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Assessing Cybersecurity Governance in Nigeria from Global Perspective: A Literature Review

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Abstract

Background: Nigeria's rapid digital transformation has led to increased cyber risks, endangering the country's security and stability. Although various policies and guidelines have been developed on cybersecurity, it is not yet clear how effective they are when compared to global benchmarks.
Aims: This literature survey compares cybersecurity governance in Nigeria with developed countries, identifies shortcomings and offers recommendations for improvement.
Methodology: Through qualitative data analysis, the study highlights weaknesses in laws and regulations, lack of cybersecurity awareness and training, corruption issues, infrastructure, housing shortages and poor economic integration. Comparing global practices with countries such as the UK, the US and Estonia, the study reveals that Nigeria lags behind in key areas such as law enforcement and the concept of work.
Finding: The recommendations include reforming the regulatory framework to respond to emerging threats, promoting stronger public-private partnerships, expanding awareness and training, and adopting Recognize global best practices in cybersecurity governance.
Conclusion: Improving these aspects will help Nigeria strengthen its ability to defend itself against evolving cyber threats and better align with global standards.

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Cyberspace Studies, Vol ?, No ?, ????

1. Introduction

The rise of digitalization and interconnected technologies has elevated cybersecurity governance to a critical global priority. Effective governance ensures the protection of digital infrastructure, personal data, and national security against a growing spectrum of cyber threats (ITU, 2023). Cybersecurity governance refers to the strategic framework and oversight mechanisms that organizations implement to align cybersecurity practices with their overall goals and objectives. It involves the establishment of policies, roles, responsibilities, and processes to manage cyber risks effectively. It ensures that an organization is prepared to identify, assess, and mitigate cyber threats while maintaining compliance with relevant regulations and standards (ibid). This paper's literature review provides a comprehensive overview of current research on cybercrime, highlighting national and global strategies, challenges, impacts, and possible directions for future research and effective solutions. In the digital era, robust cybersecurity governance is crucial for several reasons, such as meeting regulatory requirements, safeguarding sensitive information, and adapting to threats. The field of cybersecurity continuously evolves as new threats and vulnerabilities frequently emerge. A well-defined governance framework enables organizations to stay proactive and adapt to these changes, ensuring resilience against cyber threats (Grady, 2021).

The significance of cybersecurity in Nigeria cannot be overstated, especially as the digital landscape evolves at a rapid pace. Nigeria faces the same pressing concerns regarding cybersecurity as many other nations. It is essential for protecting data and digital infrastructure, combating cybercrime, and securing critical sectors (NITDA, 2021).

With technological advancements, these innovations are increasingly vulnerable to cyberattacks, making it imperative to establish strong cybersecurity frameworks that effectively protect consumer information and intellectual property (Adebayo & Abikoye, 2021). Developed economies like the United States, Singapore, and Estonia are at the forefront of global cybersecurity governance, setting a standard that Nigeria must strive to meet. Countries are ranked by the International Telecommunication Union (ITU) according to its Global Cybersecurity Index (GCI), which evaluates organizational, technological, legal, and collaborative measures. For example, Estonia has set international standards through its investments in technology and public awareness, as well as by incorporating cybersecurity into its national defense strategy. These nations demonstrate that resilience against cyber threats requires a proactive, multi-stakeholder approach (ITU, 2023). In contrast, Africa's cybersecurity governance faces significant challenges, including inadequate technological expertise, weak legal frameworks, and underdeveloped infrastructure (Yilma, 2023). As the largest economy in Africa, Nigeria is integral to the region's cybersecurity landscape. Despite the establishment of a legal

framework through the Cybercrime Act of 2015 to address cyber threats, effective implementation has been sporadic at best. However, there is hope on the horizon. Increased awareness and advanced technological capabilities are emerging, driven by organizations like the National Information Technology Development Agency (NITDA) and valuable collaborations with international partners.

This study is not merely an analysis; it is a call to action. By comparing Nigeria's cybersecurity governance with global best practices, we can uncover the challenges facing both national and regional strategies. It is time to strengthen our defenses and secure our digital future.

2. Methodology

This research investigates cybersecurity governance in Nigeria within the context of global frameworks. A comprehensive literature review identified existing information, significant trends, and gaps in current research.

2.1. Literature search strategy

We utilized three key academic databases Google Scholar, JSTOR, and IEEE Xplore to conduct extensive searches for relevant materials. These platforms were selected for their broad coverage of academic papers, official documents, and technical reports related to cybersecurity governance, with the search limited to English-language publications to ensure accessibility.

2.2. Search terms and Keywords

The search used specific keywords to ensure relevance. The main terms included "cybersecurity governance in Nigeria", "global cybersecurity frameworks", "cybersecurity policy in Nigeria", and "Nigeria's cybersecurity challenges". Boolean operators refined the search to find studies on these topics.

2.3. Inclusion and Exclusion criteria

The following criteria were applied for quality and relevance:

- **Inclusion.** Only peer-reviewed papers, official documents, and research from 2018 to 2024 were included for current sources.
- **Exclusion.** Non-English publications and studies unrelated to cybersecurity governance were excluded to maintain focus and coherence.

2.4. Organizational and Analytical approach

The material was arranged and examined using a methodical way. The database name, keywords, inclusion and exclusion criteria, number of recognized studies, and relevance were all tracked using a spreadsheet. Common themes, including the advantages and disadvantages of the

Cyberspace Studies, Vol ?, No ?, ????

governance systems in place, comparisons with international frameworks, difficulties encountered, and suggested remedies, were found using thematic analysis.

2.5. Credibility and Quality assessment

Peer review status, author qualifications, and possible funding source biases were used to evaluate the reliability of the sources. The methodological soundness and applicability of each study to the research issues were assessed.

2.6. Scope and Limitations

The research acknowledges that omitting non-English literature may present a limitation, as there could be significant studies available in local languages. Furthermore, concentrating on works published between 2018 and 2024 might result in overlooking important research from earlier years. Nonetheless, attempts were made to incorporate highly pertinent older studies when deemed necessary.

The systematic literature review methodology employed in this research establishes a solid foundation for comprehending cybersecurity governance in Nigeria. By following precise inclusion and exclusion criteria, making use of established databases, and applying rigorous analytical methods, this research enhances the growing body of knowledge regarding cybersecurity on a global scale. The results aim to guide policy and practice, emphasizing areas in need of enhancement and potential opportunities for international collaboration.

The literature review process was carried out systematically to ensure a comprehensive and impartial synthesis of the existing research. Below is a summary of the steps undertaken to review and synthesize the literature.

2.6.1. Limitations in available data and research gaps

The review of the literature concerning Nigeria's cybersecurity governance is thorough but may have some limitations and research deficiencies that could affect the results and interpretations. The following outlines these limitations:

a) Limited access to academic databases

- **Issue.** Access to full-text scholarly articles in premium databases (such as JSTOR and IEEE Xplore) may have been hindered by institutional or financial limitations. This could restrict the range of studies available for analysis.
- **Impact.** The omission of pertinent studies behind paywalls may lead to an incomplete understanding of cybersecurity governance in Nigeria.

b) Publication bias

- **Issue.** The review predominantly concentrated on peer-reviewed articles and government documents, possibly overlooking grey literature (such as industry reports and publications from non-governmental organizations).
- **Impact.** Grey literature frequently includes valuable practical insights and case studies that could enhance academic findings, but these were absent from the review.

c) Funding and resource constraints

- **Issue.** Numerous studies on cybersecurity in Nigeria may be sponsored by particular organizations or government entities, which could introduce biases concerning research focus or outcomes.
- **Impact.** The reliance on funded studies may result in a distorted representation of issues, as research might emphasize areas of interest to the funders rather than addressing widespread concerns.

d) Reliance on secondary data

- **Issue.** The review is based on secondary data derived from existing studies, which may not accurately represent the current landscape of cybersecurity governance due to rapid shifts in policies, technologies, and threats.
- **Impact.** The results may not completely reflect the latest developments in Nigeria's cybersecurity situation.

3. Theoretical review

The Institutional Theory is particularly suitable for the study "Comparative Assessment of Cybersecurity Governance in Nigeria from a Global Perspective". Because this theory provides a robust framework for examining how institutional structures, rules, norms, and practices influence the development and implementation of cybersecurity governance in Nigeria compared to global standards.

3.1. Background

Institutional theory is particularly important for the study of comparative analysis of Nigeria's cybersecurity governance from an international perspective because the theory provides a strong foundation for examining how institutional structures, policies, standards, and practices affect the development and implementation of cybersecurity governance in Nigeria when compared to the world of global standards. Applying these theories to Nigeria's cybersecurity governance involves analyzing how regulatory compliance and institutional structures are established and enforced. Nigeria has made significant strides in establishing legal frameworks such as the Cybercrime Act of 2015 and the NITDA Act, which provide a foundation for cybersecurity governance. However, challenges such as

Cyberspace Studies, Vol ?, No ?, ????

implementation gaps and limited awareness hinder effectiveness. By leveraging regulatory compliance and institutional theory, Nigeria can enhance its governance structures to better align with global standards and improve its response to cyber threats.

Theoretical frameworks such as regulatory compliance and institutional theory provide valuable insights into the effectiveness of Nigeria's cybersecurity governance structures. By adhering to regulatory standards and ensuring that institutions are appropriately structured and resourced, Nigeria can strengthen its cybersecurity governance. This approach will not only enhance the country's ability to address cyber threats but also align its governance structures with global best practices, fostering a secure digital environment for economic growth and development.

3.2. Institutional theory

Institutional theory has its roots in sociology, organizational studies, and politics. It was originally designed to describe how an organization's structures and practices are affected by its environment, including culture, leadership, and management processes. The theory can be traced to the work of several scholars in the mid-20th century, with its modern form shaped by key contributors like John W. Meyer and Brian Rowan (1977), and Paul J. DiMaggio and Walter W. Powell (1983). Each contributed distinct perspectives that helped institutional theory evolve into a comprehensive framework for analyzing institutional influences on organizations.

Their contributions provided unique insights that shaped organizational theory into a comprehensive framework for analyzing the influence of institutional factors on organizations. Institutional theory examines how organizational structures and processes are shaped by their environment, including legal and regulatory frameworks. This theory is particularly relevant in understanding how institutions such as the National Information Technology Development Agency (NITDA) in Nigeria are structured and function in addressing cybersecurity threats. According to Jones (2017), institutional theory helps analyze how organizations adapt to their regulatory environments to ensure compliance and effectiveness. In the context of Nigeria, institutional theory can provide insights into how regulatory bodies like NITDA are structured to handle cybersecurity threats and how they adapt to the evolving cyber landscape.

3.2.1. Key contributors to Institutional Theory

a) **John W. Meyer and Brian Rowan**. In their foundational 1977 work, Meyer and Rowan emphasized how organizations adopt formal structures and practices not solely for efficiency but to gain legitimacy within their institutional environment. They argued that formal rules often function as "myths", which

organizations ceremonially conform to, even if they are not fully implemented in practice.

b) **Paul J. DiMaggio and Walter W. Powell**. In 1983, DiMaggio and Powell expanded on Meyer and Rowan's work by introducing the concept of institutional isomorphism, explaining why organizations within the same field tend to become similar over time. They identified three mechanisms driving this process:
   - **Coercive isomorphism.** Resulting from formal pressures such as regulations.
   - **Normative isomorphism.** Stemming from professional norms and standards.
   - **Mimetic isomorphism.** Emerging from uncertainty, where organizations imitate successful models.

3.2.2. Explanation of Institutional Theory

Institutional theory posits that organizations are influenced not only by economic and technical imperatives but also by social, cultural, and institutional contexts. It explains how organizations:

- **Adopt structures for legitimacy**. Organizations often conform to societal norms, legal requirements, and professional expectations to enhance their legitimacy, even if these practices do not improve efficiency (Meyer & Rowan, 1977).
- **Respond to institutional pressures**. External pressures, such as regulatory mandates, societal expectations, and industry trends, shape organizational behaviors and governance practices (DiMaggio & Powell, 1983).
- **Adapt over time**. Institutional theory also explores how organizations evolve through a process of institutionalization, where certain practices become ingrained and taken for granted within a specific field (Tolbert & Zucker, 1996).

3.2.3. Why Institutional Theory?

- **Focus on organizational structures and practices**. Institutional theory emphasizes how formal structures, policies, and informal norms shape governance. It can help analyze how Nigeria's cybersecurity institutions (e.g., government agencies, regulatory bodies, and private sector organizations) align or diverge from global practices.
- **Examination of external pressures**. This theory is useful for understanding the influence of external pressures, such as international agreements, global norms, and the practices of more developed countries, on Nigeria's cybersecurity policies and frameworks. For example, how does Nigeria respond to global conventions like the Budapest Convention on Cybercrime or the African Union's Malabo Convention?

Cyberspace Studies, Vol ?, No ?, ????

- **Adaptation and legitimacy**. Institutional theory also explores how countries adapt governance practices to gain legitimacy in the global arena. This perspective can explain Nigeria's efforts to implement global cybersecurity standards and the challenges in localizing them within its unique socio-economic and political context.
- **Comparative analysis across institutions**. The theory supports cross-national comparisons, enabling an examination of the structural differences and similarities between Nigeria and developed countries. It provides insights into why some global practices succeed in Nigeria while others do not, based on institutional readiness and socio-political factors.
- **Multi-stakeholder perspectives**. Institutional theory accounts for the role of various actors, such as governments, international organizations, private sector entities, and civil society. This is crucial for cybersecurity governance, which relies on a multi-stakeholder approach.

3.2.4. Application of Institutional Theory to the study

1. **Understanding institutional context in Nigeria.** Institutional theory emphasizes the role of historical, social, and political contexts in shaping governance structures (Scott, 2004). In Nigeria, the foundational cybersecurity governance structure is anchored on the Cybercrimes (prohibition, prevention, etc.) Act of 2015, which serves as the legal basis for addressing cyber threats. However, compared to international frameworks like the Budapest Convention, Nigeria's laws are often criticized for their lack of comprehensiveness in enforcement and international collaboration (Adeoye & Balogun, 2018). Economic and technological constraints further limit the country's capacity to adopt global best practices (North, 1991).
2. **Analyzing Institutional Pressures.** Institutional theory identifies three types of pressures— coercive, normative, and mimetic— that shape organizational and policy behaviors (DiMaggio & Powell, 1983).
   - **Coercive pressures**. Nigeria faces external pressures from international organizations like the International Telecommunication Union (ITU) to align its governance structures with global cybersecurity norms. For instance, the ITU's Global Cybersecurity Index serves as a benchmark for assessing Nigeria's cybersecurity readiness (Bello & Musa, 2022).
   - **Normative Pressures**. Professional bodies and societal expectations encourage Nigeria to adopt practices observed in developed nations, such as multi-stakeholder collaboration as

exemplified by the United States' NIST Cybersecurity Framework (Yoo et al., 2005).

- **Mimetic Pressures**. Nigeria often imitates cybersecurity models from developed nations, such as adopting the ISO/IEC 27001 framework for information security management to enhance legitimacy (Tolbert & Zucker, 1996).

3. **Explaining institutional gaps and challenges.** Institutional theory explains why certain governance structures underperform in specific contexts due to weak institutional mechanisms or misalignment with local needs (Oliver, 1991). In Nigeria, inadequate enforcement mechanisms, corruption, and fragmented stakeholder collaboration hinder the implementation of cybersecurity policies (Adeoye & Balogun, 2018). Furthermore, many global frameworks fail to address Nigeria's unique socio-economic realities, such as limited digital literacy and infrastructure deficits, highlighting the need for localized adaptations (Meyer & Rowan, 1977).
4. **Comparative analysis with developed countries.** Institutional theory facilitates a systematic comparison of cybersecurity governance between Nigeria and developed countries by examining institutional isomorphism (DiMaggio & Powell, 1983). Developed countries typically exhibit robust institutional frameworks characterized by seamless coordination among stakeholders and strong enforcement mechanisms. In contrast, Nigeria displays partial isomorphism, where global frameworks are adopted but not fully internalized or operationalized due to weak institutional capacity (Scott, 2004). Differences in funding, technical expertise, and digital infrastructure further exacerbate Nigeria's governance challenges (Kalu & Nwoke, 2020).
5. **Strategies for institutional improvement.** Institutional theory offers insights into strategies for strengthening Nigeria's cybersecurity governance.
   - **Coercive mechanisms**. Nigeria should enhance enforcement of existing laws and ratify international agreements like the Budapest Convention to benefit from global cooperation (Adeoye & Balogun, 2018).
   - **Normative capacity-building**. Training programs for public and private sector actors can promote a cybersecurity culture and align Nigeria with global best practices (Wijen & Ansari, 2007).
   - **Localized mimetic practices**. Nigeria should avoid indiscriminate imitation of global frameworks and instead adapt them to its unique socio-political context to ensure relevance and sustainability (Suchman, 1995).

Cyberspace Studies, Vol ?, No ?, ????

4. Literature review

Cybersecurity governance includes processes, policies and procedures designed to protect digital infrastructure, ensure data security and prevent cyber threats. Good governance internationally is based on international standards such as the Budapest Convention on Cybercrime and ISO/IEC 27001. Data shows that Nigeria has made progress in cybersecurity governance, particularly with the implementation of the National Cybersecurity and Policy Act. However, challenges remain, including weak governance, poor performance, limited cross-border cooperation and a lack of interest in new technologies. Comparative views from developing countries reveal best practices that can guide policy development in Nigeria. Resolving these conflicts requires a comprehensive approach that integrates legal, operational and administrative mechanisms, promotes public-private partnerships, and strengthens regional and international cooperation.

5. Historical context and development of cybersecurity in Nigeria

5.1. Background of cybersecurity in Nigeria

The evolution of cybersecurity in Nigeria can be traced through several key milestones that reflect the country's growing awareness of cyber threats and its efforts to establish a robust cybersecurity framework. This section provides a historical overview of cybersecurity development in Nigeria, supported by relevant literature and official documents.

a) Early days of internet adoption (1990s–2000s)

The advent of the internet in Nigeria during the late 1990s marked the beginning of a new era of connectivity. However, this rapid adoption also introduced new vulnerabilities and challenges. As internet usage grew, so did the prevalence of cybercrime, including email scams, identity theft, and financial fraud (Adeyinka, 2012). During this period, cybersecurity was not a priority for the Nigerian government or private sector, leading to a lack of formal policies and regulations to address emerging threats.

b) The Rise of Cybercrime (2000s–2010s)

By the early 2000s, Nigeria had gained notoriety for being the origin of various cybercrimes, particularly the "419 scam", a type of advanced-fee fraud that spread globally through email and other digital platforms. This reputation spurred both local and international pressure on the Nigerian government to take action (Smith, 2013). In response, the government began to recognize the need for a structured approach to cybersecurity.

c) Establishment of the National Information Technology Development Agency (NITDA)

In 2007, the Nigerian government established the National Information Technology Development Agency (NITDA) under the National Information Technology Development Act. NITDA was mandated to regulate and develop the information technology sector in Nigeria, including the promotion of cybersecurity. This marked the first significant step toward formalizing cybersecurity governance in the country.

d) The Cybersecurity Act of 2015

The passage of the Cybersecurity Act in 2015 was a critical milestone in Nigeria's cybersecurity history. The Act established a legal framework for the protection of computer systems and critical national infrastructure, and it introduced penalties for cybercrime offenses (Federal Republic of Nigeria, 2015). The Act also recognized the importance of international cooperation in combating cybercrime.

e) Development of the National Cybersecurity Policy (2017)

Building on the Cybersecurity Act, the Nigerian government launched the National Cybersecurity Policy in 2017. This policy aimed to create a safer and more secure cyberspace for Nigerians by addressing key issues such as cybercrime, data protection, and privacy (NITDA, 2017). The policy also emphasized the need for public-private partnerships in cybersecurity efforts.

f) Amendment of the NITDA Act (2021)

In 2021, the Nigerian government amended the NITDA Act to strengthen the agency's regulatory powers and expand its scope to include emerging issues such as data protection and digital economy governance (NITDA, 2021). This amendment was seen as a response to the growing importance of data in the digital age and the need for robust data protection laws.

g) Recent developments and Challenges

In recent years, Nigeria has continued to enhance its cybersecurity framework, including the establishment of the Nigerian Cybersecurity Committee (NCSC) to coordinate national efforts (NCSC, 2022). However, challenges such as limited awareness, insufficient funding, and the rapid evolution of cyber threats remain significant obstacles to effective cybersecurity governance in Nigeria (Adeyemi, 2022).

6. Current state of cybersecurity in Nigeria

Nigeria's cybersecurity landscape is marked by urgent challenges that call for immediate attention.

Cyberspace Studies, Vol ?, No ?, ????

6.1. Challenges

a) **Rising cybercrime.** The country is increasingly viewed as a hub for cybercriminals, with rising incidents of phishing, ransomware, and financial fraud, fueled by high internet penetration and economic difficulties.

b) **Inadequate infrastructure.** Many organizations lack the necessary resources and skilled personnel to implement effective cybersecurity measures, leaving them exposed to attacks.

c) **Legislation gaps.** Although laws like the Cybercrimes Act of 2015 have been established, enforcement remains a challenge, necessitating stronger implementation to protect our digital environment.

d) **Public awareness.** The general public's knowledge of cybersecurity recommended practices and threats is typically lacking. Many people and companies do not place a high priority on cybersecurity, which leaves them open to assaults.

6.2. Advancements

a) **Government Initiatives.** To enhance cybersecurity, the Nigerian government has established the National Cybercrime Cosultative Committee (NCCC) and the National Cybersecurity Policy and Strategy. The goal of these programs is to improve cooperation between the public and corporate sectors as well as civic society.

b) **International Collaboration.** Nigeria is increasingly collaborating with international organizations to enhance its cybersecurity capabilities. Partnerships with agencies like INTERPOL and other countries help in sharing best practices and intelligence.

c) **Capacity Building.** Educational institutions and organizations are starting to offer more training and certification programs in cybersecurity, increasing the number of professionals skilled in this field.

6.3. Future prospects

The future of cybersecurity in Nigeria relies on key factors:

a) **Increased investment.** Both public and private sectors must significantly increase investments in cybersecurity technologies and training to build a strong defense against threats.

b) **Stronger policies.** Comprehensive and enforceable legislation is essential for effectively combating cybercrime and deterring offenders.

c) **Public engagement.** Raising awareness of cybersecurity risks and safe practices among citizens and businesses is crucial for fostering a secure digital landscape.

6.4. Comparative analysis

Global Cybersecurity Governance Frameworks:

1. NIST Cybersecurity Framework (USA),
2. ISO/IEC 27001 (International),
3. General Data Protection Regulation (GDPR) (EU),
4. Cybersecurity and Infrastructure Security Agency (CISA) (USA),
5. National Institute of Standards and Technology (NIST) Privacy Framework (USA).

6.5. Importance of analyzing Nigeria in the context of global trends

1. Understanding global best practices,
2. Addressing unique challenges,
3. Facilitating international collaboration,
4. Enhancing national security and economic growth,
5. Staying ahead of emerging threats,
6. Promoting digital inclusion and development.

7. Empirical review

This analysis examines cybersecurity governance in Nigeria from a global perspective, specifically evaluating the effectiveness of Nigeria's cybersecurity framework in relation to international standards. The empirical research sheds light on the obstacles, advancements, and advantages of regulatory measures, partnerships between the public and private sectors, and the alignment of institutions in the field of cybersecurity. The study compiles findings from research conducted both in Nigeria and various other countries, emphasizes the relationship between data privacy and security practices, and explores Nigeria's position within the global cybersecurity domain. The National Cybersecurity Policy and Strategy (NCPS) serves as a protective measure for sensitive information. The proffered solution for enhancing the empirical review of Nigeria's cybersecurity laws involves a comprehensive approach to address identified gaps and challenges faced by regulatory agencies such as NITDA and NCC. Here is a structured summary of the solution:

a) **Agency effectiveness assessment**. Evaluate the operational capacity of NITDA and NCC by examining their funding, resources, and personnel skills to determine if they are adequately equipped to enforce cybersecurity regulations.

b) **Role clarity and Legal authority**. Assess the legal mandates and roles of these agencies to identify any overlaps or gaps that may hinder effective enforcement.

c) **Public awareness and Education**. Implement strategies to improve public understanding of cybersecurity through educational campaigns, enhancing compliance and awareness.

d) **Political and Economic considerations**. Investigate how political interference and economic priorities may influence the

Cyberspace Studies, Vol ?, No ?, ????

enforcement of cybersecurity laws.

e) Case studies and Practical insights. Analyze real-life scenarios where enforcement was challenging to gain insights into operational obstacles.

f) Collaboration and Technological adaptation. Strengthen inter-agency cooperation and ensure that the agencies keep pace with technological advancements to address emerging threats effectively.

g) Institutional environment analysis. Examine the internal structures and processes within NITDA and NCC to identify structural barriers to effective regulation.

Additional relevant studies supporting this claim are summarized in Table 1.

8. Gaps in the literature

Despite substantial research efforts, critical gaps remain in the literature concerning Nigeria's cybersecurity governance, particularly when compared to global standards. These gaps underscore the need for a more holistic and integrated understanding that incorporates legal, technical, and organizational dimensions, as well as insights from international best practices as well as others listed below:

1. Fragmented focus across dimensions;
2. Overlaps and inefficiencies in governance;
3. Insufficient private-sector involvement;
4. Absence of standardized incident response plans;
5. Weak enforcement mechanisms;
6. Low cybersecurity awareness;
7. Emerging technologies.

9. Summary of findings

The following is the summary of the findings:

1. Nigeria's cybersecurity governance is still in the early stages of development and grapples with numerous implementation obstacles. In contrast, countries like the UK, the US, and Estonia have well-established and sophisticated cybersecurity policies.
2. Cyber threats such as ransomware, phishing, and attacks on infrastructure are prevalent.
3. Global strategies for mitigation can offer frameworks that Nigeria might adopt to bolster its defenses.
4. Public-private partnerships (PPPs) are vital for improving cybersecurity resilience in more developed nations. However, Nigeria's efforts in this domain are still maturing. Regulatory bodies are crucial to cybersecurity governance.
5. Nigeria needs to enhance its enforcement capabilities, boost awareness initiatives, and refine its compliance mechanisms.

Table 1. Journal Review

S/N	Authors & Year	Topic of research	Methodology used	Findings and Conclusion	Recommendations	DOI / Journal
1	Adamu & Ogundele (2023)	Case-control analysis of cyber incidents in Nigeria and Estonia	Case-control study; comparative analysis	Nigeria faces higher cyber incidents due to weaker enforcement; Estonia has a more resilient cybersecurity framework.	Strengthen Nigeria's cyber incident response and enforcement mechanisms.	*Journal of Cybersecurity*
2	Adamu & Ogundele (2023)	Cross-border cyber threats and Nigeria's cybersecurity frameworks	Empirical analysis; policy review	Nigeria's cybersecurity framework lacks coordination against cross-border cyber threats.	Enhance international cooperation and cross-border threat intelligence sharing.	*African Journal of Cyber Policy*
3	Adebanjo & Abikoye (2023)	Digital forensics in regional cybersecurity	Qualitative analysis; case studies	Digital forensic practices in Africa are underdeveloped compared to global standards.	Invest in training and infrastructure for digital forensics.	*Journal of Cybersecurity Studies*
4	Adeoye & Adeoye (2021)	Data privacy and cybersecurity in Nigeria's healthcare sector	Empirical analysis; surveys	Healthcare institutions in Nigeria have significant cybersecurity vulnerabilities.	Implement stronger data protection policies and cybersecurity training in healthcare.	*Journal of African Technology Studies*
5	Adeoye & Balogun (2018)	Enforcement challenges in Nigeria's cybersecurity laws	Legal review; qualitative interviews	Weak enforcement mechanisms limit the effectiveness of Nigeria's cybersecurity laws.	Strengthen cybersecurity law enforcement through better regulatory oversight.	https://doi.org/10.1080/23738871.2018.1824136
6	Adetuyi & Adeniran (2020)	Legal frameworks for cybersecurity in Nigeria: A comparative analysis with international standards	Comparative legal analysis	Nigeria's cybersecurity laws lag behind international best practices.	Align Nigeria's cybersecurity laws with global standards.	https://doi.org/10.1080/23738871.2020.1782136
7	McDowe	Approaches to	Efforts for	Focus on broader	Further review	https://doi.org/10.1

S/N	Authors & Year	Topic of research	Methodology used	Findings and Conclusion	Recommendations	DOI / Journal
	ll et al. (2014)	Network Security: OECD and ITU	cooperative network security	international cooperation efforts	recommended	007/978-3-642-37481-4_13
8	Kohnke & Shoemaker (2015)	Making Cybersecurity Effective	Information governance and System development	Cybersecurity governance effectiveness	Further review recommended	https://doi.org/10.1080/07366981.2015.1087799
9	Bello & Musa (2022)	Cybersecurity governance in Nigeria's digital economy: Challenges and opportunities	Policy analysis	Nigeria's cybersecurity governance is fragmented	Establish a centralized cybersecurity governance	https://doi.org/10.1080/23738871.2022.1934501
10	Buçaj & Idrizaj (2024)	The need for cybercrime regulation	Normative legal research	The study emphasizes on the urgent need for global cybercrime	A further review	https://doi.org/10.31893/multirev.2025024
11	ITU (2023)	Global cybersecurity index 2023	Quantitative assessment	Nigeria ranks low in global cybersecurity preparedness.	Increase investment in cybersecurity infrastructure and policy reforms.	https://doi.org/10.1007/s10207-023-00551-6
12	Kalu & Nwoke (2020)	Digital infrastructure and cybersecurity readiness in Nigeria	Quantitative & qualitative analysis	Nigeria's digital infrastructure lacks adequate cybersecurity readiness.	Strengthen cybersecurity frameworks and invest in digital resilience.	https://doi.org/10.1080/23738871.2020.1889120

S/N	Authors & Year	Topic of research	Methodology used	Findings and Conclusion	Recommendations	DOI / Journal
13	Mensah & Osei (2023)	Impact of data privacy regulations on cybersecurity investments	Case study	Ghana's data privacy regulations drive increased investment in cybersecurity.	Nigeria should adopt similar strategies to encourage cybersecurity investments.	*Telecom Policy in Africa*
14	Mwangi & Njenga (2023)	Cybersecurity incident trends in Kenya's financial sector post-data privacy regulations	Financial sector cybersecurity analysis	Post-data privacy regulations, cyber incidents have evolved in complexity.	Strengthen financial sector cybersecurity measures.	*East African Journal of Cybersecurity*
15	Lebogang et al. (2022)	Evaluating cybersecurity strategies in Africa	Evaluates national cybersecurity strategies	The paper evaluates national cybersecurity strategies in five African countries, including	Further review recommended	https://doi.org/10.4018/978-1-7998-8693-8.ch001
16	Okeke et al. (2023)	Tracking Nigeria's progress in African cybersecurity cooperation	Institutional analysis	Nigeria plays a key role in African cybersecurity cooperation but faces challenges.	Improve regional cybersecurity partnerships and execution strategies.	*International Journal of Cyber Governance*
17	Olowu et al. (2024)	Addressing emerging cybersecurity risks in Nigeria	Risk assessment	AI and IoT pose new security challenges for Nigeria.	Develop policies to regulate AI and IoT security risks.	*Journal of Emerging Technologies in Africa*

S/N	Authors & Year	Topic of research	Methodology used	Findings and Conclusion	Recommendations	DOI / Journal
18	Yusuf & Bello (2023)	Overlaps and inefficiencies in Nigeria's cybersecurity governance	Institutional analysis	Multiple agencies create inefficiencies in Nigeria's cybersecurity governance.	Streamline and unify Nigeria's cybersecurity agencies for better efficiency.	*West African Cybersecurity Journal*
19	Kudella (2023)	The POPIA 7th Condition Framework for SMEs in Gauteng	The methods used in this paper include a literature review, framework development, qualitative analysis	Investigation of Protection of Private Information Act (POPIA), known as the Security and Safeguards, and found that organizations affected are unable to implement the POPIA without a technical guide and framework.	These findings collectively highlight the challenges and opportunities for SMEs in navigating data privacy regulations.	https://doi.org/10.1007/978-981-19-7346-8_72
20	Esquibel & Aten (2023)	Building resilience in critical infrastructure through Public-Private Partnerships: An exploration of referent organization and their influence	Qualitative, multi-case study approach. Analysis of pre-partnership activities and formation processes.	The paper emphasizes that (PPPs) are essential for enabling critical infrastructure cybersecurity,	Partnerships, which can lead to enhanced resilience and innovative developments in	https://doi.org/10.1109/rws58133.2023.10284614

10. Conclusion

In response to cyber threats, Nigeria's governance in cybersecurity has seen advancements; however, it continues to encounter difficulties in aligning with global best practices. The country has enacted legislative measures such as the National Cybercrime Policy and Strategy (NCPS) and the Cybercrime Act of 2015, but the application and enforcement of these laws fall short of international criteria.

To improve cybersecurity governance, Nigeria must enhance its institutional capabilities, encourage private-sector participation, and strengthen public-private partnerships. The Nigerian Communications Commission (NCC) and the National Information Technology Development Agency (NITDA) are crucial in ensuring adherence to cybersecurity regulations, but their efficiency is hampered by insufficient funding and limited capacity.

11. Recommendations

To enhance cybersecurity governance in Nigeria the following are suggested:

1. **Improve enforcement mechanisms.** Strengthen the abilities of regulatory agencies such as NITDA and NCC to oversee and enforce adherence to laws, ensuring the uniform application of cybersecurity legislation across various sectors.
2. **Encourage public-private partnerships.** Increase collaboration among government bodies, private enterprises, and international partners to utilize expertise, technology, and resources more effectively.
3. **Increase investment in capacity building.** Boost funding for training initiatives, awareness campaigns, and the cultivation of local cybersecurity expertise to bridge the skill gap and encourage innovation.
4. **Adopt global best practices.** Nigeria should incorporate international strategies, such as Estonia's digital-first methodology or the UK's focus on safeguarding critical infrastructure, while customizing them to fit local circumstances.
5. **Enhance regional cooperation.** Strengthen partnerships with other African countries to exchange knowledge, synchronize cybersecurity regulations, and collaboratively tackle cross-border cyber threats.

Conflict of interest

The authors declared no conflicts of interest.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc.

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Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

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