their enforcement (Australian Communications and Media Authority, 2011).

Co-regulation offers a middle ground between state control and self-regulation by distributing responsibilities between state and non-state actors. These non-state actors include businesses, industry associations, experts, and the civil society (Australian Communications and Media Authority, 2011). Co-regulation involves collaboration in the creation, adoption, application, enforcement, and evolution of policies and regulations, ensuring that no single institution controls the entire regulatory process. Instead, it is a continuous, experimental, and adaptive process characterized by constant feedback and dialogue between the involved parties (Australian Communications and Media Authority, 2011).

Switzerland, particularly the canton of Zug, has emerged as a global hub for Blockchain innovation through the co-regulatory model (Crypto Valley, 2024). Switzerland's regulatory authority, active in the global Blockchain sector since 2015, has

collaborated closely with Blockchain companies to create a legal framework that balances innovation with essential oversight, including AML and Know-Your-Customer (KYC) compliance (Editorial Office CVJ.Ch, 2023; Mersetzky, 2023). As a result, Zug has attracted significant investment and talent, setting a global standard for other jurisdictions like Kenya (Editorial Office CVJ. Ch, 2023).

Malta is another example that has distinguished itself as a leading jurisdiction in Blockchain regulation, by implementing a co-regulatory approach that integrates government oversight with industry collaboration. As the first nation to establish a comprehensive legal framework for Blockchain, cryptocurrency, and DLT in 2018, Malta recognized the importance of regulatory clarity to encourage innovation (Abraham, 2019; Albers, 2023). According to Samuel Abraham (2019), the Malta Digital Innovation Authority (MDIA) serves as a cornerstone of this co-regulatory model, facilitating industry-government cooperation and ensuring rigorous standards for DLT platforms (Abraham, 2019). This symbiotic relationship has cultivated a flourishing Blockchain ecosystem, exemplified by Malta's status as a 'Blockchain Island' and its attraction to leading industry players. Malta's regulatory framework provides a potential blueprint for Kenya in balancing innovation with regulatory oversight (Albers, 2023).

1. Benefits of Co-regulation

The advantages of co-regulation are particularly relevant to Kenya's digital economy. Firstly, co-regulation could address the problem of information asymmetry between governmental and non-governmental actors. This is because the state, in itself, often lacks the data necessary to establish and maintain a regulatory climate that supports innovation while safeguarding the public interest (Aprilianti & Dina, 2021). Secondly, co-regulation can facilitate the flexible adaptation to legislative solutions in Kenya's rapidly changing digital economy. Technological advancements can happen instantly, necessitating immediate

changes to business models. Regulators must adapt quickly to sustain and facilitate innovation (Aprilianti & Dina, 2021). Lastly, Aprilianti & Dina (2021) suggest that co-regulation optimizes regulatory enforcement by distributing responsibilities between government and industry. The government establishes overarching principles while businesses develop specific codes of conduct, thereby enhancing regulatory efficacy.

Furthermore, co-regulation offers additional benefits. They include enhanced flexibility, potential cost reductions in compliance and administration, effective utilization of industry expertise to address sector-specific and consumer concerns, and expedited, low-cost complaint and dispute resolution mechanisms (Australian Communications and Media Authority, 2011).

2. Tools to Support Co-Regulation

Evidently, regulating Web3 through co-regulation presents a promising framework for Kenyan regulators to navigate its complexities. This collaborative approach utilizes various tools, such as public-private dialogue (PPD), to ensure that innovation is nurtured while maintaining solid protections for users. These tools enable a dynamic and adaptive regulatory landscape that is crucial for the effective governance of Web3 technologies. As will be discussed below, these mechanisms are vital in navigating the challenges and opportunities presented by Web3.

i) Public-Private Dialogue (PPD)

Aprilianti and Dina (2021) advocate public-private dialogue (PPD) as an essential tool for co-regulation, as it promotes effective engagement and dialogue between the government and private sector.

For Kenya, PPD mechanisms could offer structured and inclusive consultations, allowing both the government and private sector to actively participate in decision-making processes (Aprilianti & Dina, 2021; Herzberg & Wright, 2006). The benefits

of PPD include expediting and supporting reforms, which have the potential to improve Kenya's investment and development environment. It enhances policy design through a comprehensive problem diagnosis, leading to more effective implementation of policy reforms (Aprilianti & Dina, 2021; Herzberg & Wright, 2006). PPD can empower Web3 entrepreneurs to support regulatory reform by providing transparency and insight into governmental intent. This collaborative approach has the potential to promote good governance, mutual understanding and accountability, setting a standard of openness and cost-benefit analysis that can permeate both public and private sectors (Herzberg & Wright, 2006). Moreover, it serves as a platform for the government to gather feedback and encourage participation from Web3 industry stakeholders, thereby improving policymaking and enforcement (Aprilianti & Dina, 2021).

However, as Herzberg and Wright (2006) observe, PPD is not without its challenges. If poorly implemented, it risks exacerbating existing power imbalances, potentially favoring the larger well-established firms over small and medium small and medium-sized enterprises (SMEs) and marginalizing regional voices. A lack of transparency or inclusivity may engender what Herzberg and Wright (2006) term 'rent-seeking behavior', undermining the legitimacy of the process. Moreover, unstructured or unfocused dialogue can devolve into just mere talk or discussions without actionable outcomes, leading to disillusionment and resistance to reform. In addition, inadequate coordination with existing regulatory bodies may lead to duplication, creating confusion and inefficiency for PPD participants (Herzberg & Wright, 2006).

For Kenya, the success of PPD as a regulatory mechanism will depend on a careful balance of inclusivity, transparency, and coordination to maximize its benefits and minimize potential drawbacks.

ii). The Regulatory Sandbox

Another co-regulatory tool is the regulatory sandbox. This is not a new concept as the CMA operates a regulatory sandbox program designed to provide a controlled environment for testing innovative financial products, services, and business models (CMA, 2024; Obura, 2024; Durham, 2023; Eggers et al., 2023). By characterization, regulatory sandboxes are tools that can serve as vital catalysts in encouraging innovation within Kenya's Web3 regulatory frameworks, providing a controlled yet active platform where innovation and compliance converge (Durham, 2023), a perspective also observed by the CMA's CEO Wyckliffe Shamiah (Obura, 2024). This symbiotic relationship between innovators and regulators not only mitigates risks for businesses but also empowers regulators with firsthand insights into emerging technologies, enabling them to craft more pragmatic and effective rules (Durham, 2023).

Participating in regulatory sandboxes could offer numerous advantages for Web3-based businesses. It enables real-world testing, allowing the businesses to anticipate and tackle challenges that may arise once their innovations hit the market. This experience enhances understanding of product viability and areas for improvement (ByteBao, 2023). Sandboxes provide constructive feedback from regulatory bodies (Durham, 2023), aiding businesses in aligning with industry standards and ensuring compliance. Furthermore, sandboxes have the potential to simplify the compliance journey by gradually introducing businesses to regulatory expectations, minimizing friction and ensuring smooth operations (ByteBao, 2023).

Mauritius is an exemplar of a pioneering jurisdiction using regulatory sandboxes to foster Blockchain innovation. According to the Ministry of ICT Blockchain Report, its Regulatory Sandbox License (RSL) framework enables experimentation within a controlled regulatory environment, making it a conducive ecosystem for Blockchain ventures (Ministry of ICT Blockchain

Task Force, 2019; Africa Observatory on Responsible Artificial Intelligence, 2023).

In Kenya, the CMA has in the past experienced challenges in the admission of Web3-based businesses, particularly those involved in cryptocurrency services, as evidenced in the CMA Milestones Report of April 2021 (Bowmans, 2023). These challenges were mixed, including the novelty and complexity inherent in cryptocurrency technologies, which introduced a broad spectrum of risks and uncertainties not fully understood by the regulatory body. Compounding this was a pronounced gap in internal expertise necessary to assess these emerging technologies thoroughly (Bowmans, 2023). Additionally, the CMA faced substantial external resistance, notably from banking institutions that voiced strong objections to cryptocurrencies, as well as concerns over the potential impact of volatility on the stability of the local currency (Bowmans, 2023). Despite these challenges, in May 2024, the CMA made significant progress in the admission of Alphabloq Technologies Limited, a Blockchain-enabled real estate tokenization platform, into its regulatory sandbox (Mwangi, 2024). It is important to note that CMA admitted a company that appears to be primarily concerned with Blockchain's decentralized applications, such as the tokenization of real-world assets. Alphabloq's admission by CMA, therefore, lies in the broader implications of Web3 beyond cryptocurrency.

iii). Decentralized Autonomous Organizations (DAOs)

Another novel and promising co-regulatory tool that Kenyan regulators can implement, is a decentralized organizational structure, like a DAO. Regulators can proactively utilize them to optimize regulatory processes within the Web3 ecosystem. Facilitating collaborative strategies between state and non-state actors, DAOs have the potential to enhance information sharing, streamline enforcement procedures, and support the adaptive evolution of regulation (US Government Accountability Office, 2016). This approach would also contribute to the de-

velopment of more effective and transparent regulatory frameworks.

The Kenyan regulatory landscape for Web3 is characterized by fragmentation, with regulatory authority dispersed across multiple agencies. This dispersal has engendered regulatory overlap, impeding effective oversight and precipitated inefficiencies in regulatory processes. Moreover, the lack of a unified approach results in inconsistent supervision of analogous Web3 industry participants and disparate levels of consumer protection (US Government Accountability Office, 2016). For example, the CBK has maintained its cautious stance. Unlike the CBK's restrictive stance, the CMA has demonstrated a slightly progressive approach, combining regulatory oversight through the CMA (Amendment) Bill, 2023, with support for innovation *via* its regulatory sandbox for Blockchain-based projects. The Kenya Revenue Authority's (KRA) primary focus is on taxation, while the ODPC emphasizes data privacy and protection, particularly concerning Blockchain platforms' handling of personal data (Ogonjo & Kitili, 2023; Njanja, 2023). These disparate regulatory approaches, coupled with inconsistent broader government policy on Blockchain and cryptocurrencies, create a complex regulatory landscape (Walubengo, 2024). Therefore, while this may be a futuristic and complex concept, DAOs present Kenyan regulators with an invaluable opportunity to engage directly with a real-world Web3 application, thereby advancing their understanding of this transformative technology.

DAOs can also advance a two-tiered co-regulation model that enhances regulatory collaboration and consistency (Clarendon, 2022). This dual approach has the potential to not only enhance Kenya's Web3 regulatory framework but also establish a foundation for adaptive and informed policymaking in the dynamic Web3 landscape. And if this approach is effectively implemented, it can establish Kenya as a pioneer in the implementation of cutting-edge Web3 technology in the regulation of Web3 itself. The first tier promotes inter-agency cooperation, for in-

stance, between CBK, CMA or KRA, ensuring that they operate with cohesion and integrity, guided by the intrinsic qualities of Web3 technologies-transparency, collaboration, and immutability (Clarendon, 2022; Khosravani, 2024). This approach discourages fragmented or siloed regulation and aligns regulatory practices with the decentralized and open nature of Web3. This tier could also offer an auditability and review framework, enabling periodic evaluations of regulatory measures between the regulators to identify and address inconsistencies or areas of confusion within their regulatory frameworks (World Economic Forum, 2020). Additionally, it can offer a platform for clear and consistent communication, where Kenya's various regulatory entities can articulate objectives, requirements, and implications of regulations through regular updates and transparent guidance (National Audit Office, 2021). Regulatory bodies may share insights amongst themselves on emerging challenges, potential pitfalls, and successful strategies, maintaining a current understanding of the Web3 landscape. This would enable policies to evolve cohesively in support of innovation while effectively managing risks (Mini et al., 2021).

The second tier would involve structured engagement between regulators and Web3 industry stakeholders, enabling a dynamic exchange of knowledge and perspectives. This second tier has the potential to provide a decentralized infrastructure that enables transparent and accessible regulatory processes for all stakeholders, including users, developers, and businesses (Mini et al., 2021). Consensus mechanisms are the processes used in the Blockchain to reach agreement for every participant (Yu Wu et al., 2022; Sultan et al., 2018), and they can ensure that regulatory decisions reflect diverse perspectives and interests. Additionally, the DAO can serve as a mechanism for holding regulators accountable for their actions, thereby preventing abuse of power and ensuring regulatory compliance (Mini et al., 2021).

While the proposed approach holds promise in theory, its practical implementation is fraught with substantial challeng-

es. The technical complexity of DAOs presents significant hurdles, both in terms of understanding and application, which may overwhelm existing regulatory capacities. For instance, regulatory challenges within the Web3 space are inherently complex, and the intricate decision-making processes required to address them cannot be fully encapsulated within the confines of smart contracts, which power DAOs (Mueller, 2022; Ballandies et al., 2024). Another significant limitation of the DAO co-regulation model is the considerable expenditure of resources required to maintain effective collaboration between industry stakeholders and regulatory authorities. This partnership can often be resource-intensive, as it demands sustained engagement, coordination, and monitoring from both sides (Balleisen & Eisner, 2009). Also, the expected results of such a co-regulatory framework will not always immediate.

Furthermore, there is a notable absence of a clear regulatory framework within the Kenyan legal system to guide the formation and governance of DAOs, further complicating the prospect of their integration into the regulatory landscape. Another potential limitation is the lack of consistent long-term support from industry stakeholders, whose interests may diverge or wane over time. Moreover, the Web3 space in Kenya is characterized by a division of ideologies and perspectives on regulation. Techno-libertarians advocate for minimal or no regulation (Bodo and Giannopoulou, 2019; Ragnedda and Destefanis, 2019), while others within the sector argue for the necessity of regulatory oversight to ensure industry stability and legitimacy. This ideological divide could hamper the formation of a unified framework for DAOs, potentially stalling any efforts to establish such a co-regulatory model in the Kenyan context.

iv). Standards

Standards serve as foundational elements within business operations, facilitating collaboration through interoperability, promoting safety and stimulating innovation (Weigmann et al.,

2017). They also contribute by mitigating information asymmetry among organizations, businesses, and consumers (Brown et al., 2022), and 'increasing trust' (Castka, 2020), thereby underpinning sectors within Web3 and beyond (Weigmann et al., 2017). Wiegmann, de Vries, and Blind (2017) outline three primary modes of standardization: committee-based, market-based, and government-based. While all three modes involve diverse stakeholders and strategic roles, committee-based and government-based standards are particularly relevant to this context. Committee-based standards emerge from collaborative efforts of industry groups or consortia such as the EEA, resulting in consensus-driven guidelines, for example, ISO standards. Government-based standards, on the other hand, are imposed through hierarchical power, often driven by political or societal objectives. Governments can either mandate the use of existing standards or develop their own (Weigmann et al., 2017).

In Kenya's evolving Web3 landscape, the implementation of standards could provide a competitive advantage by strengthening the country's digital sovereignty, a concept previously discussed (Brown et al., 2022). Moreover, industry standards can enable secure, reliable, and interoperable systems, which are essential for achieving global market acceptance and ensuring cross-border compatibility (Pfeifer, 2009).

A hybrid approach, blending committee-based and government-based standardization, is arguably the optimal model for navigating Kenya's dynamic Web3 landscape. An example of this particular approach is the TCP/IP, a widely used Internet protocol suite (IBM, 2024). This dual mode capitalizes on the technical expertise and consensus-driven processes of committee-based standardization, while governmental oversight ensures alignment with national priorities, such as economic development and security.

The hybrid model's merit lies in balancing regulatory authority and industry innovation. Regulators like CMA and CBK, can provide oversight, especially for Web3 sectors with systemic

implications, for instance financial services. However, the committee-based aspect invites key stakeholders—including tech firms, legal experts, and consumer protection advocates—to shape practical and adaptable standards, ensuring that emerging technologies remain responsive to industry needs and global trends (Weigmann et al., 2017).

Additionally, employing standards as a co-regulatory tool offers significant advantages for Kenya. First, standards enhance consumer protection and trust by setting minimum quality and security benchmarks, addressing the informational asymmetries often seen in Web3 (Weigmann et al., 2017; Brown et al., 2022). They also support innovation diffusion by enabling diverse firms to operate on interoperable systems, reducing entry barriers and encouraging local and international partnerships (Weigmann et al., 2017; Laraia, 2022). Standards facilitate regulatory agility rather than relying on rigid legislation. Standards allow for incremental adjustments as Web3 evolves, keeping pace with innovation while mitigating risks (Laraia, 2022). Standards are crucial for accelerating the adoption of Web3 technologies in Kenya, offering a pathway to streamlined and interoperable Web3 systems. The EEA underscores the value of standards, highlighting how they drove mass adoption of the Internet by establishing common protocols and technical frameworks that promoted accessibility and innovation (EEA, 2024). Similarly, in Kenya's Web3 landscape, standards can unify fragmented approaches, enabling smoother integration of decentralized ledgers, DeFi, and other Web3 innovations into the digital economy (Laraia, 2022; Brown et al., 2022).

A committee-driven, government-supported standardization approach presents an effective co-regulatory tool for Kenya to adopt in regulating the Web3 space. This model aligns with Web3's collaborative ethos while establishing a regulatory foundation suited to Kenya's unique landscape. This model also encourages multi-stakeholder participation, allowing industry experts, policymakers, and Web3 developers to contribute to

standards that uphold the decentralized and transparent nature of Web3 while ensuring regulatory compliance (Weigmann et al., 2017; Schuurman, 1997).

While this proposed regulatory model offers an innovative and promising approach to regulating the Web3 space in Kenya, it is important to acknowledge that this analysis or its practical implementation is largely theoretical due to the early stage of Web3 development within the country. The approach assumes an operational maturity and stakeholder engagement that is not yet fully realized in the country. As such, this model's feasibility is contingent upon Kenya's capacity to create a collaborative ecosystem among state and non-state actors (ITU, 2016), a complex undertaking in the absence of significant Web3 infrastructure or an established regulatory framework.

Kenya's regulatory authorities, such as the CMA, CBK, and ODPC, are well-positioned to play a central role in shaping the Web3 landscape. These agencies could develop, monitor, and enforce Web3 standards, contribute to the creation of new Web3-specific laws, or provide guidance on how existing regulations can be adapted to accommodate Web3 technologies. Given their existing mandates, which overlap with key aspects of Web3, such as financial services, data protection, and market integrity, these agencies have a strong foundation for a co-regulatory approach. However, to ensure effective regulation of Web3 technologies, these agencies must transcend their traditional mandates and collaborate closely (World Economic Forum, 2020). This is crucial to prevent regulatory duplicity or fragmentation, a challenge that has plagued other sectors, such as banking and financial services, as noted by Ndalo (2017). Alternatively, a specialized task force or interagency committee could be formed to coordinate their efforts in addressing overlapping jurisdictional issues in this space.

Furthermore, the co-regulatory framework would rely heavily on the active participation and goodwill of non-state actors, including industry associations, tech firms, and civil society or-

ganizations. For example, organizations such as the Blockchain Association of Kenya (BAK) and Virtual Assets Chamber of Commerce, could provide sector-specific insights, while tech firms developing Web3 solutions could assist in drafting and testing regulatory standards. Engaging civil society and consumer protection groups like Consumers Federation of Kenya (Cofek) would add depth to the regulatory process by focusing on user protection and public interest concerns (Ndalo, 2017), thus encouraging trust and transparency. Likewise, as discussed above, PPD and regulatory sandboxes could serve as valuable tools, but their successful implementation hinges on continuous support from both government and industry stakeholders (Aprilianti & Dina, 2021; Durham, 2023). Given Kenya's current level of Web3 development, achieving a balanced co-regulatory environment would thus require considerable capacity-building and alignment of interests, with a genuine commitment to promoting both innovation and regulatory compliance (Armstrong, et al., 2020). With the right tools, infrastructure, and collaborative will, this notional framework could eventually transition into a practical model for Kenya's Web3 ecosystem.

C. Adapting existing regulatory frameworks or developing new regulations?

1. Adapting existing regulatory frameworks

The regulatory framework for Web3 technologies in Kenya can be adeptly integrated with existing legislation to promote both innovation and compliance. Some of the key statutes and their relevant applications are outlined below.

The Central Bank of Kenya Act (*Chapter 491 of the Laws of Kenya*) establishes the regulatory framework for financial institutions and can be extended to include cryptocurrency exchanges and digital financial services (Central Bank of Kenya). The CBK has issued cautionary statements or guidelines on digital currencies, reflecting its role in regulating the digital financial sector.

For instance, cryptocurrency exchanges like Binance and digital payment gateways such as Kotani Pay could fall under this Act, ensuring their operations are monitored for financial stability and compliance (Freeman Law, 2023).

The National Payment System Act (NPSA), 2011 empowers the CBK to oversee payment systems and service providers, including mobile operators. This Act is applicable to digital payment platforms within the Web3 ecosystem, such as those facilitating cryptocurrency transactions and token transfers. For example, platforms like PayPal's cryptocurrency service could be regulated under the NPSA to ensure secure and compliant operations (Freeman Law, 2023; PayPal, 2024).

The Capital Markets Act (*Chapter 491 of the Laws of Kenya*) regulates securities and investment markets and could be adapted to include security tokens and Initial Coin Offerings (ICOs). By applying this Act, Kenya can ensure compliance with securities regulations and protect investors in Web3 activities. For instance, ICOs and Exchange-Traded Products (ETPs) based on Blockchain technology can be governed under this framework (Andersen, 2024), promoting transparency and investor protection.

The Companies Act, 2015 governs the formation and operation of companies. This Act can be applied to decentralized organizational structures such as DAOs. This approach can enhance corporate governance and accountability within the Web3 ecosystem (Rikken et al., 2023).

The Data Protection Act, 2019 regulates the collection, processing, and storage of personal data (ODPC, 2024). It is crucial for Web3 applications handling personal information, such as decentralized applications (dApps) that process user data on Blockchain networks. Compliance with this Act ensures that user privacy is protected, and data is managed responsibly (Milosevic & Savic, 2023).

The Anti-Money Laundering and Combating of Terrorism Financing Laws (Amendment) Act, 2023 aims to prevent money laundering and terrorist financing. It is particularly relevant for Web3 technologies, including cryptocurrencies, to ensure that they are not misused for illicit activities. The Act can be applied to platforms dealing with digital currencies to prevent financial crimes (Chainalysis Team, 2023).

The Consumer Protection Act, 2012 guarantees consumer rights and can be extended to digital goods and services within the Web3 ecosystem. It can ensure fair treatment and provide mechanisms for redress in cases of disputes related to Web3 products and services (Oraro & Barasa, 2018; The Competition Authority of Kenya, 2017).

Intellectual Property Laws, particularly The Copyright Act, 2001, can safeguard intellectual property related to Blockchain innovations such as NFTs. These laws can ensure that creators and developers in the Web3 space have their rights protected (Lobanov, 2022). Additionally, the Law of Contract (*Chapter 23 of the Laws of Kenya*) can provide a foundation for governing agreements in the Web3 space, particularly smart contracts (Stuart et al., 2018).

2. Establishing new regulations

An alternative strategy for Kenya would involve the creation of novel and encompassing regulatory frameworks to accommodate the rapidly evolving Web3 ecosystem. Drawing inspiration from international precedents such as the U.S. Lummis-Gillibrand Responsible Financial Innovation Act (Gillibrand, 2023) and Payment Stablecoin Act (Gillibrand, 2024), and the EU's Markets in Crypto-Assets (MiCA) Regulation, Kenya could establish a regulatory environment that effectively balances consumer protection with the promotion of innovation. As Senator Lummis aptly noted, the crypto asset landscape is characterized by constant flux, necessitating adaptive legislation to maintain equilibrium between these critical objectives (Gillibrand, 2023).

Kenya has also made a concerted effort to regulate a segment of the Web3 space through the introduction of the Kenya Virtual Asset Service Providers (VASP) Bill 2024. The Bill includes several key provisions aimed at regulating the country's emerging digital asset market (Oraro & Co., 2024; BitKe, 2024). One of its central features is the establishment of a licensing regime for virtual asset products and service providers, alongside mechanisms for the registration of promoters involved in ICOs and NFTs. The bill seeks to ensure consumer protection through comprehensive regulatory oversight, which is expected to help attract foreign direct investment by offering a stable and secure environment for virtual asset transactions (BitKe, 2024). In addition to the licensing requirements, the bill addresses compliance aspects, detailing procedures for evaluating and enforcing administrative sanctions in cases of non-compliance (Oraro & Co., 2024; BitKe, 2024). Despite receiving feedback from stakeholders, the bill has not yet progressed, possibly due to the sector's inherent complexity and the cautious, 'wait-and-see' approach adopted by regulators as they seek to balance innovation with regulatory clarity in an evolving space.

3. A hybrid approach?

Given the intricate and transitory nature of Web3 technologies, this paper also advocates for the adoption of a hybrid approach by Kenyan regulators in the formulation of a regulatory framework. This approach should balance the adaptation of existing regulatory frameworks with the development of entirely new laws where necessary. Such a strategy will ensure that the legal landscape remains both responsive to the fast-paced innovation inherent in the Web3 space and aligned with Kenya's broader regulatory and economic objectives.

First, entirely new laws should be introduced where existing regulatory frameworks are inadequate or silent on specific technologies inherent to Web3. This is particularly relevant in areas where the application of current legislation may not fully

address the subtleties of DeFi, NFTs, or DAOs. In such a case, regulators and industry stakeholders could consider reinvigorating discussions surrounding the VASP Bill. These laws would be specifically tailored to the Web3 ecosystem, addressing the unique challenges and opportunities presented by these emerging technologies. At the same time, it would be shortsighted to disregard the existing body of legislation that could be adapted to regulate parts of the Web3 space. Notably, Kenya has several statutes that can be extended or amended to encompass Web3 activities without the need for entirely new legislation.

In adopting a hybrid approach, it is crucial that regulators avoid creating a regulatory burden that stifles innovation. Instead, the amendments and adaptations of existing laws should focus on enhancing their versatility, and ensuring they are streamlined enough to accommodate the convergence of Web3 technologies with other emerging fields such as artificial intelligence (AI) or spatial computing (WEF, 2023). This will require a flexible regulatory framework capable of evolving in parallel with technological advancements, while safeguarding critical interests such as consumer protection, financial stability, and data security.

The key to success in this approach lies in maintaining a careful balance. Regulators must be proactive in addressing gaps in the current regulatory regime, introducing new laws where existing frameworks are insufficient. However, they must also ensure that the integration of Web3 technologies into the existing legal system does not lead to regulatory fragmentation or unnecessary complexity. Harmonizing and modernizing existing legal frameworks, can allow Kenya to establish an adaptive regulatory environment that supports innovation while ensuring that emerging technologies, such as Web3, can evolve within a secure and well-regulated context. .

V. CONCLUSION

The rapid evolution of Web3 technologies, comprising crypto-assets, smart contracts, DeFi, NFTs, and DAOs, presents a complex interplay of opportunities and regulatory challenges. Kenya's strategic integration of advanced digital frameworks into its economic and social fabric necessitates a delicate regulatory approach that simultaneously encourages innovation, and safeguards consumers and market integrity.

However, the conclusions presented in this paper inevitably raise a number of further, more specific questions, which illustrate the complexity of regulating Web3. The questions that emerge are, how should Kenya approach the regulation of Web3? Should regulatory efforts be complemented by exogenous factors, such as the development of standards or the adaptation of existing frameworks, or should they align with the endogenous, self-regulatory characteristics of Web3, qualities inherent in technologies like Blockchain, such as consensus mechanisms? To what extent can collaboration between state and non-state actors contribute to the establishment of a stable regulatory framework, and how can we ensure that all stakeholders possess the requisite goodwill and commitment to engage meaningfully in co-regulation? Should regulatory efforts be comprehensive, addressing the entirety of Web3, or should they focus exclusively on its financial components, such as DeFi, NFTs, and cryptocurrencies?

The answers to these questions will undoubtedly contrast, necessitating thoughtful examination by scholars, regulators, and Web3 industry stakeholders. Rather than prescribing a definitive blueprint for regulating Web3 in Kenya, this paper recommends an investigative framework, a foundation of broad principles and essential questions, to support regulators and industry actors in rigorously evaluating various regulatory strategies. Among these strategies is the co-regulation model canvassed above, which could encourage collaboration in developing standards, and a hybrid approach that reconciles existing

laws with new regulatory measures tailored to Web3's unique demands. In essence, this paper advocates for a more systematic and integrated approach, encouraging stakeholders to weave these efforts into a cohesive, cooperative regulatory architecture.

Ultimately, the regulatory approach Kenya adopts must strike a balance, encouraging innovation while managing the risks inherent in Web3 technologies. As fittingly articulated by the Blockchain Task Force, 'Regulation is inevitable; therefore, regulate but not prohibit' (Ministry of ICT Blockchain Task Force, 2019). Through these efforts, Kenya can emerge as a global leader in digital governance, providing a model for other nations grappling with the complexities of Web3 regulation.

REFERENCES

Abraham, S. (2019). How Malta became the block chain island. International Finance. *International Finance*. https://internationalfinance.com/magazine/fintech-magazine/how-malta-became-the-blockchain-island/

Abuya, K. (2024). Crypt o exchanges spared from taxes as Kenya court nullifies 2023 Finance Bill. TechCabal. https://techcabal.com/2024/08/01/crypto-exchanges-spared-from-taxes-in-kenya/

Adejumo, O. (2024). Nigerian Bitcoin advocate challenges government restrictions in landmark lawsuit. *CryptoSlate*. https://cryptoslate.com/nigerian-bitcoin-advocate-challenges-government-restrictions-in-landmark-lawsuit/

Adeyemo, S. (2023). Blockchain Association of Kenya drags government to court over crypto tax. *Mariblock*. https://www.mariblock.com/blockchain-association-of-kenya-drags-government-to-court-over-digital-assets-tax/

Adrian, T. (2024). The Changing Landscape of Crypto Assets—Considerations for Regulatory and Supervisory Authorities, IMF-FSB-OCC Crypto Conference. https://www.imf.org/en/News/Articles/2024/02/23/sp022324-changing-landscape-crypto-assets-considerations-regulatory-and-supervisory-authorities

Africa Observatory on Responsible Artificial Intelligence. (2023). Sandboxes in Mauritius. *Africa Observatory on Responsible Artificial Intelligence* https://www.africanobservatory.ai/social/sandboxes-in-mauritius

Aggarwal, S. & Kumar, N. (2021). Cryptocurrencies. Advances in Computers, *Science Direct 121* (1), 227-266. https://doi.org/10.1016/bs.adcom.2020.08.012

Al Jazeera. (2015). Egypt adopts controversial anti-terrorism law. *Al Jazeera* https://www.aljazeera.com/news/2015/8/17/egypt-adopts-controversial-anti-terrorism-law

Albers, K. D. (2023). How Malta became a global staple for the crypto industry. *Times Malta*. https://timesofmalta.com/article/malta-global-staple-crypto-industry-a2.1015140

Algorand Foundation. (2024). What are smart contracts? *Algorand Foundation News*. https://algorand.co/learn/what-are-smart-contracts

Almadani, S. (2023). Promoting Fair Market Practices and Combating Monopoly. https://www.linkedin.com/pulse/promoting-fair-market-practices-combating-monopoly-sharif-almadani

ALN. (2022). Cryptocurrency boom in Africa: What is next for Kenya? *ALN Legal Alert.* https://aln.africa/wp-content/uploads/2022/04/ALN-Kenya-Legal-Alert-The-Cryptocurrency-Boom-in-Africa-What-is-Next-for-Kenya.pdf

Alston, E. (2023). Digital currency industry self-regulation: Not all consensus is automatic. *Law & Economics Center at George Mason University Scalia Law School Research Paper Series No. 22-038*. https://ssrn.com/abstract=4207082 or http://dx.doi.org/10.2139/ssrn.4207082

Ambani, B. (2023). Tax pain as Kenyans to pay 3pc on sale of digital assets. *Nation*. https://nation.africa/kenya/business/tax-pain-as-kenyans-to-pay-3pc-on-sale-of-digital-assets-4353210

Andersen, D. (2024). Valour to launch digital asset ETPs in Kenya. *Cointelegraph*. https://cointelegraph.com/news/valour-launches-digital-asset-etps-nairobi-securities-exchange

Angotti, A., Angulo, T., Bolton, G., & Kusz, G. (2023). The case for self-regulation for the digital assets industry. *Journal of Financial Compliance* 7(1), 15-34. https://guidehouse.com/-/media/new-library/industries/financial-services/documents/2023/the-case-for-self-regulation-for-digital-assets-industry-guidehouse-jfcv7n1.ashx

Anthony Jnr, B., Sylva, W., Watat, J. K., & Misra, S. (2023). A framework for standardization of distributed ledger technologies for interoperable data integration and alignment in sustainable smart cities. *Journal of the Knowledge Economy*. *15* (1), 12053-12096. https://doi.org/10.1007/s13132-023-01554-9

Aouidef, Y., Ast, F., & Deffains, B. (2021). Decentralized justice: A comparative analysis of blockchain online dispute resolution projects. *Frontiers in Blockchain*. https://www.frontiersin.org/journals/blockchain/articles/10.3389/fbloc.2021.564551/full

Aprilianti, I., & Dina, S. A. (2021). Co-regulating the Indonesian digital economy. *Centre for Indonesian Policy Studies (CIPS*) *Policy Paper Series No. 30*. https://repository.cips-indonesia.org/media/publications/332998-co-regulating-the-indonesian-digital-eco-30376717.pdf

Armstrong, H., Bárd I., Engström, E. (2020). Regulator approaches to facilitate, support and enable innovation. *Department for Business, Energy and Industry Strategy*. https://assets.publishing.service.gov.uk/media/5e2efd76ed915d1f26a7427f/regulator-approaches-facilitate-support-enable-innovation.pdf

Atzori, M. (2017). Blockchain technology and decentralized governance: Is the state still necessary? *Journal of Governance and Regulation,* 6 (1), 45-62. http://dx.doi.org/10.22495/jgr_v6_i1_p5

Australian Communications and Media Authority. (2011). Optimal conditions for effective self- and co-regulatory arrangements. *Australian Communications and Media Authority (ACMA) Occasional paper*. https://www.acma.gov.au/sites/default/files/2019-08/Optimal%20conditions%20for%20self-%20and%20co-regulation%20Sep%202011%20pdf.pdf

Aven, T. (2016). Risk assessment and risk management: Review of recent advances on their foundation. *European Journal of Operational Research*, 253(1), 1-13. https://doi.org/10.1016/j.ejor.2015.12.023

Bains, P., Ismail, A., Melo, F., & Sugimoto, N. (2022). Regulating the crypto ecosystem: The case of unbacked crypto assets. *International Monetary Fund (IMF)* https://www.imf.org/en/Publications/fintech-notes/Issues/2022/09/26/Regulating-the-Crypto-Ecosystem-The-Case-of-Unbacked-Crypto-Assets-523715

Bakare, F., Omojola, J. & Iwuh, A. (2024). Blockchain and decentralized finance (DEFI): Disrupting traditional banking and financial systems. *World Journal of Advanced Research and Reviews. 23*(1), 3075-3089 doi.org/10.30574/wjarr.2024.23.3.2968.

Ballandies, M. C., Carpentras, D. & Pournaras, E. (2024). DAOs of collective intelligence? Unraveling the complexity of blockchain governance in decentralized autonomous organizations. https://doi.org/10.48550/arXiv.2409.01823

Balleisen, E. J. & Eisner, M. (2009). The promise and pitfalls of co-regulation: How governments can draw on private governance for public purpose. *The Tobin Project*. https://tobinproject.org/sites/default/files/assets/New_Perspectives_Ch6_Balleisen_Eisner.pdf

Baruch, J. (2024). Cryptoqueen' Ruja Ignatova, mastermind of the OneCoin scam, was still investing in Dubai while under indictment. *Le Monde*. https://www.lemonde.fr/en/les-decodeurs/article/2024/05/28/cryptoqueen-ruja-ignatova-mastermind-of-the-onecoin-scam-was-still-investing-in-dubai-while-under-indictment_6672858_8.html

Bellavitis, C., Fisch, C. & Momtaz, P. (2022). The rise of decentralized autonomous organizations (DAOs): A first empirical glimpse. *Venture Capital* 25 (3) 1-17. http://dx.doi.org/10.1080/13691066.2022.2116797

Bells, B. (2024). 7 Reasons blockchain is the foundation of Web3: Powered by X Banking. *Medium*. https://medium.com/@benbells1234/7-reasons-blockchain-is-the-foundation-of-web3-powered-by-xbanking-386c94ace8e1

Bird & Bird. (2024). Markets in crypto-assets (MiCA) – New EU law on crypto-assets. *Bird & Bird* https://www.twobirds.com/en/insights/2024/global/markets-in-crypto-assets-new-eu-law-on-crypto-assets#:~:text=For%20some%20initial%20guidance%20on,parts%20from%2030%20December%202024

Bishop, M. (2024). What is regulation? Who regulates, how do they regulate, and how is regulation scrutinised? *Institute for Government* https://www.instituteforgovernment.org.uk/explainer/regulation

BitKe. (2024). Blockchain Association of Kenya. https://bitcoinke.io/wp-content/uploads/2024/05/VASP-Draft-Bill-Stamped-by-Clerk-National-Assembly.pdf

Blandin, A., Cloots, A. S., Hussain, H., Rauchs, M., Saleuddin, R., Allen, J. G., Zhang, B., & Cloud, K. (2020). Global Cryptoasset Regulatory Landscape Study. *Cambridge Centre for Alternative Finance.* https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf

Blundell, J. and Robinson, C. (2000). Regulation Without the State… the Debate Continues. *Institute of Economic Affairs*. https://iea.org.uk/publications/research/regulation-without-the-state-the-debate-continues

Bodo, B. & Giannopoulou, A. (2019). Blockchain: A disruptive technology. In Ragnedda M. & Destefanis, G. (Eds.), *Blockchain and Web 3.0: Social, economic, and technological challenges* (pp. 1-11) Routledge, Taylor & Francis Group.

Bowmans. (2023). *Africa Guide to cryptocurrencies*. https://bowmanslaw.com/wp-content/uploads/2023/03/Africa-Guide-Cryptocurrency-27.02.2023.pdf

Brinnen, M., & Westman, D. (2019). *What's wrong with the GDPR? Description of the challenges for business and some proposals for improvement.* https://www.svensktnaringsliv.se/material/skrivelser/xf8sub_whats-wrong-with-the-gdpr-webbpdf_1005076.html/What%27s+wrong+with+the+GDPR+Webb.pdf

Brown, N., Knee, P., & Blind, K. (2022). *The role of standardisation in support of emerging technologies in the UK: Final report*. https://assets.publishing.service.gov.uk/media/6297a1458fa8f50390d4500b/role-of-standardisation-in-support-of-emerging-technologies-uk.pdf

Bryant, K. (2024). Understanding Web3 and its impact on the internet and society. *Forbes*. https://www.forbes.com/sites/kalinabryant/2024/04/23/understanding-web3-and-its-impact-on-the-internet-and-society/

Buchwald, M. (2020). Smart contract dispute resolution: The inescapable flaws of blockchain-based arbitration. *University of Pennsylvania Law Review, 168*(5), 1369-1412. https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=9702&context=penn_law_review

ByteBao. (2023). Regulatory sandboxes: Fostering Web3 innovation and ensuring compliance. *LinkedIn*. https://www.linkedin.com/pulse/regulatory-sandboxes-fostering-web3-innovation-ensuring-compliance

Capital Markets Authority. (2023). https://www.cma.or.ke/regulatory-framework/#overview

Capital Markets Authority. (2024). Regulatory Sandbox. https://www.cma.or.ke/regulatory-sandbox/

Central Bank of Kenya. (2015). *Public notice caution to the public on virtual currencies such as Bitcoin*. https://www.centralbank.go.ke/images/docs/media/Public_Notice_on_virtual_currencies_such_as_Bitcoin.pdf

Central Bank of Kenya. (2018). *Public notice: Fraudulent financial services, products and applications*. https://www.centralbank.go.ke/uploads/press_releases/130503108_Public%20Notice%20-%20Fraudulent%20Financial%20Services%20Products%20and%20Applications.pdf

Central Bank of Kenya. (2022). *Discussion paper on central bank digital currency*. https://www.centralbank.go.ke/uploads/discussion_papers/CentralBankDigitalCurrency.pdf

Central Bank of Kenya. (2023). *Discussion paper on central bank digital currency: Comments from the public*. https://www.centralbank.go.ke/wp-content/uploads/2023/06/Discussion-Paper-on-Central-Bank-Digital-Currency-Comments-from-the-Public.pdf

Central Bank of Kenya. (n.d.) *Financial markets*. https://www.centralbank.go.ke/financial-markets/#:~:text=Within%20its%20financial%20markets%20role,manages%20the%20government's%20domestic%20debt.&text=Central%20Bank%20implements%20monetary%20policy,which%20include%20open%20market%20operations

Chain. (2023). The rise of crypto in developing nations — Why are countries with hyperinflation ditching the USD? *Medium*. https://medium.com/@chaincom/the-rise-of-crypto-in-developing-nations-why-are-countries-with-hyperinflation-ditching-the-usd-dcfecad83f86

Chainalysis Team. (2023). Cryptocurrency mining pools and money laundering: Two real world examples. *Chainalysis*. https://www.chainalysis.com/blog/cryptocurrency-mining-pools-money-laundering/

Cheng, H. (2020). The rise of co-regulation, from GDPR to Canada's Bill C-11. *IAPP*. https://iapp.org/news/a/the-rise-of-co-regulation-from-gdpr-to-canadas-bill-c-11

Chin Li Ting, C. (2022). 'Criteria for smart contracts in public procurement. *SIPMM*. https://publication.sipmm.edu.sg/criteria-smart-contracts-public-procurement/

Clarendon, M. (2022). Types of DAOs: New modes of collaboration. *Third Academy*. https://www.third.academy/article/types-of-daos-new-modes-of-collaboration

Coglianese, C. (2012). Regulation's four core components. *The Regulatory Review*. https://www.theregreview.org/2012/09/17/regulations-four-core-components/

Communications Authority of Kenya. (2023). Joint statement on operations of the Worldcoin in Kenya. https://www.ca.go.ke/ca-and-data-commissioner-warn-kenyans-over-worldcoin

Connor, C. & Sarkar, D. (2024). Benefits and limitations of Web3. arXiv. https://arxiv.org/html/2402.04897v1

Consensys.io. (2024). Blockchain use cases. Consensys. https://consensys.io/blockchain-use-cases

Crypto Valley. (2024). Why Switzerland? Crypto Valley. https://cryptovalley.swiss/why-switzerland/

Cumming, D. J., Johan, S., & Pant, A. (2019). Regulation of the crypto-economy: Managing risks, challenges, and regulatory uncertainty. *Journal of Risk and Financial Management, 12*(3), 126. https://doi.org/10.3390/jrfm12030126

De Filippi, P., & Hassan, S. (2018). Blockchain technology as a regulatory technology: From code is law to law is code. *SSRN*. https://ssrn.com/abstract=3097430\

De Filippi, P., & McMullen, G. (2018). *Governance of blockchain systems: Governance of and by distributed infrastructure*. Coalition of Automated Legal Applications. https://coala.global/wp-content/uploads/2019/02/BRI-COALA-Governance-of-Blockchains.pdf

De Filippi, P., Mannan, M., & Reijers, W. (2020). Blockchain as a confidence machine: The problem of trust & challenges of governance. *Technology in Society*, 62. https://doi.org/10.1016/j.techsoc.2020.101284

De, N. (2024). SEC committed 'gross abuse of power' in suit against crypto company, federal judge rules. *Coindesk*. https://www.coindesk.com/policy/2024/03/18/sec-committed-gross-abuse-of-power-in-suit-against-crypto-company-federal-judge-rules/

Deb, S., Raynor, R., & Kannan, S. (2024). Stakesure: Proof of stake mechanisms with strong cryptoeconomic safety. arXiv. https://arxiv.org/abs/2401.05797

DeVries, P. D. (2016). An analysis of cryptocurrency, bitcoin, and the future. *International Journal of Business Management and Commerce*, 1(2), September 2016. https://www.researchgate.net/publication/316656878_An_Analysis_of_Cryptocurrency_Bitcoin_and_the_Future

Digital Assets. (2023). Top DAOs projects in 2023. *CFTE Blog*. https://blog.cfte.education/top-daos-projects-2023/

Digital Dubai. (2022). Dubai Blockchain Strategy. https://www.digitaldubai.ae/initiatives/blockchain

Do, T., Nguyen, T., & Pham, H. (2019). Delegated proof of reputation: A novel blockchain consensus. arXiv. https://arxiv.org/pdf/1912.04065

Dostmohammad, S., & Long, J. (2015). *Regulating the sharing economy: Applying the process for creative destruction*. CAPPA. https://cappa.ca/wp-content/uploads/2017/06/DostmohammadLong_RegulatingtheSharingEconomy.pdf

Dr. Aksoy, P. (2024). *Regulation in the Web 3.0 Era: MiCA Regulation of the European Union*. ArkSigner Blog. https://blog.arksigner.com/en/regulation-in-the-web-3-0-era-mica-regulation-of-the-european-union#:~:text=One%20of%20the%20most%20important,are%20also%20among%20the%20objectives

Dr. Wiegmann, P. M. *Becoming the industry standard when standardisation is not standardised*. Rotterdam School of Management Erasmus University. https://www.rsm.nl/discovery/2019/industry-standard/

Durham, J. (2023). *Regulatory sandboxes enable pragmatic blockchain regulation. Washington Journal of Law, Technology & Arts, 18*(1), 2023. https://digitalcommons.law.uw.edu/cgi/viewcontent.cgi?article=1324&context=wjlta

Editorial Office CVJ.CH. (2023). *Government Council of Zug wants to support crypto research with CHF 39.35 million*. Crypto Valley Journal. https://cryptovalleyjournal.com/hot-topics/news/government-council-zug-support-crypto-research-40-million-chf/

EGBE. (2023). Ethical guidelines for blockchain systems. https://blockchain-observatory.ec.europa.eu/document/download/f74bb2b0-4524-4134-ab52-e25a0bcd9b7c_en?filename=Ethical_Guidelines_for_Blockchain_Systems.pdf

Eggers, W. D., Walsh, S. J., Joergensen, C., & Kishnani, P. (2023). *Regulation that enables innovation*. Deloitte Insights. https://www2.deloitte.com/us/en/insights/industry/public-sector/government-trends/2023/regulatory-agencies-and-innovation.html

Ekhator, O. (2024). *Kenyan lobby group takes the country's first-ever crypto bill to parliamen*t. Techpoint Africa. https://techpoint.africa/2024/02/07/blockchain-group-drafts-kenya-crypto-bill/

El-Khouri, M., & Schröder, C. (2023). *B3: Web3 fundamentals* [PDF]. https://www.bertelsmann-investments.com/fileadmin/files/B3_The_Hub/B3_Web3_Fundamentals.pdf

Emurgo Africa. (2023). The State of Web 3.0 in Africa. https://www.emurgo.africa/emurgo-africa-report-2023

Enterprise Ethereum Alliance. (2024). *Scaling the number of markets enterprise blockchain can address*. Enterprise Ethereum Alliance. https://entethalliance.org/wp-content/uploads/2020/02/LATEST-EEA_Trifold9-26-19.pdf

Enterprise Ethereum Alliance. (2024). The EEA is All About Possibilities. Enterprise Ethereum Alliance. https://entethalliance.org/

Esaam. (2022). *Anti-money laundering and counter-terrorist financing measures mutual evaluation report Kenya*. Financial Action Task Force (FATF). https://www.fatf-gafi.org/content/dam/fatf-gafi/translations/fsrb-mer/ESAAMLG-Mutual-Evaluation-Kenya-2022.pdf.coredownload.inline.pdf

Espinosa, V. I., & Pino, A. (2024). E-Government as a development strategy: The case of Estonia. *International Journal of Public Administration*, 1–14. https://doi.org/10.1080/01900692.2024.2316128

Ethereum. (2023). Welcome to Ethereum. Ethereum. https://ethereum.org/en/

EY. (2024). *Kenya Court of Appeal declares the Finance Act, 2023 unconstitutional one year later. Tax News Update: U.S. Edition*. https://taxnews.ey.com/news/2024-1498-kenya-court-of-appeal-declares-the-finance-act-2023-unconstitutional-one-year-later

FATF. (2019). Virtual assets and virtual asset service providers. *Financial Action Task Force*. https://www.fatf-gafi.org/content/dam/fatf-gafi/guidance/RBA-VA-VASPs.pdf

Fengler, W. (2012). How Kenya became a world leader for mobile money. *The World Bank Blogs*. https://blogs.worldbank.org/en/africacan/how-kenya-became-a-world-leader-for-mobile-money

Fetch.ai Ltd v Persons Unknown Category A & Ors [2021] EWHC 2254 (Comm). https://www.bailii.org/ew/cases/EWHC/Comm/2021/2254.html

Finance Magnates Contributors. (2023). *The role of self-regulation in the cryptocurrency industry: Where do we go from here?* https://www.financemagnates.com/cryptocurrency/regulation/the-role-of-self-regulation-in-the-cryptocurrency-industry-where-do-we-go-from-here/

Financial Stability Board. (2023). IMF-FSB Synthesis Paper: Policies for Crypto-Assets. 7 September 2023. https://www.fsb.org/uploads/R070923-1.pdf

Frankel, A. (2024). *Judge in Coinbase case endorses SEC's crypto regulation-by-enforcement strategy*. Reuters. https://www.reuters.com/legal/transactional/column-judge-coinbase-case-endorses-secs-crypto-regulation-by-enforcement-2024-03-27/#:~:text=The%20judge%20did%20dismiss%20SEC,the%20SEC's%20approach%20to%20cryptocurrency.%E2%80%9D

Freeman Law. (2023). *Kenya and cryptocurrency: Regulation of digital currencies, cryptocurrency, bitcoins, blockchain technology*. https://freemanlaw.com/cryptocurrency/kenya/

Frontier Technologies Hub. (n.d.). Framing the Future Exploring the potential of Web3 technologies to solve big global challenges. https://www.frontiertechhub.org/web3-symposium#:~:text=A%20symposium%20exploring%20the%20potential,the%20future%20potential%20of%20Web3

Gai, P., Kemp, M., Serrano, A. S., & Schnabel, I. (2019). *Regulatory complexity and the quest for robust regulation*. European Systemic Risk Board. https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190604_8_regulatorycomplexityquestrobustregulation~e63a7136c7.en.pdf

Gamaroff, L. (2024). Bitcoin in El Salvador: A total disaster or the future of money? https://www.linkedin.com/pulse/bitcoin-el-salvador-total-disaster-future-money-lorien-gamaroff-ziwpf#:~:text=The%20experience%20of%20adopting%20Bitcoin,volatility%20and%20uncertainties%20of%20cryptocurrency

Gan, W., Ye, Z., Wan, S., & Yu, P. S. (2023). *Web 3.0: The future of the internet*. arXiv. https://arxiv.org/abs/2304.06032

GBBC BITA Standards Council (BITA). (2004). *Global companies with a shared vision to leverage blockchain to define and grow open-source supply chain standards*. https://www.gbbc.io/bita-standards-council

Geral, D., Muthoni, I., & Kalule, B. (2018). Unscrambling blockchain: Regulatory frameworks in cryptocurrency. Bowmans https://bowmanslaw.com/wp-content/uploads/2018/09/Unscrambling-Blockchain_Session-1_Regulatory-Frameworks.pdf

Gillibrand, K. (2023). *Lummis, Gillibrand reintroduce comprehensive legislation to create regulatory framework for crypto assets*. Kirsten Gillibrand Press Release. https://www.gillibrand.senate.gov/news/press/release/lummis-gillibrand-reintroduce-comprehensive-legislation-to-create-regulatory-framework-for-crypto-assets/

Gillibrand, K. (2024). *Lummis, Gillibrand introduce bipartisan landmark legislation to create regulatory framework for stablecoins*. Kirsten Gillibrand Press Release. https://www.gillibrand.senate.gov/news/press/release/lummis-gillibrand-introduce-bipartisan-landmark-legislation-to-create-regulatory-framework-for-stablecoins/

Gitogo, W. (2020). Nurucoin Scam Mastermind Isaac Muthui Sought by Regulator. *Kenyan Wallstreet*. https://kenyanwallstreet.com/nurucoin-scam-mastermind-isaac-muthui-sought-by-regulator/

GL Solutions. (2024). *Top challenges facing state regulatory agencies in 2024*. GL Solutions https://glsolutions.com/regulatory-agency-software-blog/top-challenges-facing-state-regulatory-agencies-in-2024/#:~:text=Resource%20Constraints%20and%20Budget%20Limitations&text=State%20regulatory%20agencies%20often%20operate,conduct%20thorough%20inspections%20and%20investigations.

Gohil, K., Nightingale, P., & Kerai, P. (2024). *Innovation vs regulation - Web3*. TechUK. https://www.techuk.org/resource/innovation-vs-regulation-web3.html

Grant Thornton LLP. (2023). A review of the Kenya Finance Act, 2023. Grant Thornton Kenya. https://www.grantthornton.co.ke/globalassets/1.-member-firms/kenya/insights/pdf/finance-act-2023_analysis-by-grant-thornton.pdf

Habib, G., Sharma, S., Ibrahim, S., Ahmad, I., Qureshi, S., & Ishfaq, M. (2022). *Blockchain technology: Benefits, challenges, applications, and integration of blockchain technology with cloud computing*. *Future Internet, 14*(11), 341. https://www.mdpi.com/1999-5903/14/11/341

Hacker, P., Lianos, I., Dimitropoulos, G., & Eich, S. (2019). *Regulating blockchain: Techno-social and legal challenges—An introduction.* In P. Hacker, I. Lianos, G. Dimitropoulos, & S. Eich (Eds.)*, Regulating blockchain: Techno-social and legal challenges* (pp. 1-20). Oxford University Press. https://doi.org/10.1093/oso/9780198842187.003.0001

Hansen, P. (2021). Europe's third way is Web3: Why the EU should embrace crypto. Stanford Law School. https://law.stanford.edu/2021/11/12/europes-third-way-is-web3-why-the-eu-should-embrace-crypto/

Hedgeblock.io. (2024). *The evolution of blockchain from Bitcoin to Web3 and the rise of multisig wallets.* Medium. https://medium.com/@hedgeblockio/the-evolution-of-blockchain-from-bitcoin-to-web3-and-the-rise-of-multisig-wallets-4b4d4ddbe337

Herzberg, B. & Wright, A. (2006). *The PPD handbook: A toolkit for business environment reformers*. http://www.publicprivatedialogue.org/tools/PPDhandbook.pdf

HKTDC Research. (2024). *KENYA: New crypto tax bill approved by parliamentary committee*. HKTDC Research. https://research.hktdc.com/en/article/MTU4MTQ2NTk1MQ

Hyperledger Foundation. (2024). *Hyperledger Foundation.* https://www.hyperledger.org/

IBM. (2024). *Transmission Control Protocol/Internet Protocol*. https://www.ibm.com/docs/en/aix/7.2?topic=management-transmission-control-protocolinternet-protocol

ICAO (2022). *Overview of regulatory and industry developments in international air transport.* https://www.icao.int/Meetings/a41/Documents/Overview_of_Regulatory_and_Industry_Developments_in_International_Air_Transport.pdf

Islam, I., Munim, K. M., Oishwee, S. J., Islam, A. K. M. N., & Islam, M. N. (2020). A critical review of concepts, benefits, and pitfalls of blockchain technology using concept map. https://arxiv.org/abs/2004.08671 .

Issaias, A. (2021). Kenya: Understanding non-fungible tokens and related IP considerations. (Bowmans). https://bowmanslaw.com/insights/understanding-non-fungible-tokens-and-related-ip-considerations/

Jennings, S. (2023). Singapore's rise as Asia's fintech hub: A deep dive into fintech investment, crypto, and beyond. https://www.selbyjennings.sg/blog/2023/11/singapores-rise-as-asias-fintech-hub-a-deep-dive-into-fintech-investment-crypto-and-beyond

Joint Financial Sector Regulators Forum. (2022). Communique on the 13th Joint Financial Sector Regulators' Board Meeting. https://www.centralbank.go.ke/uploads/press_releases/834999694_Communique%20on%20the%2013th%20Joint%20Financial%20Sector%20Regulators'%20Board%20Meeting.pdf

Kalodimos, J. (2024). Financial disclosure under regulatory fragmentation. *SSRN*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4785824

Kamwana, K. (2024). Cryptocurrency scams in Kenya: How to identify and avoid them. *LinkedIn*. https://www.linkedin.com/pulse/cryptocurrency-scams-kenya-how-identify-avoid-them-kamau-kamwana-evtaf#:~:text=Top%20Cryptocurrency%20Scams%20in%20Kenya&text=In%202019%2C%20over%2011%2C000%20Kenyans,countless%20individuals%20in%20the%20process

Kane, E. J. (2005). Confronting divergent interests in cross-country regulatory arrangements. *National Bureau of Economic Research*. https://www.nber.org/papers/w11865

Kapoor, S. (2023). Case study: FTX and Sam Bankman-Fried. *Seven Pillars Institute*. https://sevenpillarsinstitute.org/case-study-ftx-and-sam-bankman-fried/

Kenya Insights Team. (2020). Cryptocurrency: Of Isaac Muthui's Nurucoin Sh2.7 billion scam. *Kenya Insights*. https://kenyainsights.com/cryptocurrency-of-isaac-muthuis-nurucoin-sh2-7-billion-scam/

Khalil, A. N. (2024). Bitcoin miner marathon partner with Kenya on renewable energy projects. *Forbes Digital Assets*. https://www.forbes.com/sites/digital-assets/2024/05/29/bitcoin-miner-marathon-partner-with-kenya-on-renewable-energy-projects/

Khosravani, P. (2024). DAO: Unleashing the power of human collaboration. *Intelligent HQ*. https://www.intelligenthq.com/dao-unleashing-the-power-of-human-collaboration/

Kivuva, M. (2024). Understanding digital taxation in Kenya: A pathway to fair and inclusive policy forms. *Kictanet*. https://www.kictanet.or.ke/understanding-digital-taxation-in-kenya-a-pathway-to-fair-and-inclusive-policy-reforms/#:~:text=In%202023%2C%20Kenya%20expanded%20its,-virtual%20currencies%20in%20Kenya's%20economy

Kostov, N., & Schechner, S. (2019). GDPR has been a boon for Google and Facebook: Europe's privacy laws have pushed advertisers to give business to the tech giants they trust. *The Wall Street Journal*. https://www.wsj.com/articles/gdpr-has-been-a-boon-for-google-and-facebook-11560789219

KRA. (2023). *Highlights of the Finance Act 2023*. https://kra.go.ke/154-finance-act-2023/1977-key-highlights-of-the-finance-act-2023

Krause, D. (2024). The rise of Web3: Opportunities and challenges. *SSRN*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4895353

Kuhn, D. (2024). The SEC can't stop suing crypto companies. *CoinDesk*. https://www.coindesk.com/opinion/2024/05/06/the-sec-cant-stop-suing-crypto-companies

Lai, Y., Yang, J., Liu, M., Li, Y., & Li, S. (2023). Web3: Exploring decentralized technologies and applications for the future of empowerment and ownership. *MDPI, 1*(2), 111-131. https://www.mdpi.com/2813-5288/1/2/8

Leech, O. (2021). What Is Uniswap? A complete beginner's guide. *CoinDesk*. https://www.coindesk.com/business/2021/02/04/what-is-uniswap-a-complete-beginners-guide/

Leewis, S., Smit, K., & van Meerten, J. (2021). An explorative dive into decision rights and governance of blockchain: A literature review and empirical study. *Journal of the Association for Information Systems, 13*(3), 25-56. https://doi.org/10.17705/1pais.13302

Lin, W. (2023). Key challenges of Web3. *ResearchGate*. https://www.researchgate.net/publication/370050127_Key_Challenges_of_Web3

Lobanov, L. (2024). Blockchain and intellectual property: Protecting creative assets. *Medium*. https://medium.com/@lea.lobanov/blockchain-and-intellectual-property-protecting-creative-assets-90c8656ac201#:~:text=-Blockchain%20can%20be%20used%20to,content%20remains%20secure-%20and%20protected.

Marchetti, S. (2023). Web3, blocksplained. *Bank of Italy. Occasional Paper No 717*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4462932

McEntaggart, K., Etienne, J., & Uddin, J. (2019). Designing self- and co-regulation initiatives: Evidence on best practices: A literature review. https://assets.publishing.service.gov.uk/media/5da9bd8be5274a5cac42150c/designing-self-co-regulation-initiatives.pdf

McKinsey & Company. (2023). What is Web3? *McKinsey & Company*. https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-web3

Meldrum, A. (2000). Mugabe land seizures force hundreds of farm owners to flee. *The Guardian*. https://www.theguardian.com/world/2000/jun/03/zimbabwe.andrewmeldrum

Mersetzky, M. (2023). Zug destined to become a blockchain research center. *Switzerland Global Enterprise*. https://www.s-ge.com/en/article/news/20232-blockchain-blockchain-research-center-canton-zug?ct

Metalex Legal. (2023). The need for standardized regulatory frameworks for Web 3.0: Security risks and challenges. *Metalex Legal* https://metalex-legal.com/publications/the-need-for-standardized-regulatory-frameworks-for-web-3.0:-security-risks-and-challenges

Michira, M. (2020). Police hunt for 'pastor' in Sh2.7b con game. *The Standard Media Group*.

Milosevic, I., & Savic, K. (2023). Blockchain and personal data protection. *Lexology*. https://www.lexology.com/library/detail.aspx?g=d-de2d588-9f51-4346-8a29-fe85c9898fbc

Mini, T., Ellinger, E. W., Gregory, R. W., & Widjaja, T. (2021). An exploration of governing via IT in decentralized autonomous organizations. *ResearchGate*. https://www.researchgate.net/publication/355483453_An_Exploration_of_Governing_via_IT_in_Decentralized_Autonomous_Organizations

Ministry of Information, Communications and Technology. (2019). *Emerging digital technologies for Kenya: Exploration & analysis.*

Mohammed Abdul, S. S. (2024). Navigating blockchain's twin challenges: Scalability and regulatory compliance. *MDPI, 2*(3), 265-298. https://www.mdpi.com/2813-5288/2/3/13

Momanyi, A., Mushizi, A., Wangio, D., Shukhe, D., Momanyi, E., Njonjo, F., Hajara, G. A., Kaindi, I., Macharia, I., Mutendeu, J., Mbai, M., Mbali, R. & Kabeney, S. (2020) Cryptocurrencies and blockchain: Critique to Central Bank of Kenya's public notice. *Daystar University*. https://repository.daystar.ac.ke/server/api/core/bitstreams/5206d393-d9cc-4733-aa39-d79abe81036b/content

Mueller, T. (2022). DAO series part 1: Why DAOs won't work (as they are today). 25 March 2022. *Medium*. https://thmueller.medium.com/why-daos-wont-work-and-what-we-can-do-to-change-that-8bffad170ce

Musser, R. (2015). Successful public-private dialogue: The Kenyan perspective. *Center for International Private Enterprise*. https://www.cipe.org/blog/2015/03/24/successful-public-private-dialogue-the-kenyan-perspective/

Mwamisi, C. (2024). Koskei lays down the law, demands regulatory agencies improve services. *The Star*. https://www.the-star.co.ke/siasa/2024-04-21-mwamisi-koskei-lays-down-the-law-demands-regulatory-agencies-improve-services/

Mwangi, K. (2023). Data Commissioner issues an advisory against Worldcoin. *Business Daily*. https://www.businessdailyafrica.com/bd/economy/data-commissioner-issues-an-advisory-against-worldcoin-4319146

Mwangi, K. (2023). Worldcoin returns to Kenya after police drop investigations. *Business Daily*. https://www.businessdailyafrica.com/bd/corporate/companies/worldcoin-returns-to-kenya-after-police-drop-investigations--4664218

Mwangi, K. (2024). CMA admits Alphabloq to test its real estate platform. *Business Daily*. https://www.businessdailyafrica.com/bd/markets/capital-markets/cma-admits-alphabloq-to-test-its-real-estate-platform--4618696

Mwaniki, B. K. (2017). Enhancing the fight against corruption in Kenya: Making the case for conferral of prosecutorial powers on the Ethics and Anti-Corruption Commission. *Strathmore University*. https://su-plus.strathmore.edu/items/fb25d5e8-725d-476e-9313-e122dd9ff061

Mwencha, P., Grace Githaiga, G., Kivuva, M. & Kapiyo, V. (2024) Digital taxation in Kenya Charting pathways towards fair, inclusive and sustainable policy reforms. *KICTANet*. https://www.kictanet.or.ke/

digital-taxation-in-kenya-charting-pathways-towards-fair-inclusivesustainable-policy-reforms/

Nabben, K. (2023). Web3 as 'self-infrastructuring': The challenge is how. *Social Media + Society*, *January-June 2023*. https://doi.org/10.1177/20539517231159002

Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. https://bitcoin.org/bitcoin.pdf

National Audit Office. (2021). *Principles of effective regulation: A summary guide for regulators and policymakers*. https://www.nao.org.uk/wp-content/uploads/2021/05/Principles-of-effective-regulation-interactive-accessible-Summary.pdf

National Bureau of Economic Research. (2022). El Salvador's experiment with Bitcoin as legal tender. (Summary of working paper 29968). *NBER Digest*. https://www.nber.org/digest/202207/el-salvadors-experiment-bitcoin-legal-tender

National Treasury & Economic Planning. (2023). *Virtual assets (VA) and virtual assets service providers (VASPs) money laundering (ML) and terrorism financing (TF) national risk assessment report*. https://www.frc.go.ke/wp-content/uploads/2024/02/VAs-and-VASPs-ML_TF-Risk-Assessment-Report-1.pdf

Ndalo, T.O. (2017). Multiple legal and regulatory framework in the banking and financial sector in Kenya: Addressing resultant complexities, disharmony and conflicts in policy goals. *University of Nairobi Repository*. http://erepository.uonbi.ac.ke/bitstream/handle/11295/108820/Ndalo_Multiple%20Legal%20and%20Regulatory%20Framework%20in%20the%20Banking%20and%20Financial%20Sector%20in%20Kenya-%20Addressing%20Resultant%20Complexities%2Cdisharmony%20and%20Conflicts%20in%20Policy%20Goals.pdf?sequence=1&isAllowed=y

Ng'ang'ira, J., & Nzaku, I. (2023). The Capital Markets (Amendment) Bill, 2023. (Kaplan & Statton). https://www.kaplanstratton.com/wp-content/uploads/2023/06/Capital-Markets-Amendment-Bill.pdf

Ngeta, B. (2020). The Enforceability of Clickwrap Agreements In Kenya. 24 May 2020. https://www.linkedin.com/pulse/enforceability-clickwrap-agreements-kenya-brian-ngeta

Njanja, A. (2023). Worldcoin ignored initial order to stop iris scans in Kenya, records show. *TechCrunch*. https://techcrunch.com/2023/08/15/worldcoin-in-kenya/

Norton Rose Fulbright. (2020). Singapore Payment Services Act: Impact on the payments industry. https://www.nortonrosefulbright.com/en/knowledge/publications/30a3bc47/singapore-payment-services-act-impact-on-the-payments-industry

Nwaokocha, A. (2024). Turkey sees surge in crypto license applications amid new regulations. *Cointelegraph*. https://cointelegraph.com/news/turkey-crypto-license-surge-regulations

Nzomo, V. (2017). E-Commerce and the Law in Kenya: Electronic Contracting. 1 November 2017. Strathmore University Centre for Intellectual Property and Information Technology Law (CIPIT). https://cipit.strathmore.edu/e-commerce-and-the-law-in-kenya-electronic-contracting/

Nzomo, V. (2018). E-Commerce and the Law in Kenya: Consumer Protection. 15 February 2018. Strathmore University Centre for Intellectual Property and Information Technology Law (CIPIT). https://cipit.strathmore.edu/e-commerce-and-the-law-in-kenya-consumer-protection/

Obura, F. (2024). CMA Exudes Confidence in Sandbox as it Admits, Graduates, Firms. 14 January 2024. The Kenyan Wallstreet. https://kenyanwallstreet.com/cma-exudes-confidence-in-sandbox-as-it-admits-graduates-firms/

OECD. (2014). Chapter 4: The digital economy, new business models and key features. In Addressing the Tax Challenges of the Digital Economy. https://doi.org/10.1787/9789264218789-en

OECD. (2024). Regulation and innovation. https://www.oecd.org/en/topics/sub-issues/better-regulation-and-innovation.html

Ogonjo, F., & Kitili, J. (2023). Case commentary on Worldcoin in Kenya. *Strathmore University Centre for Intellectual Property and Information Technology Law (CIPIT).* https://cipit.strathmore.edu/case-commentary-on-worldcoin-in-kenya/

Olive, M. S., & Jagdev, S. (2024). Understanding Slashing in Ethereum Staking: Its Importance & Consequences. (Consensys). https://consensys.io/blog/understanding-slashing-in-ethereum-staking-its-importance-and-consequences

Omondi, R., Obegi, E., & Ochieng, W. (2023). Tax implications of the Finance Act, 2023. *Oraro & Co*. https://www.oraro.co.ke/tax-implications-of-the-finance-act-2023/

Oraro & Co. (2024). The Virtual Assets Service Providers Bill 2024. *Oraro & Co*. https://www.oraro.co.ke/review-of-the-virtual-assets-service-providers-bill-2024/

Oraro, C., & Barasa, J. (2018). Consumer Protection Law in Kenya. (Oraro & Co). https://www.oraro.co.ke/2018/10/17/consumer-protection-law-in-kenya/

Orlando, P. (2023). Embracing Web3 Complexity: The Challenges and Opportunities for a New Generation of Companies. 25 April 2023. https://www.linkedin.com/pulse/embracing-web3-complexity-challenges-opportunities-perez-orlando

Osbourne v Persons Unknown Category A & Ors [2023] EWHC 39 (KB) (13 January 2023). https://knyvet.bailii.org/ew/cases/EWHC/KB/2023/39.html

Papenfuß, U., & Schmidt, C. A. (2020). Understanding self-regulation for political control and policymaking: Effects of governance mechanisms on accountability. *Governance*, 34(4), 1115-1141. https://doi.org/10.1111/gove.12549

Parliament of Kenya. (2023). Joint Ad Hoc Committee to probe cryptocurrency project Worldcoin operations in Kenya. *Parliament of Kenya*. http://www.parliament.go.ke/node/20618

PayPal. (2024). https://www.paypal.com/us/digital-wallet/manage-money/crypto

Perani, G. (2018). Blockchain: Is self-regulation sufficient? *Medium*. https://medium.com/coinmonks/blockchain-is-self-regulation-sufficient-5bb68ac7e33f

Pfeifer, M. (2009). Materials Enabled Designs. https://www.sciencedirect.com/book/9780750682879/materials-enabled-designs

PwC. (2022). *PwC global crypto regulation report 2023*. Retrieved from https://www.pwc.com/gx/en/new-ventures/cryptocurrency-assets/pwc-global-crypto-regulation-report-2023.pdf

Ragnedda, M., & Destefanis, G. (2019). Blockchain: A disruptive technology. In Ragnedda M. & Destefanis, G. (Eds.), Blockchain and Web 3.0: Social, economic, and technological challenges (pp. 1-11) Routledge, Taylor & Francis Group.

Ray, P. P. (2023). Web3: A comprehensive review on background, technologies, applications, zero-trust architectures, challenges and future directions. https://doi.org/10.1016/j.iotcps.2023.05.003

Rikken, O., Janssen, M., & Kwee, Z. (2023). Governance impacts of blockchain-based decentralized autonomous organizations: An empirical analysis. *Policy Design and Practice*, 6(4), 465–487. https://doi.org/10.1080/25741292.2023.2270220

Roy, S. (2023). The impact of blockchain technology on financial regulations and legal frameworks. https://doi.org/10.2139/ssrn.4521762

Ruas, I. C., Ben Dhaou, S., & Jordanoski, Z. (2023). Blockchain and the GDPR – The shift needed to move forward. CEUR Workshop Proceedings. https://ceur-ws.org/Vol-3449/paper14.pdf

Sandbeck, S., Kingsmith, A. T., & von Bargen, J. (2019). The Block is Hot. In Ragnedda M. & Destefanis, G. (Eds), Blockchain and Web 3.0: Social, economic, and technological challenges (pp. 17-29) Routledge, Taylor & Francis Group.

Sarmah, S. (2018). Understanding blockchain technology. Computer Science and Engineering, 8(2), 23-29. https://doi.org/10.5923/j.computer.20180802.02

Schrepel, T. (2023). The complex relationship between Web2 giants and Web3 projects. Computer Law & Security Review, Volume 50, September 2023, 105845. https://doi.org/10.1016/j.clsr.2023.105845

Securities Exchange Commission (SEC) vs W.J Howey Co., 328 U.S. 293 (1946). https://supreme.justia.com/cases/federal/us/328/293/

Shleifer, A. (2025). Understanding Regulation. *European Financial Management, 11*(4), 439–451. https://scholar.harvard.edu/sites/scholar.harvard.edu/files/shleifer/files/02_eufm00121.pdf

Shulist, J. (2018). *What is the role of regulation in digital finance?* https://www.financedigitalafrica.org/snapshot/what-is-the-role-of-regulation-in-digital-finance/

Simple. (2024). The Evolution of DAOs: From Governance to Collaborative Creativity. https://simple.app/blog/the-evolution-of-daos/

Smith, D. (2013). Robert Mugabe's land reform comes under fresh scrutiny. (The Guardian). https://www.theguardian.com/world/2013/may/10/robert-mugabe-land-reform

Spheron Network. (2024). Web3.0 in Africa. Navigating Regulatory Challenges and Embracing Innovation. https://blog.spheron.network/web30-in-africa-navigating-regulatory-challenges-and-embracing-

Sultan, K., Ruhi, U., & Lakhani, R. (2018). Conceptualizing blockchains: Characteristics & applications. https://www.researchgate.net/publication/325464908_Conceptualizing_Blockchains_Characteristics_Applications

Tapscott, D., & Vargas, R. V. (2019). Unleashing the power of blockchain in the enterprise. MIT Sloan Management Review. https://sloanreview.mit.edu/article/unleashing-the-power-of-blockchain-in-the-enterprise/

The Investopedia Team. (2024). Enterprise Ethereum Alliance (EEA): Meaning, Examples, and Membership. https://www.investopedia.com/terms/e/ethereum-enterprise-alliance-eea.asp

Tosh Marketing. (2024). The Relationship Between Blockchain and Web3. Global Tech Council. 13 June 2024. https://www.globaltechcouncil.org/blockchain/the-relationship-between-blockchain-and-web3/

Trozze, A., Kamps, J., Akartuna, E. A., Hetzel, F. J., Kleinberg, B., Davies, T., & Johnson, S. D. (2022). Cryptocurrencies and future financial crime. *Crime Science, 11*(1). https://doi.org/10.1186/s40163-021-00163-8

Uniswap. (2024). How Uniswap Works. https://docs.uniswap.org/contracts/v2/concepts/protocol-overview/how-uniswap-works#:~:text=Uniswap%20is%20an%20automated%20liquidity,%2C%20censorship%20resistance%2C%20and%20security .

US Government Accountability Office (GAO). (2016). Financial Regulation: Complex and Fragmented Structure Could Be Streamlined to Improve Effectiveness. https://www.gao.gov/products/gao-16-175

Walker, B. (2022). Debate: Can industry co-regulation offer greater consumer protection than Information Commissioner fines? The Chartered Institute of Marketing. https://www.cim.co.uk/newsroom/debate-can-industry-co-regulation-offer-greater-consumer-protection-than-information-commissioner-fines/ .

Walubengo, J. (2024). Government indifference hampering Kenya's crypto landscape. (KICTAnet). https://www.kictanet.or.ke/government-indifference-hampering-kenyas-crypto-landscape/

Wang, Q., Li, R., Wang, Q., Chen, S., Ryan, M., & Hardjono, T. (2022). Exploring Web3 from the view of blockchain. https://doi.org/10.48550/arXiv.2206.08821

Web3.0 Research Group. (2022). Web3.0 Research Group's Report-Toward Sound Development of Web3.0. https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/a

Wiegmann, P.M., De Vriesa, H. J. & Blind, K. (2017). Multi-mode standardisation: A critical review and a research agenda. *Eindhoven University of*

Technology 46 (8) , October 2017, 1370-1386. http://dx.doi.org/10.1016/j.respol.2017.06.002

Wiseman Talent Ventures v. Capital Markets Authority [2019] eKLR (Civil Suit No. 08/2019). https://kenyalaw.org/caselaw/cases/view/182238

Wolford, B. (2024). What is GDPR, the EU's new data protection law? GDPR EU. https://gdpr.eu/what-is-gdpr/

Wood, G. (2018). Why we need Web 3.0. https://gavofyork.medium.com/why-we-need-web-3-0-5da4f2bf95ab

World Economic Forum. (2020). Legal and Regulatory Compliance. https://widgets.weforum.org/blockchain-toolkit/legal-and-regulatory-compliance/index.html

World Economic Forum. (2023). Top 10 Emerging Technologies of 2023. Center for the Fourth Industrial Revolution. https://www3.weforum.org/docs/WEF_Top_10_Emerging_Technologies_of_2023.pdf

Wren-Lewis, L. (2011). Regulatory Capture: Risks and Solutions. January 2011. https://www.researchgate.net/publication/265962949_Regulatory_Capture_Risks_and_Solutions

Wright, T. (2023). Parliamentary committee calls for shutdown of Worldcoin in Kenya. *Cointelegraph*. https://cointelegraph.com/news/kenya-parliamentary-committee-shutdown-worldcoin

Wu, H. Y., Yang, X., Yue, C., Paik, H., & Kanhere, S. S. (2022). Chain or DAG? Underlying data structures, architectures, topologies and consensus in distributed ledger technology: A review, taxonomy and research issues. Journal of Systems Architecture, 131, 102720. https://www.sciencedirect.com/science/article/abs/pii/S1383762122002077

Xu, H. (2024). Regulatory fragmentation and internal control weaknesses. Journal of Accounting and Public Policy, Volume 44, March–April 2024, 107191. 19 February 2024. https://doi.org/10.1016/j.jaccpubpol.2024.107191

Xu, M., Chen, X., & Kou, G. (2019). A systematic review of blockchain. *Financial Innovation, 5*, 27. https://doi.org/10.1186/s40854-019-0147-z

York, H.D. & Wong, K. (2016). Blockchain and Smart Contracts: The dawn of the Internet of Finance? Communications Law Bulletin, Vol 35.3 (September 2016), Page 25. https://classic.austlii.edu.au/au/journals/CommsLawB/2016/26.pdf

Zimwara, T. (2024). Nairobi Securities Exchange, Valour sign MOU to enable trade of digital asset ETPs in Africa. *Bitcoin.com News*. https://news.bitcoin.com/nairobi-securities-exchange-valour-sign-mou-to-enable-trade-of-digital-asset-etps-in-africa/