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Evaluating the Sufficiency of the data protection act 2023 in the age of Artificial Intelligence (AI): A comparative case study of Nigeria and the USA

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Abstract

The rapid expansion of artificial intelligence (AI) has become a pivotal force in shaping modern society, drawing comparisons to the tech boom of the late 1990s and early 2000s. With AI applications ranging from military and defence systems to corporate tools and household devices, its transformative potential is undeniable. This paper examines the development and regulation of AI on a global scale, focusing on the legislative frameworks in Nigeria and the USA. Specifically, it evaluates the sufficiency of Nigeria's Data Protection Act 2023 in addressing the unique challenges posed by AI. By comparing Nigeria's approach with that of the USA, the paper highlights key regulatory gaps, the distinction between AI and robotics, and the importance of establishing a legal personality for AI systems. The comparative analysis offers insights into how both countries are preparing for the future of AI, emphasizing the need for early legal intervention to ensure safe and ethical AI integration. Recommendations are provided for policymakers to strengthen regulatory mechanisms in both nations, ensuring they are equipped to handle the rapid evolution of AI technology.

Key words: Artificial Intelligence (AI) Regulation; Data Protection Act 2023; Algorithmic Bias; Ethical AI Development; Transparency in AI; AI Governance Frameworks

1 Introduction

1.1 Overview of AI Growth and Global Impact

The rapid growth of AI has transformed industries globally, mirroring the technological explosion seen in previous decades. AI has evolved from being a niche technology to a mainstream tool, driving innovation across diverse sectors such as healthcare, finance, and defence. The United States leads in AI adoption, with significant investments in research and practical applications, including autonomous systems, data analytics, and cybersecurity (Owolabi, 2023). In Nigeria, AI adoption is gaining traction, particularly in the financial services and telecommunications sectors, where it is leveraged to enhance service delivery and operational efficiency (Owolabi, 2023). However, the regulatory framework in Nigeria lags behind the USA, raising concerns about data privacy and ethical implications. The global impact of AI emphasizes the need for robust, adaptive regulatory frameworks to mitigate risks while fostering innovation (Russell & Norvig, 2016). This comparative analysis underscores the urgency for both countries to strengthen their AI governance mechanisms in response to its rapid growth.

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1.1.1 Introduction to the Rapid Expansion of AI and Its Role in Modern Society

AI has experienced unprecedented growth, significantly impacting various facets of modern society. The technology's ability to mimic human cognitive processes has allowed it to penetrate industries ranging from finance and healthcare to education and defense. AI-driven innovations such as machine learning algorithms and autonomous systems are revolutionizing workflows, enhancing efficiency, and transforming decision-making processes (Owolabi, 2023) as represented in figure 1. In developed economies like the United States, AI plays a pivotal role in driving competitiveness and addressing complex challenges in areas such as cybersecurity and public health. Meanwhile, in emerging economies like Nigeria, AI adoption is gradually reshaping key sectors like telecommunications and finance, despite regulatory challenges (Russell & Norvig, 2016). The increasing reliance on AI underscores the urgent need for robust legal frameworks to manage its ethical and practical implications.

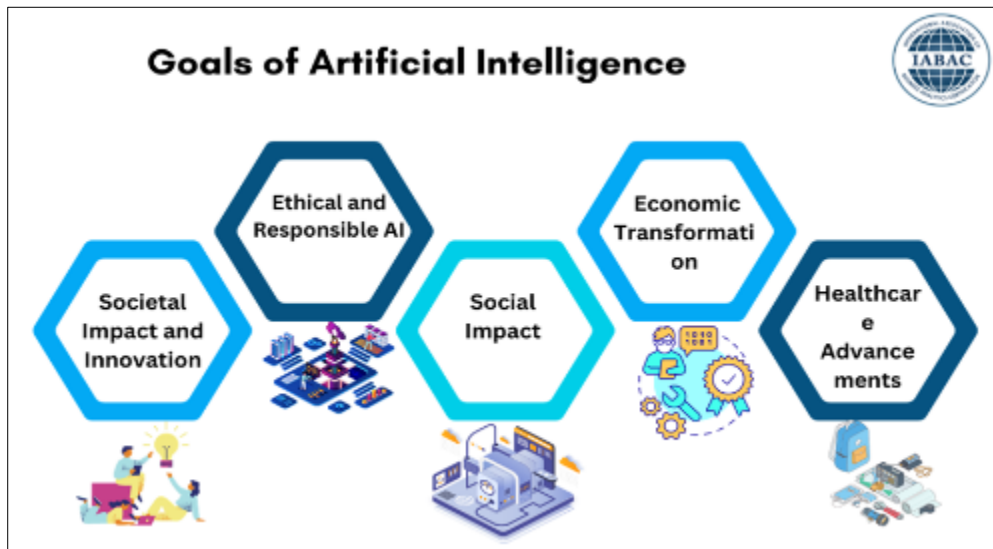


Figure 1 Role of Artificial Intelligence in Modern Society. (IABAC., 2024)

Figure 1 highlights key areas where AI is driving innovation and change, including societal impact, healthcare advancements, economic transformation, social impact and ethical AI practices. This aligns with the section "Introduction to the Rapid Expansion of AI and Its Role in Modern Society," where AI has experienced unprecedented growth, reshaping various sectors. In both Nigeria and the USA, AI has permeated industries such as healthcare, finance, and education, though the extent and regulatory frameworks differ. In the USA, AI's role in economic transformation is more pronounced, supported by advanced infrastructures, while in Nigeria, AI adoption is growing but faces challenges in regulatory oversight and technological capacity. Both nations are working towards responsible AI to ensure ethical outcomes but the USA's more advanced infrastructure allows it to lead in AI-driven economic transformation and healthcare advancements also, the USA's sector-specific regulations offer a more structured approach compared to Nigeria's emerging framework. AI's societal impact is evident, as it reshapes economies, healthcare, and ethical considerations globally.

1.1.2 Comparison of AI's Impact on Technological Innovation in Nigeria and the USA

AI has had a transformative impact on technological innovation in both Nigeria and the USA, albeit at different scales. In the USA, AI plays a critical role in advanced sectors such as healthcare, defense, and autonomous systems, driving cutting-edge research and innovation (Russell & Norvig, 2016). Nigeria, on the other hand, is in the early stages of AI adoption, focusing primarily on financial services, telecommunications, and agriculture. While Nigeria's AI applications are still emerging, they offer significant potential for enhancing efficiency and economic growth, albeit with regulatory gaps that need to be addressed (Owolabi, 2023).

1.2 Importance of AI Regulation in the Digital Age

As AI continues to revolutionize industries, the importance of regulating its growth becomes increasingly crucial. In the digital age, AI impacts areas such as data privacy, security, and decision-making, raising ethical and legal concerns that cannot be ignored (Owolabi, 2023). Unregulated AI can lead to misuse, bias, and the infringement of personal rights, particularly in areas like healthcare, finance, and law enforcement. The USA has taken steps toward AI regulation, focusing on frameworks that balance innovation with consumer protection (Russell & Norvig, 2016). Nigeria, while

progressing in AI adoption, requires a more comprehensive legal infrastructure to address the ethical and societal risks posed by AI technologies. Effective regulation ensures responsible AI deployment, fostering innovation while safeguarding human rights and ensuring accountability.

Table 1 Summary of Why AI Regulation is Essential with the Rise of AI's Use in Various Sectors

Sector	AI applications	Risks without Regulation	Importance of Regulation
Healthcare	Predictive diagnostics, medical imaging	Privacy invasion, biased treatment decisions	Ensures patient data privacy, fairness in AI decisions
Finance	Fraud detection, risk management	Algorithmic bias, unfair financial outcomes	Protects consumers, ensures transparency and fairness
Defense	Autonomous systems, surveillance	Lack of accountability, misuse of AI in warfare	Maintains ethical use, ensures accountability
Telecommunication	Network optimization, customer service	Data misuse, lack of transparency in decision-making	Safeguards data, promotes fair and responsible use

1.2.1 Why AI Regulation is Essential, particularly with the Rise of AI's Use in Various Sectors

AI regulation is essential as the technology increasingly penetrates critical sectors like healthcare, finance, defense, and telecommunications. Without regulation, AI systems can operate unchecked, leading to potential misuse, bias, and violations of privacy (Owolabi, 2023) as presented in figure 1. In sectors such as finance, unregulated AI could create significant risks, including security breaches and unethical financial predictions (Almada & Petit, 2023). In healthcare, biased algorithms could lead to inaccurate diagnoses, compromising patient safety. Regulatory frameworks help ensure that AI is deployed responsibly, safeguarding human rights, promoting fairness, and fostering trust in AI systems (Eke, & Wakunuma, 2023).

1.2.2 Ethical, Legal, and Social Implications of AI

The rapid expansion of AI raises critical ethical, legal, and social concerns. Ethically, AI systems may perpetuate biases in decision-making processes, leading to unfair outcomes, particularly in sensitive sectors such as healthcare and law enforcement (Owolabi, 2023) as represented in figure 2. Legally, the lack of comprehensive regulation in countries like Nigeria complicates the assignment of liability when AI systems malfunction or cause harm. Socially, AI's influence on job displacement and privacy invasion presents significant challenges (Bulgakova, 2023). Thus, robust legal frameworks are necessary to mitigate these risks and ensure that AI technology is used responsibly and equitably (Sedola et al., 2021).



Figure 2 Legal and Ethical Consideration in Artificial Intelligence in Healthcare. (Front. S., 2022)

Figure 2 visually presents the ethical and legal considerations in AI, emphasizing key challenges in both domains. On the ethical side, AI systems must ensure regulation, privacy, mitigation of bias, transparency, and relevance. Ethically, AI may perpetuate biases in decision-making processes, leading to unfair outcomes in sensitive sectors like healthcare. For instance, biased algorithms could result in discriminatory practices, affecting vulnerable populations. On the legal side, AI presents issues related to governance, confidentiality, liability, accuracy, and decision-making. In countries like Nigeria, the lack of comprehensive regulation complicates the assignment of liability when AI systems malfunction or cause harm. Legal frameworks must establish clear accountability, ensuring that both AI developers and users are held responsible for AI-driven decisions. The diagram also highlights other important aspects, such as security, transparency, inclusion, and robot rights, emphasizing the need for a balanced approach to ethical and legal AI governance.

1.3 Purpose of the Comparative Study

The purpose of this comparative study is to assess the sufficiency of AI regulatory frameworks in Nigeria and the USA, particularly focusing on data protection laws such as Nigeria's Data Protection Act 2023 and similar regulations in the USA. As AI adoption accelerates in both nations, it is critical to analyze the regulatory approaches to safeguard data privacy, ensure ethical AI use, and address legal liabilities (Owolabi, 2023). This study examines how these two countries, at different stages of AI development, are responding to emerging challenges, including the ethical and legal implications of AI (Almada & Petit, 2023). By comparing Nigeria's nascent regulatory environment with the USA's more developed framework, the study aims to provide recommendations for improving AI governance in both countries, ensuring that AI is used responsibly and in a manner that promotes innovation without compromising fundamental rights (Eke & Wakunuma, 2023).

1.3.1 *The Rationale for Comparing AI Regulatory Frameworks Between Nigeria and the USA*

The rationale for comparing AI regulatory frameworks between Nigeria and the USA stems from the contrasting stages of AI adoption and regulation in both countries. While the USA is a global leader in AI development, with a comprehensive regulatory framework designed to balance innovation and privacy, Nigeria's regulatory landscape is still emerging, particularly with the introduction of the Data Protection Act 2023 (Owolabi, 2023). This comparison provides valuable insights into how nations with differing levels of technological advancement address similar challenges, such as data protection, ethical concerns, and liability (Papyshev & Yarime, 2023; Eke et al., 2023). By examining both countries' approaches, this study offers guidance on strengthening AI governance in Nigeria.

1.3.2 *Introduction to the Data Protection Act 2023 as a Case Study for Nigeria*

The Data Protection Act 2023 serves as a foundational legislative response to the growing use of AI in Nigeria, particularly in data-intensive sectors like finance and telecommunications. The Act provides a legal framework for the collection, processing, and protection of personal data, with specific implications for AI-driven technologies (Owolabi, 2023). As AI systems become more integrated into daily operations, concerns around data privacy, misuse, and liability arise. The Act is Nigeria's first step toward establishing comprehensive data governance, yet its scope remains limited in addressing AI-specific challenges compared to more mature regulations in countries like the USA (Reed & Grieman, 2023).

2 The Data Protection Act 2023 and AI Regulation in Nigeria

2.1 Overview of the Data Protection Act 2023

The Data Protection Act 2023 represents Nigeria's most significant legislative effort to address the privacy and security challenges posed by the rise of AI. The Act governs how personal data is collected, processed, and stored, with specific provisions relevant to AI technologies, particularly those used in the financial services and telecommunications sectors (Owolabi, 2023) as presented in table 2. One of its key features is the imposition of stricter guidelines on data controllers and processors, ensuring accountability for data misuse. While this legislation is a step forward, it lacks comprehensive coverage of AI-specific issues such as algorithmic bias and liability, which remain critical in advanced AI deployments. In comparison, countries like the USA have adopted more mature and robust frameworks to regulate AI technologies (Papyshev & Yarime, 2023). The Data Protection Act sets a foundation for future regulatory developments aimed at governing Nigeria's growing AI landscape.

Table 2 Summary of the Data Protection Act 2023 Overview

Provisions	Key Features	Relevance to AI	Challenges
Data Privacy and Consent	Requires consent for data collection and processing	AI systems must obtain user consent for data use	Difficulty in ensuring informed consent in complex AI systems
Data Security	Mandates robust data security measures	Ensures AI-driven technologies protect sensitive data	Lack of comprehensive AI-specific security guidelines
Data Controller Accountability	Holds data controllers responsible for data misuse	Encourages accountability for AI-driven decisions	Limited provisions for algorithmic transparency
Cross-border Data Transfers	Regulates international data transfers	Affects global AI systems handling Nigerian data	Weak enforcement and monitoring mechanisms

2.1.1 Key Provisions of Nigeria's Data Protection Act and Its Relevance to AI

Nigeria's Data Protection Act 2023 outlines several key provisions that are highly relevant to the use of AI. The Act mandates that data controllers and processors must obtain consent before collecting personal data, ensure data security, and limit data usage to the intended purposes (Owolabi, 2023). For AI systems, these provisions help to mitigate concerns around privacy and data misuse, as AI relies on large datasets for training and decision-making. However, the Act lacks comprehensive coverage of AI-specific challenges, such as bias in algorithmic decisions or the need for transparency in AI systems (Reed & Grieman, 2023).

2.2 AI Use Cases in Nigeria's Key Sectors

AI has begun to reshape several key sectors in Nigeria, with its most significant impact seen in financial services, telecommunications, and healthcare. In the financial sector, AI is employed for fraud detection, predictive analytics, and customer service through AI-driven chatbots, improving operational efficiency (Owolabi, 2023). In telecommunications, AI plays a pivotal role in optimizing networks and enhancing customer experience, particularly with the rise of data-driven services. The healthcare sector in Nigeria is gradually adopting AI for diagnostics and patient management, although at a slower pace compared to other industries. These AI applications highlight the growing importance of data protection, particularly in safeguarding sensitive information, and underscore the need for tailored regulatory frameworks (Reed & Grieman, 2023). As AI adoption continues to expand, Nigeria's regulatory landscape must evolve to address the specific challenges posed by these technologies.

2.2.1 Analysis of AI Adoption in Nigeria's Healthcare, Fintech, and Telecommunications Sectors

AI adoption in Nigeria is steadily growing, with significant applications across healthcare, fintech, and telecommunications. In healthcare, AI is primarily used for diagnostic purposes and enhancing patient management systems, although its widespread use is still in development (Owolabi, 2023). The fintech sector has embraced AI for fraud detection, risk assessment, and improving customer service through automated chatbots. Meanwhile, the telecommunications industry uses AI to optimize network efficiency and personalize customer experiences (Reed & Grieman, 2023). These advancements highlight AI's transformative potential but also underscore the importance of robust data protection frameworks to address privacy concerns in these sectors.

2.3 Challenges in Enforcing AI Regulation

Enforcing AI regulation in Nigeria presents several significant challenges, particularly due to the nascent stage of its AI infrastructure. One primary issue is the lack of comprehensive legal frameworks that specifically address AI-driven technologies, making it difficult to assign liability and manage ethical concerns such as bias and transparency (Owolabi, 2023). Another challenge is the inadequacy of technical expertise among regulators, which hinders effective enforcement of existing laws, such as the Data Protection Act 2023. Additionally, many organizations in Nigeria are reluctant to invest in AI governance due to perceived high costs, leading to weak adherence to regulatory requirements (Reed & Grieman, 2023). For effective enforcement, there is a pressing need for capacity building among regulators, increased public-private collaboration, and more stringent penalties for non-compliance. Addressing these challenges will ensure responsible AI deployment that aligns with both national and international best practices.

2.3.1 Legal and Regulatory Gaps in Addressing AI's Rapid Growth

Nigeria faces significant legal and regulatory gaps in managing the rapid growth of AI. While the Data Protection Act 2023 is a step forward, it lacks provisions specifically designed to handle the complexities of AI, such as algorithmic accountability, liability, and transparency (Owolabi, 2023). Additionally, the absence of a clear legal framework for AI's integration into critical sectors like healthcare and finance complicates the assignment of responsibility in cases of AI failure or misuse. To address these gaps, Nigeria needs more targeted regulations that align with global best practices, ensuring responsible AI growth (Papyshev & Yarime, 2023).

2.3.2 The Need for Further Legislation to Address AI-Specific Concerns

The rapid adoption of AI in Nigeria has highlighted the need for more comprehensive legislation to address AI-specific concerns. While the Data Protection Act 2023 establishes a foundation for data privacy, it does not adequately cover issues such as algorithmic bias, AI-driven decision-making, or liability for autonomous systems (Owolabi, 2023). AI's potential for misuse, particularly in sensitive sectors like finance and healthcare, requires tailored regulatory frameworks to mitigate risks (Mugo, M. E., et al, 2024). Further legislation is essential to promote accountability and transparency in AI development, ensuring that both ethical and legal standards are met (Eke et al., 2023).

2.4 Ethical and Data Privacy Concerns

The integration of AI in Nigeria raises significant ethical and data privacy concerns, particularly in sectors such as healthcare and finance, where sensitive information is heavily utilized. AI systems, if left unchecked, may perpetuate biases in decision-making, leading to unfair outcomes in critical areas like patient diagnostics or financial lending (Owolabi, 2023). Furthermore, AI's reliance on large datasets raises privacy concerns, as the potential for data misuse increases without adequate safeguards. While Nigeria's Data Protection Act 2023 addresses some of these challenges, it falls short in covering AI-specific risks such as algorithmic transparency and accountability (Reed & Grieman, 2023). Strengthening regulatory frameworks to address these concerns is crucial for fostering trust and ensuring that AI technologies are used ethically and responsibly, aligning with global best practices (Eke et al., 2023).

2.4.1 How the Data Protection Act Addresses or Fails to Address Ethical Issues such as Privacy, Bias, and Liability

Nigeria's Data Protection Act 2023 makes notable strides in addressing data privacy by mandating strict regulations on data collection, consent, and processing (Owolabi, 2023). However, the Act falls short in tackling AI-specific ethical issues, such as algorithmic bias and liability (Bulgakova, 2023). It lacks provisions for ensuring transparency in AI decision-making processes, which could lead to biased outcomes in sectors like healthcare and finance. Moreover, the Act does not address liability concerns when AI-driven systems malfunction or cause harm. This highlights the need for more comprehensive legislation to address these critical issues (Almada & Petit, 2023).

3 AI Regulatory Frameworks in the USA

3.1 Overview of AI Regulation in the USA

Table 3 Summary of AI Regulation in the USA Overview

Regulation/Framework	Key Features	Relevance to AI	Challenges
California Consumer Privacy Act (CCPA)	Protects consumer privacy, allows opt-out of data sales	Impacts AI systems that rely on consumer data for decision-making	Fragmented regulation, lacks AI-specific provisions
Health Insurance Portability and Accountability Act (HIPAA)	Protects health data privacy	Regulates AI-driven systems in healthcare	Limited applicability outside healthcare
Federal Trade Commission (FTC) Guidelines	Focus on transparency, fairness, and accountability	Ensures AI systems do not engage in deceptive practices	Primarily advisory, lacks enforcement power across all sectors
National Institute of Standards and Technology (NIST)	Provides voluntary guidelines for AI risk management	Encourages responsible AI development and innovation	No binding legal authority, sectoral gaps

The United States is at the forefront of AI regulation, balancing innovation with concerns over data privacy, security, and ethical considerations. U.S. regulatory frameworks, while not yet fully comprehensive, are evolving to address the growing impact of AI in various sectors such as healthcare, finance, and defense (Almada & Petit, 2023) as presented in table 3. The Federal Trade Commission (FTC) and the National Institute of Standards and Technology (NIST) play key roles in ensuring AI systems align with privacy standards and do not harm consumer rights. However, the U.S. AI regulatory landscape is fragmented, with sector-specific laws like the California Consumer Privacy Act (CCPA) addressing data protection issues, but lacking a unified federal AI law (Reed & Grieman, 2023). This decentralized approach contrasts with more comprehensive international models, like the European Union's AI Act, highlighting the need for federal legislation to govern AI comprehensively in the U.S (Mugo, M. E., et al, 2024).

3.1.1 Key Laws and Policies Governing AI in the USA, Including the Role of Data Protection

In the United States, AI regulation is governed by a patchwork of sector-specific laws, including the California Consumer Privacy Act (CCPA), which sets high standards for data protection, and the Health Insurance Portability and Accountability Act (HIPAA), which regulates AI in healthcare settings (Reed & Grieman, 2023). The Federal Trade Commission (FTC) enforces rules around privacy, ensuring AI systems do not infringe on consumer rights. Although comprehensive federal AI legislation is still lacking, the National Institute of Standards and Technology (NIST) provides voluntary guidelines for AI risk management. These laws and policies, though fragmented, aim to protect privacy while fostering innovation (Calo, R. 2015).

3.2 Sector-Specific AI Use Cases in the USA

In the United States, AI adoption spans multiple sectors, revolutionizing industries with advanced applications. In healthcare, AI is used for predictive diagnostics, medical imaging, and personalized medicine, significantly improving patient outcomes (Owolabi, 2023). The financial sector leverages AI for fraud detection, algorithmic trading, and risk management, enhancing decision-making and operational efficiency (Calo, R. 2015). In defense, AI drives autonomous systems, surveillance, and cybersecurity initiatives, ensuring national security in an increasingly digital environment. These sector-specific applications demonstrate the transformative power of AI but also highlight the importance of robust regulatory frameworks to ensure ethical use and accountability in these critical fields (Eke & Wakunuma, 2023).

3.2.1 AI Adoption in Critical Industries Such as Defense, Healthcare, and Finance

AI adoption in the United States has had a profound impact on critical industries like defense, healthcare, and finance. In defense, AI is utilized for autonomous systems, cybersecurity, and surveillance, enhancing national security capabilities (Calo, R. 2015). In healthcare, AI-driven technologies such as predictive diagnostics and medical imaging have improved patient care and outcomes (Owolabi, 2023) as represented in figure 3. The finance sector leverages AI for algorithmic trading, risk management, and fraud detection, optimizing financial operations and decision-making (Eke & Wakunuma, 2023). These sector-specific implementations underscore the importance of evolving regulatory frameworks to manage AI's ethical and operational challenges in these high-stakes fields (Idoko P. I., et al, 2024).



Figure 3 AI in the Health sector (Jeff, L. 2018)

Figure 3 depicts a healthcare professional monitoring a patient undergoing a medical imaging procedure or scan likely an MRI or CT scan highlighting the role of AI in revolutionizing healthcare. AI-driven technologies such as predictive diagnostics and advanced medical imaging systems have greatly enhanced patient care and outcomes. By utilizing machine learning algorithms, AI systems can analyze large amounts of medical data, detecting patterns and anomalies that may not be immediately visible to human eyes. This allows for earlier diagnoses, more personalized treatment plans, and overall improved patient outcomes. In critical areas like cancer detection, AI tools are used to analyze imaging scans with increased precision, helping healthcare professionals make more informed decisions. As AI continues to advance, its adoption in healthcare is poised to further optimize diagnostic accuracy, reduce human error, and enhance the efficiency of treatment delivery.

3.3 Challenges and Opportunities in AI Regulation

Regulating AI in the USA presents both significant challenges and opportunities. One of the key challenges is the fragmented nature of AI regulation, with sector-specific laws such as the California Consumer Privacy Act (CCPA) addressing privacy but lacking a unified federal framework for AI governance (Owolabi, 2023) as represented in figure 4. The rapid pace of AI development also complicates regulation, as laws struggle to keep up with technological advancements (Ijiga, A. C., et al, 2024). However, this creates opportunities for the USA to lead globally by developing comprehensive, flexible AI regulations that balance innovation with ethical concerns (Almada & Petit, 2023). Strengthening public-private collaboration and focusing on transparency and accountability can foster trust while enabling responsible AI growth across sectors.

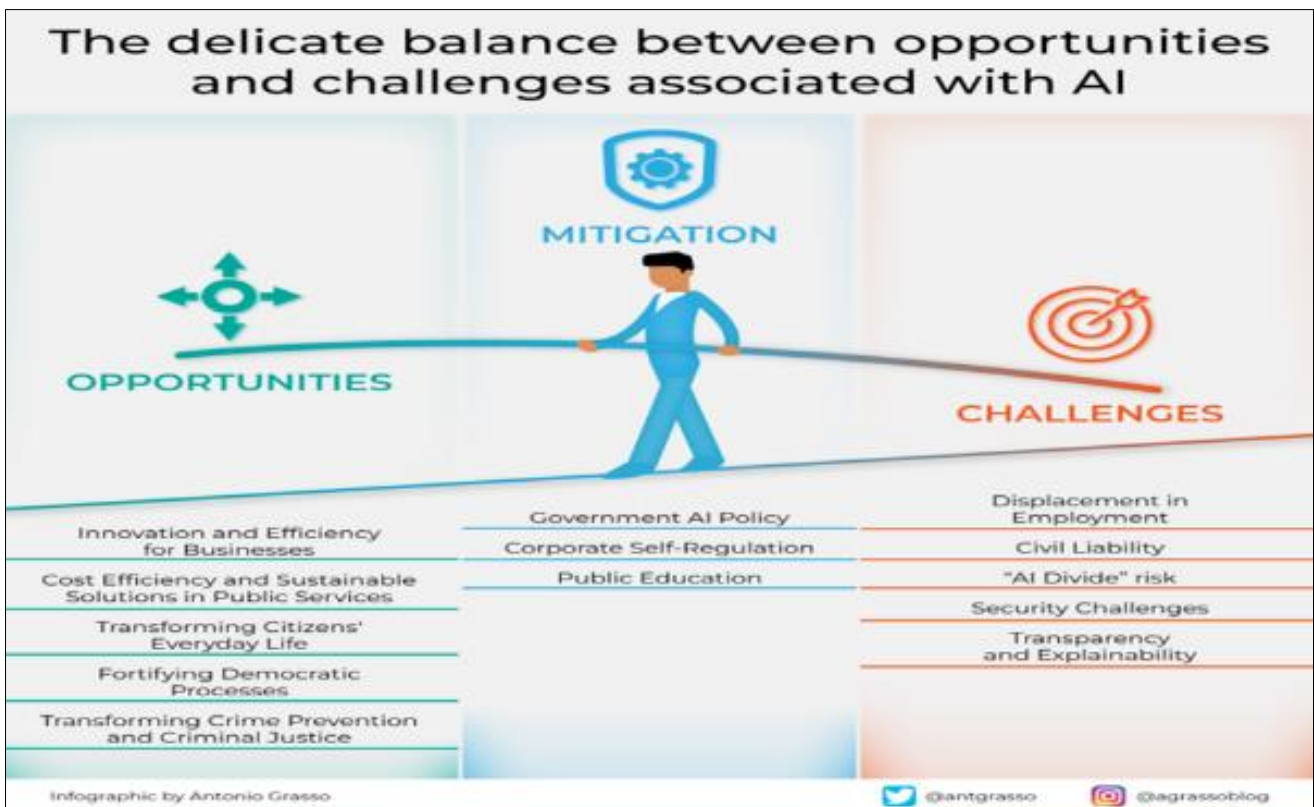


Figure 4 Walking the Tightrope between AI Opportunities and Ethical Challenges (Antonio, G. 2023)

Figure 4 illustrates the dual nature of AI development, showcasing both the potential benefits and the inherent challenges. On the left side, AI offers opportunities like increased innovation and efficiency in business, cost-effective public services, and advancements in crime prevention and democratic processes. These benefits, however, are counterbalanced by significant challenges on the right side, such as job displacement, civil liability, security risks, and the "AI divide" between those who can access AI technology and those who cannot. The figure in the middle represents the role of mitigation strategies, such as government AI policies, corporate self-regulation, and public education, which aim to strike a balance between fostering innovation and addressing ethical, legal, and societal concerns. This visual effectively conveys the need for comprehensive AI regulation that encourages growth while managing risks associated with its deployment.

3.3.1 *The USA's Approach to Regulating AI While Fostering Innovation*

The USA's approach to regulating AI aims to balance the need for innovation with the protection of consumer rights and ethical standards. Rather than a single, overarching AI regulation, the USA has adopted a sector-specific strategy that includes laws like the California Consumer Privacy Act (CCPA) and guidelines from the National Institute of Standards and Technology (NIST) to ensure privacy and security (Owolabi, 2023). This approach allows industries to innovate while adhering to essential regulatory frameworks. However, critics argue that a more cohesive, federal AI policy is needed to address the growing complexity of AI technologies (Papyshev & Yarime, 2023).

3.3.2 *The Balance Between Technological Advancement and Data Protection*

In the USA, balancing technological advancement with data protection remains a core challenge in AI regulation. As AI systems increasingly rely on vast amounts of personal data for decision-making and automation, the risks to privacy escalate (Owolabi, 2023). Sector-specific regulations such as the California Consumer Privacy Act (CCPA) provide some safeguards, yet gaps remain in ensuring comprehensive data protection. The key is fostering innovation while maintaining robust data privacy standards, which requires ongoing adjustments to regulations to keep pace with AI's rapid evolution. Further, the development of flexible federal frameworks can ensure accountability while encouraging technological growth (Calo, R. 2015).

4 Comparative Analysis of AI Regulation Between Nigeria and the USA

4.1 Regulatory Approaches: Sectoral vs. Comprehensive

The regulatory approaches to AI in Nigeria and the USA highlight key differences between sectoral and comprehensive models. The USA primarily adopts a sector-specific approach, with regulations like the California Consumer Privacy Act (CCPA) addressing AI within the broader context of data privacy (Ijiga, A. C., et al, 2024) as presented in table 4. This allows for flexibility and rapid technological advancements in industries such as healthcare and finance but leads to regulatory fragmentation (Owolabi, 2023). In contrast, comprehensive frameworks, such as the European Union's AI Act, offer unified regulation across sectors, addressing ethical, legal, and social concerns holistically (Almada & Petit, 2023). Nigeria's regulatory framework remains fragmented, creating challenges for effectively managing AI's ethical and legal implications across various sectors.

Table 4 Summary of Regulatory Approaches: Sectoral vs. Comprehensive

Regulatory Approach	Key Features	Advantages	Challenges
Sectoral (USA)	AI regulation based on industry-specific laws (e.g., CCPA, HIPAA)	Flexible, allows innovation tailored to industry needs	Fragmented, lacks a unified framework across sectors
Comprehensive (EU)	Unified AI regulation across all sectors (e.g., EU AI Act)	Ensures consistency and uniform ethical standards	Can be less flexible and slow to adapt to industry needs
Nigeria (Emerging sectoral)	Focus on data protection with sectoral gaps (e.g., Data Protection Act 2023)	Provides foundational regulation, adaptable in key sectors	Lacks comprehensive AI-specific provisions, enforcement challenges
Hybrid Approach	Combines sectoral and overarching regulations	Balances flexibility with uniform ethical standards	Difficult to implement and coordinate across sectors

4.1.1 *Nigeria's Sector-Specific Regulatory Framework Compared to the USA's More Comprehensive Approach*

Nigeria's AI regulatory framework remains highly sector-specific, focusing primarily on data privacy through the Data Protection Act 2023. This fragmented approach limits the country's ability to address AI-specific challenges like algorithmic bias and liability across sectors (Owolabi, 2023). In contrast, the USA has adopted a more comprehensive approach, albeit still evolving, with regulations such as the California Consumer Privacy Act (CCPA) and industry-specific guidelines from the National Institute of Standards and Technology (NIST) addressing AI-related concerns (Papyshev & Yarime, 2023). While both countries face regulatory gaps, the USA's more structured approach provides better tools for managing AI's rapid growth across industries.

4.2 Data Protection and Privacy Regulations

Data protection and privacy regulations are critical in ensuring responsible AI development and use. In Nigeria, the Data Protection Act 2023 aims to protect personal data but lacks AI-specific provisions to address challenges such as algorithmic transparency, bias, and liability (Owolabi, 2023). The Act mandates data controllers to obtain consent and adhere to strict data handling protocols, yet it does not sufficiently cover the intricacies of AI technologies, which rely on large datasets. In contrast, the United States takes a more comprehensive approach with sector-specific laws like the California Consumer Privacy Act (CCPA) and HIPAA in healthcare, setting clear standards for data privacy (Calo, R 2015). However, both countries need more robust federal frameworks that address AI-specific issues such as data misuse, ethical concerns, and potential liabilities. Strengthening these regulations will be critical to managing AI's rapid evolution and its impact on privacy (Ijiga, A. C., et al, 2024).

4.2.1 A Comparative Analysis of the Nigeria Data Protection Act 2023 and the USA's Relevant Data Protection Laws (e.g., California Consumer Privacy Act, HIPAA)

The Nigeria Data Protection Act 2023 and the USA's California Consumer Privacy Act (CCPA) differ in scope and enforcement (Adu-Twum, H. T., et al, 2024). Nigeria's Act emphasizes personal data protection, requiring consent and compliance from data controllers, but lacks comprehensive AI-specific provisions (Owolabi, 2023) as presented. The CCPA, in contrast, offers more robust protections, particularly for consumer privacy, including the right to access, delete, and opt out of data sales. Additionally, HIPAA in the healthcare sector provides strict guidelines for handling sensitive medical data in AI applications (Calo, R. 2015). While both frameworks focus on privacy, the USA's sectoral approach offers more detailed protections in specific industries.

Table 5 Comparative Analysis of the Nigeria Data Protection Act 2023 and the USA's Relevant Data Protection Laws

Aspect	Nigeria Data Protection Act 2023	USA (CCPA, HIPAA)	Key Differences
Scope	Focuses on data privacy and consent across industries	CCPA focuses on consumer data; HIPAA on healthcare data	Nigeria lacks AI-specific provisions; USA has sector-specific laws
Consent	Requires explicit consent for data collection and processing	CCPA mandates opt-out for data sales, HIPAA mandates strict consent for health data	Nigeria mandates consent broadly; CCPA allows opt-out
Accountability	Data controllers held accountable for breaches	CCPA imposes fines for breaches; HIPAA enforces strict penalties for health data violations	USA has stricter enforcement and penalties
AI-Specific Provisions	Lacks clear AI-specific provisions	No unified AI regulation; sectoral rules (e.g., HIPAA) apply	Both countries lack comprehensive AI regulation

4.3 Liability and Legal Frameworks for AI Systems

Liability and legal frameworks for AI systems remain underdeveloped, posing significant challenges in both Nigeria and the USA. In Nigeria, the Data Protection Act 2023 focuses on data privacy but does not adequately address the complexities of assigning liability for AI-driven decisions or failures (Owolabi, 2023). For instance, in sectors such as healthcare and finance, where AI systems can make critical decisions, it is unclear who bears responsibility if an AI system makes an error—whether it be the developer, the user, or the data provider (Ijiga, A. C., et al, 2024). In the USA, sectoral regulations like HIPAA and the California Consumer Privacy Act (CCPA) provide some guidance for data privacy but still leave gaps in liability, especially concerning autonomous AI systems (Calo, R. 2015). As AI systems continue to evolve and become more integrated into essential sectors, comprehensive legal frameworks are needed in both countries to clarify liability, ensure accountability, and manage risks related to AI-driven operations.

4.3.1 How Each Country Handles Liability for AI-Driven Systems and the Legal Personality of AI

Nigeria and the USA handle liability for AI-driven systems differently, reflecting their regulatory maturity. Nigeria's Data Protection Act 2023 lacks specific provisions on AI liability, leaving gaps in accountability when AI-driven systems fail or cause harm (Owolabi, 2023). Conversely, the USA, though still evolving, addresses liability through sector-specific regulations such as HIPAA in healthcare, where data protection and liability are clearer (Calo, R, 2015). However, neither country has fully addressed the concept of AI's legal personality, raising questions about accountability when

AI systems operate autonomously. Comprehensive frameworks are necessary to clarify liability in both nations (Godwins, O. P., et al, 2024).

4.4 AI's Impact on Innovation and Regulatory Flexibility

AI has been a significant catalyst for innovation across multiple sectors, enhancing efficiency, decision-making, and economic growth. In countries like the USA, sector-specific regulations such as the California Consumer Privacy Act (CCPA) and HIPAA encourage innovation while addressing privacy and data protection concerns as represented in figure 5. However, regulatory fragmentation can sometimes slow innovation as businesses navigate inconsistent standards across industries (Owolabi, 2023). In Nigeria, the limited scope of the Data Protection Act 2023 stifles AI-driven innovation by not fully addressing AI-specific issues like algorithmic accountability and liability. Regulatory flexibility is essential to allow businesses to adopt AI while ensuring ethical and legal compliance (Ijiga, A. C., et al, 2024). By establishing more adaptive regulations, both countries can promote responsible AI development while maintaining their competitive edge in global innovation (Reed & Grieman, 2023).

Figure 5 illustrates the profound impact AI has on innovation, emphasizing four key areas: improved decision-making, efficiency through automation, productivity gains, and personalized services. AI acts as a catalyst for innovation across various sectors, streamlining processes and enhancing economic growth. By automating routine tasks, AI increases operational efficiency, enabling organizations to focus on more strategic objectives. Improved decision-making powered by AI allows businesses to analyze vast amounts of data rapidly, resulting in more accurate predictions and insights. Additionally, AI fosters personalized services, tailoring experiences to individual needs, further boosting consumer satisfaction and business growth. However, the rapid evolution of AI requires regulatory flexibility to address ethical, legal, and societal challenges without stifling innovation. Governments must create adaptive frameworks that encourage responsible AI development while safeguarding against risks like bias, transparency, and data privacy concerns.

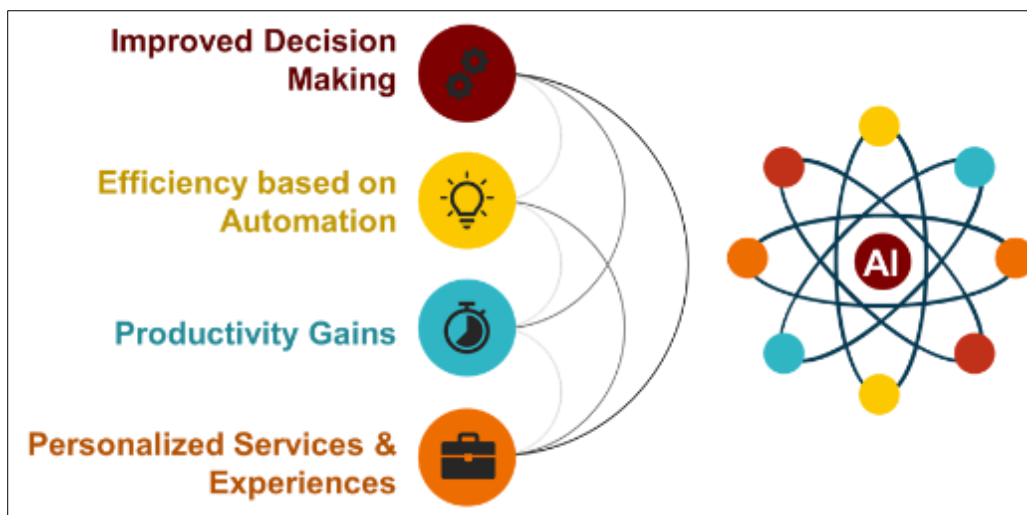


Figure 5 Impact of AI on Economy and Employment. (Abhinav, P. 2024)

4.4.1 Comparison of How Regulations in Nigeria and the USA Affect AI-Driven Innovation and Business Practices

Regulations in Nigeria and the USA impact AI-driven innovation and business practices differently. In Nigeria, the lack of comprehensive AI-specific regulations, such as in the Data Protection Act 2023, creates uncertainty for businesses, limiting large-scale AI investments and innovation (Owolabi, 2023) as represented in figure 6. Companies are hesitant to fully adopt AI technologies without clear legal frameworks, fearing liability issues. Conversely, the USA's sectoral approach, with regulations like the California Consumer Privacy Act (CCPA), offers more clarity, fostering an environment where businesses can innovate, though some industries feel constrained by stringent privacy laws (Papyshev & Yarime, 2023). Striking a balance between innovation and regulation remains essential in both countries.

Figure 6 compares how AI regulations in Nigeria and the USA influence innovation and business practices. Nigeria's regulatory environment, centered around the Data Protection Act 2023, lacks comprehensive AI-specific provisions, leading to uncertainty and slower adoption of AI technologies in businesses (Idoko, D. O., et al, 2024). In contrast, the USA's sectoral regulations, such as CCPA and HIPAA, offer clearer guidelines that foster AI innovation in specific

industries like healthcare and finance. However, the USA's fragmented regulatory landscape can cause inconsistencies. The diagram visually illustrates how these differing regulatory approaches affect AI-driven innovation and business practices in each country.

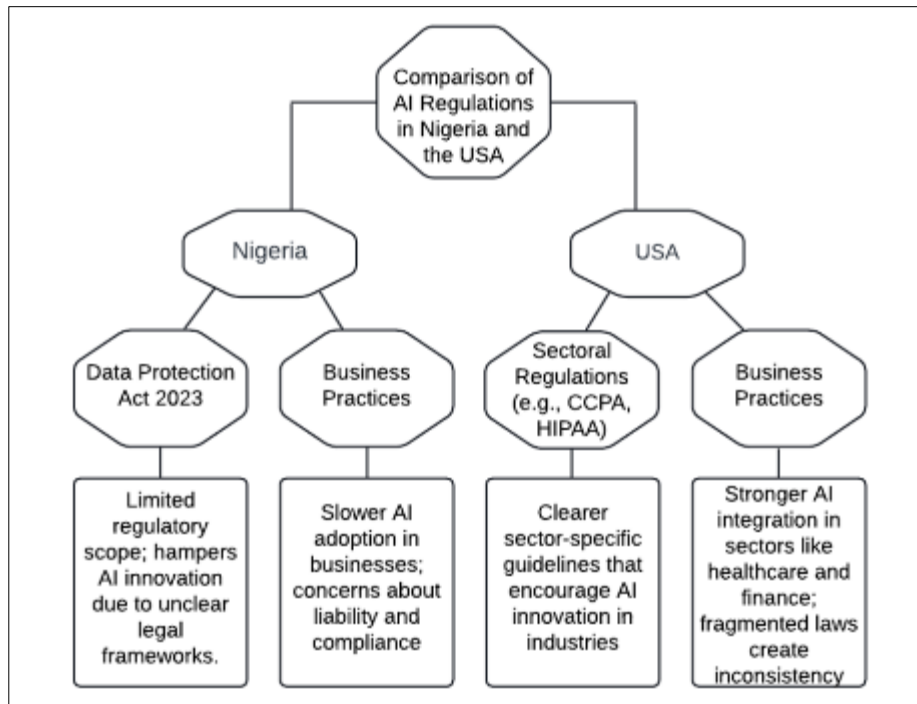


Figure 6 Comparison of AI Regulations in Nigeria and the USA

Figure 6 compares how AI regulations in Nigeria and the USA influence innovation and business practices. Nigeria's regulatory environment, centered around the Data Protection Act 2023, lacks comprehensive AI-specific provisions, leading to uncertainty and slower adoption of AI technologies in businesses. In contrast, the USA's sectoral regulations, such as CCPA and HIPAA, offer clearer guidelines that foster AI innovation in specific industries like healthcare and finance. However, the USA's fragmented regulatory landscape can cause inconsistencies. The diagram visually illustrates how these differing regulatory approaches affect AI-driven innovation and business practices in each country.

5 Challenges and Opportunities in AI Regulation

5.1 Challenges Unique to Nigeria's Regulatory Landscape

Nigeria's regulatory landscape for AI faces several unique challenges, primarily due to its nascent stage of AI development and enforcement. The country lacks a comprehensive legal framework that addresses the complexities of AI technologies, leaving key areas such as algorithmic accountability, bias, and transparency unregulated (Owolabi, 2023). Additionally, there is a significant gap in technical expertise among regulators, making it difficult to enforce existing regulations, such as the Data Protection Act 2023. Another critical issue is the limited resources and infrastructure available to implement effective AI governance, which hampers both regulatory oversight and industry compliance (Papsyshev & Yarime, 2023). Furthermore, AI's potential to transform sectors such as healthcare and finance is limited by the slow pace of regulatory reform, creating a cautious business environment where innovation is stifled due to unclear legal obligations. Addressing these challenges is essential for Nigeria to fully harness AI's benefits.

5.1.1 Issues such as Enforcement, Infrastructure, and Capacity Building

Enforcement, infrastructure, and capacity building are critical issues hindering the effective regulation of AI in Nigeria. While the Data Protection Act 2023 outlines key provisions for data governance, its enforcement remains weak due to the lack of technical expertise and inadequate resources among regulators (Owolabi, 2023). Infrastructure limitations, particularly in rural areas, further complicate the implementation of AI technologies, making it difficult for businesses to comply with regulatory standards (Enyejo, J. O., et al, 2024). Moreover, there is an urgent need for capacity building

initiatives to train regulators and industry professionals on AI governance, which would strengthen the country’s regulatory framework (Reed & Grieman, 2023).

5.2 Challenges in the USA’s Regulatory Landscape

The regulatory landscape for AI in the USA, while more developed than in many countries, faces significant challenges. One of the primary issues is the fragmented approach to regulation, where sector-specific laws like the California Consumer Privacy Act (CCPA) and HIPAA govern AI applications in different industries but lack a unified federal framework (Owolabi, 2023). This creates inconsistencies and confusion, especially for businesses operating across multiple sectors. Additionally, the rapid pace of AI development often outstrips the ability of regulators to create and implement timely legislation, leaving gaps in accountability and ethical oversight (Papsyshev & Yarime, 2023). Moreover, balancing innovation with consumer protection remains a critical challenge. As AI continues to evolve, regulators must find ways to protect data privacy and mitigate risks while not stifling technological progress. Addressing these challenges requires coordinated efforts between the government and private sectors (Enyejo, J. O., et al, 2024).

5.2.1 Balancing Innovation with Regulation, Particularly in Sectors Like Defense and Healthcare

Balancing innovation with regulation in sectors like defense and healthcare presents a critical challenge for AI governance in the USA. In defense, AI-driven technologies such as autonomous weapons and cybersecurity tools require rapid innovation to maintain national security, yet they also raise ethical and legal concerns that demand strict regulatory oversight (Owolabi, 2023). Similarly, in healthcare, AI’s potential to improve diagnostics and patient care is tempered by privacy and liability issues, as regulated by HIPAA. Achieving this balance requires a regulatory framework that fosters innovation while ensuring safety, accountability, and ethical standards (Reed & Grieman, 2023).

5.3 Opportunities for Improvement in Both Countries

Both Nigeria and the USA have significant opportunities for improving their AI regulatory frameworks. In Nigeria, expanding the scope of the Data Protection Act 2023 to address AI-specific concerns such as algorithmic transparency, bias, and accountability would create a more robust governance structure, promoting innovation while ensuring ethical AI development (Owolabi, 2023) as presented in table 6. Capacity building within regulatory bodies is essential to enforce these laws effectively. Additionally, fostering public-private collaboration could help bridge the gap between regulation and technological advancements (Atache, S., et al, 2024). In the USA, creating a unified federal AI regulatory framework would address the current fragmented approach, making it easier for businesses to navigate compliance across sectors (Papsyshev & Yarime, 2023). Further, updating sector-specific laws like HIPAA to account for AI-driven innovations in healthcare could enhance patient data protection while fostering innovation. Both countries would benefit from cross-border collaboration on best practices for AI governance, creating a global standard for responsible AI development (Owolabi, F. R. A., et al, 2024).

Table 6 Opportunities for Improvement in AI Regulation in Nigeria and the USA

Area of Improvement	Nigeria	USA	Key Recommendations
Comprehensive AI Regulation	Lacks AI-specific regulations beyond data protection	Fragmented, sector-specific laws (e.g., CCPA, HIPAA)	Develop unified AI regulation in both countries
Capacity Building	Needs training for regulators and institutions on AI governance	Requires continued development of regulatory expertise	Invest in AI education and regulatory capacity building
Collaboration	Limited collaboration between government and private sector	Stronger public-private partnerships, but room for improvement	Foster cross-sector collaboration in both countries
Global Harmonization	Alignment with international AI standards is still emerging	Some alignment, but lacks federal-level comprehensive standards	Collaborate globally for consistent ethical AI standards

5.3.1 *Potential Areas for Reform, Including Collaboration Between Regulatory Bodies and the Private Sector*

Potential areas for reform in both Nigeria and the USA include fostering stronger collaboration between regulatory bodies and the private sector. In Nigeria, regulatory frameworks like the Data Protection Act 2023 could benefit from partnerships with private AI developers to better understand the technical complexities and ensure that regulations promote both innovation and accountability (Owolabi, 2023). In the USA, a more cohesive approach involving industry stakeholders can bridge gaps between innovation and regulatory compliance, especially in sectors like healthcare and finance (Wachter et al., 2017). This collaboration can lead to more adaptive, forward-looking regulatory frameworks that keep pace with AI's rapid evolution.

6 The Role of Ethics and Transparency in AI Regulation

6.1 Ethical Considerations in AI Development

Ethical considerations in AI development are critical to ensuring that the technology serves society's interests while minimizing harm. AI systems, if not properly designed, can perpetuate bias, invade privacy, and lack accountability, raising significant ethical concerns as represented in figure 7. In Nigeria, where AI regulations are still emerging, the Data Protection Act 2023 only partially addresses these ethical challenges, particularly around issues like algorithmic bias and decision-making transparency (Owolabi, 2023). The USA, despite its sectoral approach, also faces ethical dilemmas, especially in healthcare and criminal justice, where biased AI algorithms can lead to unfair treatment or outcomes (Wachter et al., 2017). There is a growing consensus that AI developers and regulators must work collaboratively to create systems that are transparent, accountable, and designed with ethical principles at their core. Global standards for responsible AI development, including fairness, non-discrimination, and respect for privacy, are crucial to addressing these challenges (Ibokette., A. I., et al, 2024).

6.1.1 *Ethical Challenges in AI, Including Bias, Accountability, and Transparency*

Ethical challenges in AI development, particularly around bias, accountability, and transparency, are significant concerns for regulators and developers alike. AI systems often replicate biases present in training data, leading to unfair or discriminatory outcomes, especially in sensitive sectors like healthcare and criminal justice (Owolabi, 2023). Accountability is another challenge, as it is unclear who is responsible when AI-driven decisions cause harm—whether it is the developer, user, or data provider. Transparency is equally critical, as opaque AI algorithms make it difficult for stakeholders to understand decision-making processes. These challenges underscore the need for robust, ethically-driven frameworks for AI governance (Binns, 2018).

Figure 7 presents "Ethical Considerations in AI Development" as the central focus, with four key branches: Algorithmic Bias, Accountability, Transparency, and Privacy. Each branch addresses a critical ethical concern in AI development, with specific sub-points highlighting the challenges and solutions. For instance, algorithmic bias requires ensuring fairness, while transparency emphasizes the need for clear visibility into how AI decisions are made. Accountability focuses on defining liability for AI-driven outcomes, and privacy ensures user data protection in AI models. The diagram visually conveys how each of these considerations plays a role in responsible AI governance.

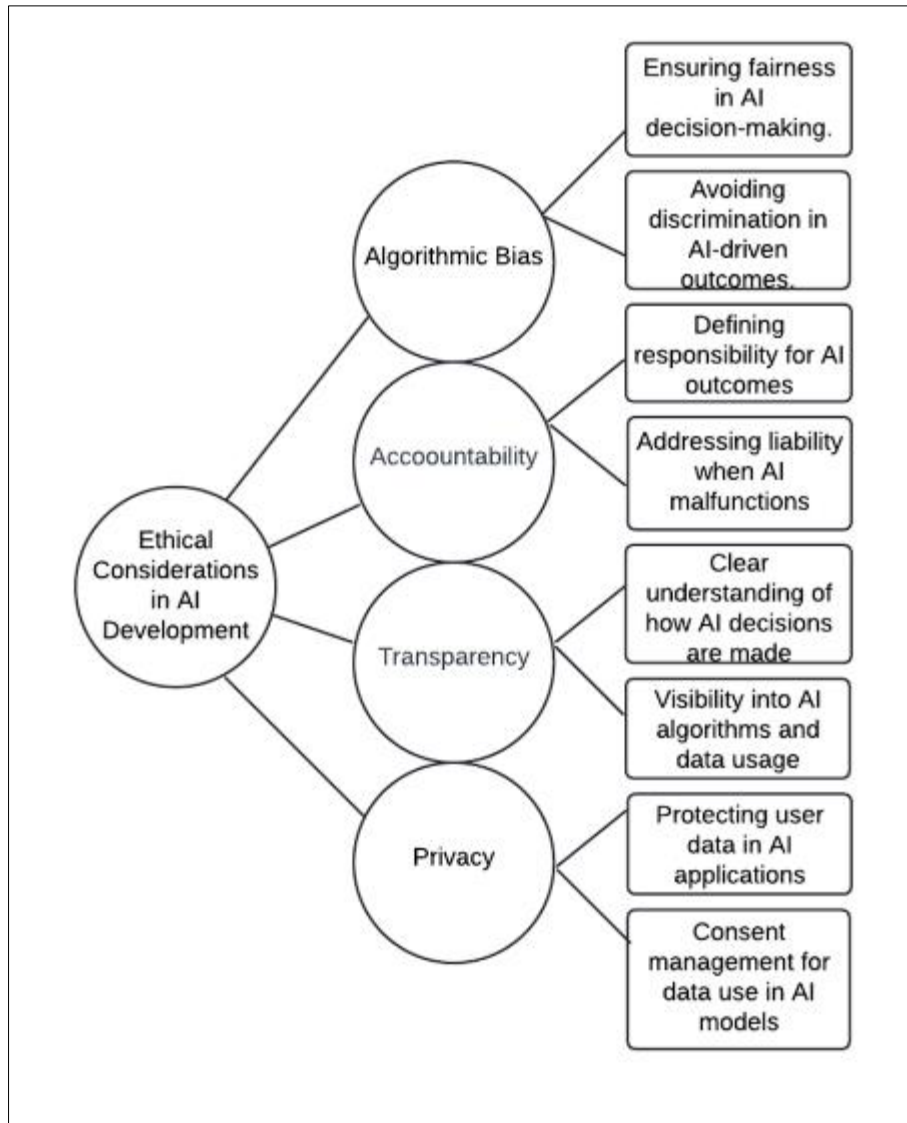


Figure 7 Ethical Considerations in AI Development

6.2 Ethics in Nigeria's AI Regulatory Framework

Nigeria's AI regulatory framework, though evolving, faces considerable challenges in addressing ethical issues such as transparency, bias, and accountability. The Data Protection Act 2023 provides a foundation for data governance but lacks comprehensive provisions on AI-specific ethical concerns, especially in sectors where AI-driven decisions impact human lives, like healthcare and finance (Owolabi, 2023). Issues such as algorithmic bias and the lack of transparency in AI systems are significant concerns, as AI may unintentionally perpetuate existing social inequalities. Furthermore, Nigeria's regulatory framework does not yet have strong accountability mechanisms for AI developers or users when AI systems malfunction or cause harm.

To address these gaps, Nigeria needs to develop AI-specific ethical guidelines that promote fairness, accountability, and transparency. Collaboration between regulatory bodies, private sector AI developers, and global best practices will be essential for Nigeria to build a robust, ethically sound AI governance model (Binns, 2018; Wachter et al., 2017).

6.2.1 Addressing Ethical Challenges in AI Use and Regulation Through the Data Protection Act 2023

The Data Protection Act 2023 attempts to address some ethical challenges in AI regulation in Nigeria, particularly around data privacy and consent. However, the Act falls short in tackling key issues such as algorithmic bias, lack of transparency in AI decision-making, and accountability for AI-driven outcomes (Owolabi, 2023) as presented in table 7. While the Act lays the groundwork for regulating data protection, it needs to expand its scope to include AI-specific

ethical concerns. Incorporating provisions that promote fairness, accountability, and transparency in AI systems would significantly strengthen Nigeria's ability to govern the ethical use of AI (Reed & Grieman, 2023).

Table 7 Addressing Ethical Challenges in AI Use and Regulation Through the Data Protection Act 2023

Ethical Challenge	Data Protection Act 2023 Provisions	Current Limitations	Recommendations for Improvement
Algorithmic Bias	General data privacy provisions	No specific guidelines on AI bias prevention	Introduce AI-specific regulations to mitigate bias
Transparency in AI Decisions	Requires data transparency for users	Lacks specific mandates for AI decision-making transparency	Create transparency requirements for AI algorithms
Accountability	Holds data controllers accountable for data misuse	No clear provisions for AI-driven decisions and liability	Define accountability for AI developers and users
Ethical Use of AI	Promotes ethical data use	Lacks comprehensive guidelines on ethical AI practices	Establish comprehensive ethical guidelines for AI use

6.3 Ethics in the USA's AI Regulatory Framework

The USA's AI regulatory framework, though more advanced than in many countries, still faces significant ethical challenges. Sector-specific regulations, such as the California Consumer Privacy Act (CCPA) and the Health Insurance Portability and Accountability Act (HIPAA), address privacy concerns but lack comprehensive provisions on issues like algorithmic transparency, bias, and accountability (Owolabi, 2023). In particular, AI-driven systems in healthcare and criminal justice have been criticized for perpetuating existing societal biases, raising concerns about fairness and non-discrimination (Idoko, D. O., et al, 2024). Additionally, the USA lacks a federal framework that mandates ethical standards across all AI systems, leading to inconsistencies in how ethical concerns are handled across industries (Wachter et al., 2017).

Addressing these ethical challenges will require a coordinated effort between regulators, industry stakeholders, and civil society to create a unified regulatory approach that emphasizes fairness, accountability, and transparency in AI development and use (Binns, 2018).

6.3.1 How Ethical Standards Are Embedded in AI Regulation in the USA (e.g., FTC Guidelines)

In the USA, ethical standards in AI regulation are embedded through sector-specific regulations and guidelines from agencies like the Federal Trade Commission (FTC). The FTC emphasizes fairness, transparency, and accountability in AI systems, particularly in how AI impacts consumers (Owolabi, 2023). These guidelines require AI systems to be designed in ways that prevent deceptive practices and ensure that algorithms do not perpetuate bias. However, the FTC's role is primarily advisory, and there is no unified federal AI law mandating ethical practices across all sectors. Further, cross-industry guidelines are needed to comprehensively address ethical concerns in AI (Reed & Grieman, 2023).

6.4 Transparency and Public Trust

Transparency is a fundamental element in building public trust in AI systems. The opacity of AI algorithms, particularly in decision-making processes, poses significant challenges for stakeholders who may not fully understand how outcomes are generated (Owolabi, 2023). In both Nigeria and the USA, a lack of transparency in AI systems can erode public trust, especially in sectors such as healthcare and finance where decisions can have life-altering consequences (Igba, E., et al, 2024). Regulatory frameworks must mandate transparency by requiring that AI developers disclose how their systems function, the data used, and potential biases.

In the USA, sector-specific regulations such as the California Consumer Privacy Act (CCPA) require some transparency, but broader federal standards are needed to ensure uniformity across industries (Binns, 2018). Meanwhile, Nigeria's Data Protection Act 2023 provides a starting point for data transparency, but more comprehensive provisions are necessary to establish AI transparency and build trust (Wachter et al., 2017).

6.4.1 *Importance of Transparency in Building Public Trust in AI Systems*

Transparency plays a pivotal role in fostering public trust in AI systems, particularly as these technologies are increasingly integrated into critical sectors such as healthcare, finance, and criminal justice (Awotiwon, B. O., et al, 2024). Without transparency, AI-driven decisions may appear arbitrary or biased, eroding public confidence in their fairness and accuracy (Owolabi, 2023). Ensuring that AI systems disclose how decisions are made and the data used in training these models can enhance accountability and prevent misuse. Regulatory frameworks that enforce transparency not only promote fairness but also encourage greater acceptance and trust from the public (Reed, 2023).

7 Conclusion and Policy Recommendations

7.1 Summary of Key Findings

This paper has highlighted the challenges and opportunities within AI regulatory frameworks in Nigeria and the USA. Nigeria's regulatory landscape, though improving with the Data Protection Act 2023, lacks comprehensive AI-specific provisions, especially in addressing critical ethical issues such as algorithmic bias, accountability, and transparency. The USA, while more advanced, relies on sector-specific regulations like the CCPA and HIPAA, which do not fully address AI's complexities across industries. Both countries face challenges in balancing innovation with robust governance. The paper underscores the need for Nigeria to expand its regulatory framework to encompass AI-specific challenges while strengthening enforcement and capacity-building initiatives. In the USA, a unified federal AI regulatory framework is necessary to overcome the fragmented nature of current regulations. Both nations can benefit from cross-sector collaboration and the establishment of global ethical standards to ensure responsible AI development and foster public trust.

7.1.1 *Recap of the Comparative Analysis Between Nigeria and the USA*

The comparative analysis between Nigeria and the USA reveals stark differences in their approaches to AI regulation. Nigeria's Data Protection Act 2023 provides a foundational framework for data privacy but lacks comprehensive AI-specific provisions, leaving significant gaps in addressing ethical and legal challenges. In contrast, the USA's regulatory landscape, though more mature, is fragmented, relying on sector-specific laws like the CCPA and HIPAA. This sectoral approach, while promoting innovation, leads to inconsistencies across industries. Both nations face challenges in achieving a balance between fostering AI innovation and ensuring robust governance and ethical standards in AI deployment.

7.2 Recommendations for Nigeria's AI Regulatory Framework

To strengthen Nigeria's AI regulatory framework, it is essential to expand the scope of the Data Protection Act 2023 to include AI-specific provisions. These should address critical issues such as algorithmic bias, transparency, accountability, and the ethical use of AI in sectors like healthcare and finance. Nigeria must invest in capacity building for regulatory bodies to ensure effective enforcement and oversight. Additionally, fostering collaboration between the government, private sector, and academic institutions can help bridge technical gaps and promote innovation. Introducing clear guidelines for AI developers and users will further ensure that AI technologies are deployed responsibly, while maintaining public trust and promoting economic growth. Establishing a comprehensive, adaptable framework will help Nigeria stay competitive in the evolving global AI landscape.

7.2.1 *Policy Recommendations for Strengthening Nigeria's AI Regulation, Including Legal Reforms and Capacity Building*

Strengthening Nigeria's AI regulation requires comprehensive legal reforms and robust capacity-building initiatives. First, the Data Protection Act 2023 should be expanded to address AI-specific concerns such as algorithmic fairness, transparency, and liability. Clear guidelines for AI developers and users are crucial to ensuring ethical AI use across sectors. Additionally, capacity-building programs for regulatory bodies should be prioritized to improve technical expertise and enforcement capabilities. Collaboration between the government, academia, and private sector is essential for fostering innovation while ensuring that regulatory frameworks are adaptive to emerging AI challenges. This holistic approach will ensure responsible AI governance and sustainable development in Nigeria.

7.3 Recommendations for the USA's AI Regulatory Framework

To strengthen the USA's AI regulatory framework, a unified federal AI law should be introduced to address the current fragmentation caused by sector-specific regulations such as the CCPA and HIPAA. A comprehensive regulatory approach would provide consistent guidelines across industries, ensuring that ethical concerns such as algorithmic bias,

transparency, and accountability are uniformly addressed. Additionally, the framework should incorporate provisions that foster innovation while safeguarding consumer rights and privacy. Strengthening public-private collaboration can help align regulatory goals with technological advancements. Furthermore, updating existing laws to account for AI-specific challenges in sectors like healthcare and finance will promote responsible AI use. Establishing federal standards for AI will enhance regulatory clarity, mitigate risks, and foster public trust in AI technologies.

7.3.1 *Suggestions for Refining AI Regulation in the USA to Address Emerging Challenges*

To refine AI regulation in the USA, it is essential to develop a cohesive federal framework that addresses emerging challenges such as algorithmic bias, data privacy, and accountability. Current sector-specific regulations should be updated to reflect AI's evolving role in industries like healthcare, finance, and defense. Introducing federal standards for ethical AI use, while allowing flexibility for technological innovation, will ensure that AI systems operate fairly and transparently. Increased collaboration between regulatory bodies, the private sector, and academic institutions is also necessary to continuously adapt regulations to AI advancements, promoting responsible AI growth while safeguarding public interests.

7.4 **Future Research Directions**

Future research should focus on developing comprehensive AI governance frameworks that address the unique ethical, legal, and societal challenges posed by AI. Comparative studies between nations, such as Nigeria and the USA, offer valuable insights into the effectiveness of different regulatory approaches. Researchers should explore the impact of AI on marginalized communities, investigating ways to mitigate biases in AI algorithms. Further studies should also focus on the intersection of AI and data privacy, exploring how emerging technologies can be regulated without stifling innovation. Additionally, research into AI accountability and liability will help define clearer responsibilities for AI developers and users. Ultimately, future research must support the creation of adaptive, forward-looking regulatory frameworks that promote both innovation and the ethical use of AI technologies across sectors.

7.4.1 *Areas for Further Research in AI Regulation, Focusing on Global Harmonization and Ethical AI Development*

Further research should prioritize the harmonization of AI regulations globally, ensuring that ethical standards are consistent across borders. This is crucial as AI technologies transcend national boundaries, raising concerns about differing regulatory standards. Research must explore frameworks that balance innovation with ethical principles such as fairness, transparency, and accountability. Additionally, studies should examine how to integrate these ethical considerations into AI development across industries while promoting global collaboration among regulators, tech companies, and researchers. Identifying best practices for creating AI governance models that are adaptable to local contexts while aligned with international standards is essential for fostering responsible AI growth.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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