Impact and Challenges of E-Government Implementation in Nigeria: A Systematic Literature Review

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Abstract— E-government, the use of information and communication technologies (ICT) to deliver government services electronically, offers numerous benefits, such as streamlined processes, reduced paperwork, and enhanced transparency. Nigeria's e-government journey, initiated in the early 2000s, aims to modernize public administration. However, infrastructure deficits, corruption, and limited digital literacy impede its full potential. This systematic review explores the impacts of e-government services on citizens, businesses, and government agencies in Nigeria and reveals the challenges associated with e-government implementation based on existing literature. Following the PRISMA guidelines, a comprehensive literature search was conducted in SCOPUS and Dimensions databases, focusing on peer-reviewed articles (2000-2024). The Mixed Methods Appraisal Tool (MMAT) was used to assess the methodological quality, resulting in 26 included studies. Findings reveal significant enhancements in government service delivery, transparency, and public participation. 85% of reviewed studies reported efficiency improvements, with systems like IPPIS reducing financial leakages and streamlining HR management. Increased citizen engagement through digital platforms was highlighted by 70% of studies, fostering trust. Critically, over 90% of studies identified poor ICT infrastructure and unreliable power supply as major barriers, while 75% emphasized the negative impact of corruption and low digital literacy. Qualitative synthesis revealed that lack of political will and inconsistent policy implementation were critical obstacles, with only 20% of studies reporting sustained government commitment. While e-government holds transformative potential for Nigeria, addressing these challenges demands targeted interventions, including infrastructure development, digital literacy programs, and stronger policy frameworks. Political will and multi-stakeholder collaboration are crucial for realizing e-government's full potential.

Keywords— E-Government, Nigeria, Literature Review, Public Participation, Government Service Delivery.

I. INTRODUCTION

E-government, or electronic government as the name implies, refers to the use of information and communication technologies (ICT) to deliver government services to citizens, businesses, and other government entities electronically [1]. This encompasses various activities, such as online access to government information and services (e.g., applying for visa permits, renewing driver's licenses, etc.), public participation platforms for policy discussions and feedback, and electronic communication and collaboration between government agencies [2].

The E-government system offers a variety of potential benefits to the contemporary management of government activities. It can streamline processes, reduce paperwork, and automate tasks, leading to cost savings for both government and citizens [3]. Citizens can access government services anytime, anywhere, with an internet connection, enhancing convenience and inclusivity [4]. E-government can also promote transparency by making government data and information readily available, fostering public trust and accountability to the public [5]. Additionally, e-government platforms can facilitate citizen engagement through online forums, surveys, and e-consultation processes, leading to more informed and participatory governance.

Nigeria's journey with e-government initiatives began in the early 2000s, driven by the goal of enhancing public administration services' efficiency and transparency [6]. The initial project objectives aimed to improve government management and efficiency by streamlining processes, reducing administrative burdens, and optimizing resource allocation. These efforts sought to make government services more accessible, convenient, and user-friendly for citizens and businesses, promoting transparency and accountability through increased public access to government information and data and fostering trust and accountability. Additionally, the initiatives aimed to bridge the digital divide by driving digital literacy and technology awareness among both government officials and citizens to ensure inclusive participation. Efforts to foster inter-agency collaboration were also vital, breaking down silos between

government agencies and departments for smoother information sharing and coordinated service delivery. Another critical objective was reducing governance costs by leveraging technology to streamline operations and reduce administrative overhead [7]. Strengthening public-private partnerships was also a focus, exploring collaborations with the private sector to enhance service delivery models and leverage expertise. Adopting a citizen-centric approach, the initiative recognized citizens as customers. They developed robust customer relationship programs to improve satisfaction and trust, providing multi-channel access to government services through online, mobile, and in-person channels [6]. These objectives continue to guide the development of e-government systems in Nigeria.

However, implementing e-government services in Nigeria has faced several challenges, ranging from inadequate ICT infrastructure, lack of top management support, and insufficient public-private partnerships as key barriers [8]. These challenges are not unique to Nigeria; similar issues have been documented in other developing countries. For instance, studies in India and Kenya have highlighted how unreliable power supply and limited internet connectivity hinder e-government adoption, mirroring Nigeria's infrastructural deficiencies [9]. Additionally, infrastructural deficiencies, ICT illiteracy, data privacy concerns, and security issues hinder the successful adoption of e-government, as noted by Bello et al. [10]. These barriers are consistent with findings from other African nations, where low digital literacy and data privacy concerns have been identified as significant obstacles to e-government success [9].

The legal framework for e-governance implementation in Nigeria has also been inadequate, with a lack of legislation on electronic signatures and digital evidence authentication [11]. This is a common issue in many developing countries, where the absence of robust legal frameworks for digital transactions and data protection has slowed the adoption of e-government systems [9]. Furthermore, the low extent of ICT utilization in the public service sector significantly slows down e-governance implementation [12]. This challenge is echoed in studies from countries like Ghana and Bangladesh, where limited ICT adoption in government agencies has been a significant barrier to e-government success [9].

Despite the government's commitments to implement e-government practices, Nigeria was ranked 143rd out of 193 UN member states in the 2018 e-Government global ranking [10]. This low ranking reflects the broader challenges many developing nations face, where e-government initiatives often struggle to achieve their full potential due to a combination of infrastructural, institutional, and socio-economic barriers [9]. However, Nigeria's current efforts to address these challenges are noteworthy. The government

has been actively working towards a more robust and inclusive e-government ecosystem that will transform public service delivery and citizen engagement.

Among the ongoing efforts is the inauguration of the official Nigerian government e-government master plan, developed by the Federal Ministry of Communications, Innovation and Digital Economy [6]. This document outlines the government's strategy for developing and implementing e-government initiatives. It categorizes available e-government services into nine key sectors, providing a comprehensive overview (Table 1). These efforts align with global trends, where many countries are adopting comprehensive e-government strategies to overcome implementation challenges and improve service delivery. By addressing these barriers, Nigeria has the potential to not only enhance its e-government ranking but also contribute valuable lessons to other developing nations facing similar challenges.

TABLE I
CATEGORIES OF E-GOVERNMENT IN SERVICES IN NIGERIAN BY SECTORS [6]

No.	Service Name	Description
1	e-Finance (GIFMIS/SIFMIS)	Financial Management Information System
2	e-Procurement	Electronic Procurement System
3	e-Taxation	Electronic Tax Payment System
4	e-Customs	Electronic Customs Services
5	e-Education	Online Education Services
6	e-Health	Online Healthcare Services
7	e-Agriculture	Online Agricultural Services
8	e-Immigration	Electronic Immigration Services
9	e-Voting	Electronic Voting System
10	Seamless Government System	Internal Government Communication Platform
11	Public Information Sharing System	Platform for Sharing Public Information

Several researchers have systematically reviewed e-government implementation from a global perspective. For instance, Aleisa [13] conducted a comprehensive systematic literature review of key factors influencing e-government adoption, categorizing determinants by their relative impact. By integrating findings from diverse studies, Aleisa emphasized the importance of non-technical factors and introduced an interdisciplinary approach that bridges information technology with fields such as sociology, anthropology, and behavioural sciences. The study found that user behaviour, optimism bias, and subjective norms significantly shape attitudes toward e-government, with trust in e-government (TEG) emerging as a critical determinant. Non-technical factors like cultural, religious, and social influences also played substantial roles in e-government adoption, alongside key determinants like performance expectancy and security perceptions.

Similarly, Wu et al. [14] conducted another systematic literature review identifying the most frequently used factors impacting e-government acceptance, specifically focusing on theories and their effects on e-government adoption.

Within the context of developing countries, particularly African nations, several studies address the design and technical aspects of e-government systems. Mahendra et al. [15] conducted a systematic literature review to analyse current Enterprise Architecture (EA) practices across government agencies using 32 primary studies, revealing that EA is often used in e-government application design and addressing technical challenges in government agency operations. However, this study focused primarily on technical aspects, overlooking broader implementation challenges. Additionally, Madaki [16] uses a systematic literature review to examine factors impacting IT integration in e-government within developing nations, identifying challenges such as resource constraints, resistance to change, and interoperability issues. While the study highlighted IT integration's potential benefits, like improved efficiency and service delivery, it illustrated the complex interconnections between these challenges and their practical benefits. Saleh [17] also uses a systematic literature review to explore determinants of e-government adoption from a citizen-centric perspective, proposing the Integrated Model of E-government Adoption (IMEGA) to predict adoption behaviours. Key factors influencing citizen intention included perceived trust, quality, performance expectancy, and demographic variables such as age and education, highlighting the nuanced drivers behind adoption decisions.

In Nigeria, e-government systems have the potential to enhance public service delivery and improve citizen engagement significantly [6]. However, persistent issues such as non-functional ministerial websites and inconsistent adoption across ministries reveal a significant gap between system availability and actual usage [18]. While previous empirical studies have investigated various aspects of e-government implementation in Nigeria, these studies often focus on isolated challenges or specific sectors, resulting in a fragmented understanding of the broader barriers and enabling factors. For instance, some studies highlight infrastructural deficiencies [8], while others emphasize low digital literacy [10] or weak policy frameworks [11]. This lack of a cohesive, systematic analysis has left critical gaps in understanding the interplay between these factors and their collective impact on e-government adoption and effectiveness.

This research addresses this gap by conducting a comprehensive systematic literature review (SLR) that consolidates insights from existing studies to provide a unified perspective on the most reported challenges and enabling factors. By synthesizing fragmented findings, this study aims to bridge the knowledge gap in the current literature, which lacks a holistic analysis of the critical factors influencing e-government success and hindering adoption in Nigeria. Bridging this gap is crucial for developing evidence-based strategies that address the root causes of low e-government adoption and improve implementation outcomes. Thus, the main objective of this SLR is to consolidate insights into these factors and provide a foundation for informed policy development.

This study first seeks to assess the impact of e-government services implementation on citizens, businesses, and government agencies in Nigeria and, secondly, to identify the challenges associated with e-government adoption as documented in the existing literature. By achieving these objectives, the study aims to guide future strategies that enhance e-government effectiveness and facilitate wider adoption across Nigeria. Furthermore, this research contributes to the global e-government discourse by offering a nuanced understanding of the Nigerian context, which can serve as a reference point for other developing countries facing similar challenges.

II. LITERATURE REVIEW

A. *Global Variations in E-Government Adoption*

Citizen engagement with e-government systems varies significantly across countries, influenced by factors such as e-readiness, adoption challenges, and the specific services offered. Countries develop and implement e-government solutions tailored to their unique social and political contexts, which results in varying degrees of adoption and citizen engagement [19]. In developing nations, barriers such as inadequate IT infrastructure, limited ICT access, and low digital literacy often hinder e-government adoption [5]. Despite these challenges, certain countries have successfully implemented e-governmental initiatives. Examples include Estonia's online voting system and Kazakhstan's citizen proposal system, both of which have enhanced citizen engagement [20]. Leading countries like the Republic of Korea, Australia, Spain, and New Zealand consistently rank high in the UN's e-participation index, reflecting their strong e-government frameworks [21].

B. *Public Value Dimensions in E-Government*

Twizeyimana and Andersson [5] categorize the public value of e-government into six key dimensions: improved government services, enhanced administrative efficiency, open government capabilities, ethical behaviour, trust in government, and social well-being. These dimensions underline the broad benefits of e-government, impacting citizens and public institutions alike. However, realizing the

full potential of e-government requires addressing various technical, organizational, and cultural barriers. The specific types of e-government services available and the level of e-readiness within a country significantly impact citizen engagement. Successful e-government initiatives depend on overcoming these obstacles and leveraging available services to foster greater public involvement.

C. E-Government Implementation in Nigeria

Several researchers have investigated the implementation of e-government in Nigeria, exploring diverse perspectives. Afieroho et al. [7] focused on the public's adoption of e-government tools to monitor public infrastructure projects, emphasizing the importance of factors such as performance expectancy and social influence to increase adoption rates. The effective deployment of e-government is also linked to open government data (OGD), which fosters transparency and citizen engagement by making data accessible through digital platforms. Ezema [18] examined the availability of OGD on Nigerian government websites and found that while some agencies made data available, over 60% lacked such transparency. Additionally, infrequent updates on the Nigerian Data Portal highlighted gaps in data accessibility, indicating that further exploration of these challenges is essential to inform policy improvements and drive investments in infrastructure and digital literacy.

D. E-Government's Role in Public Service Modernization

E-government presents a promising approach to modernizing Nigeria's public service, particularly in areas like human resource management (HRM). However, challenges such as weak infrastructure, limited digital skills, and resistance to change have hindered successful implementation [22]. Although the Nigerian government's e-government master plan addresses some of these issues, understanding the most frequently reported challenges with current e-government systems is crucial. Without active citizen engagement, the transformative potential of e-government systems in public service reform may remain unfulfilled. This study addresses this gap by collecting evidence of e-government impacts and challenges in Nigeria through a systematic review.

E. Factors Influencing Citizen Adoption of E-Government in Nigeria

Research on the factors influencing citizen adoption of e-government services in Nigeria has yielded critical insights. Muhammad and Kaya [23] applied the Unified Model of E-Government Adoption (UMEGA) to examine factors impacting adoption, identifying that performance expectations and ease of use positively influenced citizen attitudes while perceived risks deterred adoption. However, their study did not delve into the specific challenges faced in

implementing e-government. Abdulkareem and Mohd Ramli [3] emphasized trust as a core component of successful e-government. They found that trust, shaped by information and service quality, directly influences user satisfaction and the public value of e-government. Building trust in e-government is essential to encourage engagement and satisfaction, which are vital for the perceived effectiveness of digital governance.

Ogunsola and Tiamiyu [24] contribute to the discourse on e-government by examining factors that influence its use among Nigerian citizens and businesses. Their study reveals that customer readiness, perceived service quality, and web readiness significantly impact e-government service usage. However, they also found that overly complex ICT deployments can hinder citizen engagement, underscoring the importance of user-friendly, intuitive designs. To maximize public use, e-government services should be tailored to citizens' comfort levels with technology, ensuring accessibility and ease of use.

Lawan et al. [10] identify critical obstacles to e-government success in Nigeria, including national challenges such as infrastructure deficiencies, lack of ICT literacy, and data privacy concerns. These challenges and issues unique to the Nigerian context create significant barriers to successful e-government adoption. Addressing these challenges is essential to ensure that Nigeria can fully realize the benefits of digital governance and public service efficiency.

This Systematic Literature Review (SLR) is significant as it addresses a critical gap in the existing e-government literature by comprehensively analyzing the challenges and impacts of e-government implementation in Nigeria. While numerous studies have explored e-government adoption globally, a lack of cohesive, evidence-based research systematically examines the unique barriers and enablers of e-government in Nigeria, particularly in the context of its socio-economic and infrastructural challenges. By synthesizing existing studies, this review identifies the key barriers to e-government adoption in Nigeria, such as inadequate infrastructure, low digital literacy, and weak legal frameworks, and also highlights how these challenges align with or diverge from those other developing nations face. Furthermore, this study fills a gap in the literature by offering a unified perspective on the most reported challenges and enabling factors, often fragmented across individual studies. The findings from this SLR provide valuable insights for policymakers, practitioners, and researchers by offering evidence-based recommendations to address these barriers and improve e-government effectiveness. By bridging this knowledge gap, this study contributes to the global e-government literature and

serves as a reference point for other developing countries with similar challenges.

III. Methods

This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure a systematic, rigorous, and transparent research process. Recognizing the importance of an unbiased and comprehensive examination of e-government implementation in Nigeria, a systematic literature review (SLR) was selected as the most appropriate methodological approach. Adhering to PRISMA, the research process involved (1) formulating clear research questions, (2) developing precise search terms, (3) establishing a robust search strategy, (4) defining detailed inclusion and exclusion criteria, (5) conducting a comprehensive search across the selected databases, (6) meticulously selecting relevant articles based on eligibility criteria, and (7) performing a thorough quality assessment of the included studies.

This structured approach, underpinned by PRISMA guidelines, ensures a reliable synthesis of insights that support the development of effective strategies to enhance e-government adoption and implementation in Nigeria.

A. Search Strategy and Inclusion Criteria

A comprehensive search was conducted in the SCOPUS and Dimensions databases in July 2024 to identify relevant studies on e-government implementation in Nigeria. A structured search strategy was applied using specific keywords, filters, and inclusion criteria to ensure a broad and inclusive selection of studies.

Search Query: The search employed a combination of controlled vocabulary and free-text terms related to e-government:

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TITLE-ABS-KEY ("e-government*" OR "electronic
government" OR "e-governance" OR "government
data processing" OR "e-services" OR "e-
participation" OR "digital government" OR "e-
democracy" OR "government websites" OR "open
government" OR "open government data" OR "m-
government" AND Nigeria*) AND PUBYEAR > 2000 AND
PUBYEAR < 2025 AND (LIMIT-TO (LANGUAGE,
"English"))
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Search Filters and Refinement: The search was refined using the following criteria to enhance relevance and focus:

TABLE II
SEARCH FILTERS AND REFINEMENT

Criteria	Details
Databases	SCOPUS, Dimensions
Timeframe	Studies published between 2000 and 2024 (aligning with Nigeria's e-government timeline)
Language	English only (to ensure consistency in analysis)
Publication Type	Peer-reviewed journal articles and conference proceedings
Keywords Used	"e-government*", "electronic government", "e-governance", "government data processing", "e-services", "digital government", "m-government", "e-participation", "e-democracy", "government websites", "open government", "open government data"
Exclusion Criteria	Studies not related to Nigeria, non-peer-reviewed sources, duplicate publications

The search was refined by limiting results to articles published between 2000 and 2024, written in English, and peer reviewed. This timeframe was selected to align with the Nigerian e-government journey, as documented by FMCIDE [6]. This structured approach ensured comprehensive coverage of e-government adoption, challenges, and impacts in Nigeria while filtering out irrelevant studies for a focused, high-quality literature review.

B. Search Outcome and Exclusion Criteria

The initial database search in Scopus and Dimensions yielded a substantial output of 179 records. A meticulous screening process based on titles, abstracts, and keywords was conducted to refine this pool, resulting in 122 articles advancing to the full-text evaluation stage. A supplementary search was conducted to capture potentially missed studies during the initial database search, including three additional articles. However, only one of these met the inclusion criteria, as shown in Figure 1.
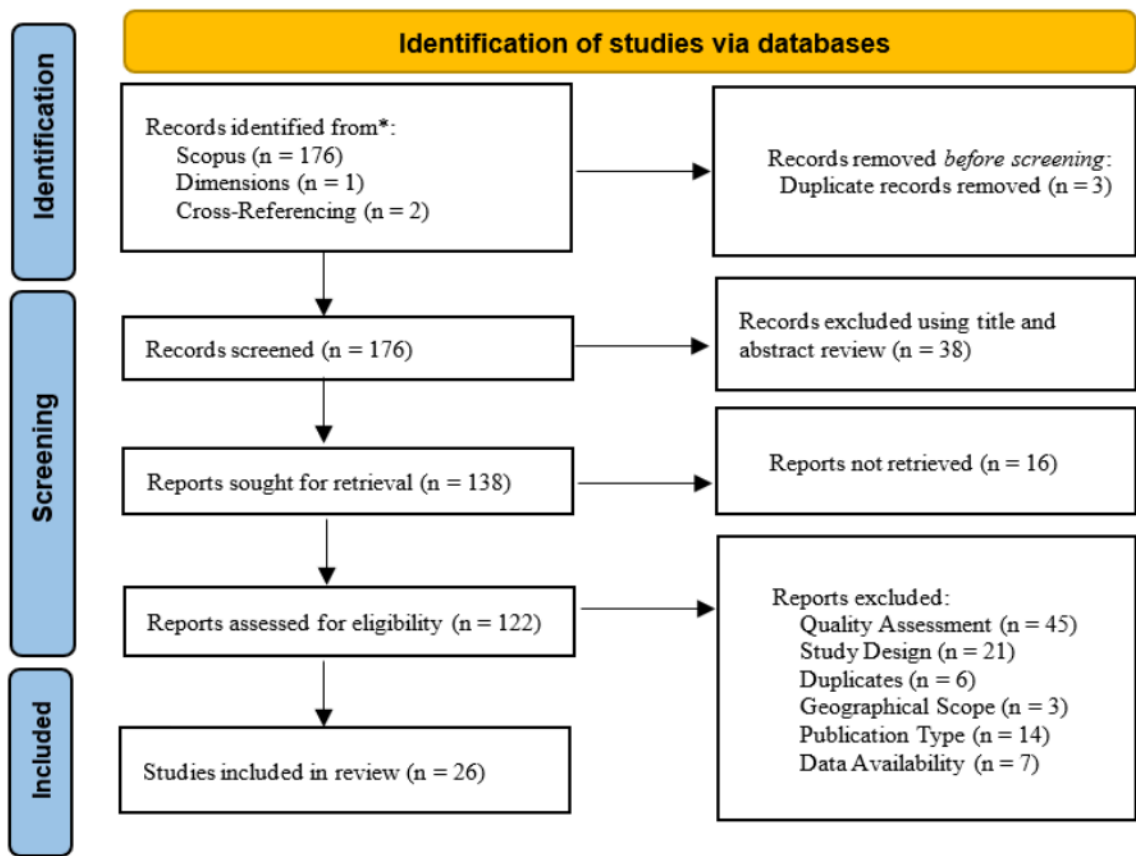
Fig. 1. PRISMA Flow Chart

The Mixed Methods Appraisal Tool (MMAT) was used to assess the methodological quality of the 122 full-text articles, excluding 45 studies due to low methodological quality, as evidenced by significant flaws in research design, data collection, or analysis. Additionally, several other criteria were applied to refine the study selection. Studies were excluded due to irrelevant study design (n=21), primarily consisting of opinion pieces and case studies that did not contribute to the research objectives. The geographical scope was also a factor, with studies conducted outside Nigeria (n=3) being removed. To maintain research integrity, duplicate publications (n=6), inappropriate publication types such as non-peer-reviewed articles (n=14), and studies with insufficient data (n=7) were excluded. A comprehensive list of the included and excluded studies is available as supplementary data to this study. This selection process yielded a final sample of 26 studies for in-depth analysis.

A. Quality Assessment

A comprehensive quality assessment was conducted to ensure the rigor and trustworthiness of the included studies. The MMAT developed by Hong et al. [25] was employed to evaluate the methodological quality of the studies. This tool assesses various aspects of study design, including research questions, data collection, and analysis. In order to avoid any form of selection biases, two independent reviewers applied the MMAT to each study, with discrepancies resolved through consensus or by a third reviewer. Studies were assigned scores based on predefined criteria, with higher scores indicating better methodological quality. Studies deemed to have critically low quality were excluded from further analysis.

B. Data Analysis

A total of 26 studies were included in this review. The quality assessment results, conducted using the MMAT [25], are presented in Table 2 for reference, with ratings based on the criteria of the selected category or categories. The criteria were evaluated using three response options: 'Yes' (criterion met), 'No' (criterion not met), and 'Can't tell' (insufficient information to judge). In addition to the quality

assessment, a thematic analysis approach was employed to extract and analyse the necessary data. This method involved an iterative process of coding, categorizing, and identifying patterns across the studies. The analysis progressed systematically from initial data familiarization through the development of preliminary themes to the identification of core themes, providing a structured understanding of the findings.

TABLE III
SUMMARY OF THE INCLUDED STUDIES IN THE REVIEW

S/N	Studies	Summary of the included studies' objectives and outcomes
1	[7]	The study investigates the factors influencing the Nigerian public's adoption of e-government tools for public participation in monitoring public infrastructure projects (PIPs), providing scholars with an exploratory baseline for e-government adoption in PIP management and offering recommendations for policymakers, government technocrats, and project engineers.
2	[26]	This study examines the role of open data in boosting fiscal transparency and accountability in African municipalities, focusing on South Africa and Nigeria. It suggests that open data can enhance citizen scrutiny of municipal budgets, thereby promoting credible, participatory local governance.
3	[18]	This study examines the availability and status of open government data on Nigerian ministry and agency websites, including the Nigeria Data Portal. It anticipates low data availability, with the Portal containing outdated information, and aims to identify challenges and propose mitigation strategies.
4	[27]	This study investigates users' perceptions of the e-government services delivered through the Nigeria Immigration Service (NIS) website, aiming to identify areas for improvement and provide recommendations for enhancing service quality and guiding future research.
5	[28]	This research examines the integration of Personnel and Payroll Information Systems with Public Financial Management in Nigeria's Public Service, aiming to provide insights into the system's effectiveness and implications for public service operations.
6	[23]	This study examines factors influencing e-government adoption in Nigeria, providing insights for policymakers to improve practices and expand understanding of adoption determinants.
7	[29]	This study investigates the types of public value citizens seek from e-government, key predictors of public value creation, and the relationship between e-government initiatives and value for citizens, providing insights to enhance e-government's effectiveness.
8	[30]	This study develops an e-voting system using agile and component-based engineering to improve Nigeria's manual voting issues, aiming to boost voter participation, reduce costs, and expedite results for a more credible election process.
9	[31]	This study examines informed Nigerians' perceptions of government transparency in COVID-19 communications, assessing its impact on public trust and disease control, with recommendations for enhanced transparency.
10	[32]	This research develops a blockchain-based framework to enhance transparency, ease, and effectiveness in Nigeria's public procurement, promoting interoperability, citizen participation, and improved project monitoring and auditing.
11	[33]	The study explores the technological, organizational, and environmental factors that impact the adoption of integrated e-government initiatives in Lagos, Nigeria's housing and urban development sector, aiming to understand their influence on successful implementation and public acceptance.
12	[34]	This study investigates why e-governance initiatives have not improved service delivery in Cross River State, Nigeria, focusing on how enhancing civil servants' digital literacy and in-service training can drive better outcomes.
13	[35]	The study examines factors that influence citizens' acceptance and use of e-democracy in Nigeria, focusing on predictors like political culture, awareness, efficacy, and recruitment networks, and suggests strategies such as political orientation programs to boost participation.
14	[36]	This study investigates factors hindering e-government diffusion in Nigeria by examining three innovation diffusion models, identifying key factors like trust and electricity supply alongside established model factors to help policymakers enhance e-government adoption strategies.
15	[37]	This study assesses the availability and status of open government data (OGD) on Nigerian government websites, identifies challenges to its implementation, and offers recommendations to enhance OGD adoption in Nigeria.
16	[38]	This study explores the interrelationships between ICT deployment, web-readiness, and the quality of web presence on Nigerian e-government websites, emphasizing how ICT investment impacts functionality and user experience and advocating for improved alignment between technology and design.

S/N	Studies	Summary of the included studies' objectives and outcomes
17	[3]	This study examines how trust in e-government affects Nigeria's usage, success, and public value. It highlights trust as a mediator between service quality and public value and a critical factor for successful e-government implementation.
18	[39]	This study assesses the security of Personally Identifiable Information (PII) in e-government services on Nigerian embassy websites in developing nations, identifying vulnerabilities and recommending an OWASP ASVS-based framework to enhance data protection.
19	[40]	This study examines factors affecting public servants' readiness to adopt e-government services in Nigeria, focusing on performance expectancy, self-efficacy, social influence, attitudes, and demographic influences such as age and gender.
20	[41]	This study explores the potential of mobile voting (M-Voting) to enhance e-participation in democratic processes, anticipating improving accessibility, convenience, and security, thereby engaging a broader population in voting.
21	[42]	This study explores the adoption of e-voting in Nigeria, examining key definitions, challenges, and the state of e-government adoption in both developed and developing countries, with the expectation that addressing these factors is crucial for successful e-voting implementation in Nigeria.
22	[43]	This study explores the role of e-governance in enhancing local government capacity in Nigeria, identifying challenges and opportunities. It finds that ICT deployment has had a limited impact due to a lack of political will and integration issues. Addressing these factors is key to improving local governance.
23	[44]	This study examines the role of institutions in facilitating ICT adoption, focusing on the failed implementation of Nigeria's electronic voter registration (EVR) system. It aims to identify institutional factors hindering its adoption and provide insights for policymakers to improve future ICT initiatives.
24	[45]	This study examines the opportunities and challenges of e-government in Nigeria, highlighting benefits like faster service and transparency. It also addresses challenges like weak infrastructure, outages, and limited expertise. The findings aim to guide improved e-government strategies.
25	[46]	This study examines the challenges hindering e-government adoption in Africa, using Nigeria as a case study, and proposes European cooperation as a solution. It aims to identify key roadblocks and suggest collaboration between African and European countries to improve e-government practices.
26	[47]	This study investigates data acquisition methods for effective e-government implementation in Nigeria, focusing on citizen-government communication platforms and awareness. It aims to develop a more efficient information exchange model to improve citizen engagement and government service delivery.

IV. RESULTS

A. Impact of E-Government Implementation in Nigeria

To assess the impact of e-government services from the selected studies, the studies were analysed to identify reported outcomes across various sectors. Thematic analysis was employed to categorize these impacts into different dimensions, as presented in Table 3, which are further discussed separately in the subsequent sections.

TABLE IV
IMPACT OF E-GOVERNMENT IMPLEMENTATION IN NIGERIA

No.	Themes	Studies
1	Enhancing Government Service Delivery)	[43], [29], [36], [45], [32], [26], [30], [41], [40], [28], [33], [31], [35], [3].
2	Public Participation in Government	[7], [37], [26].
3	Security of Government Records and Data	[39].

1. Enhancing Government Service Delivery

Implementing e-government systems has significantly enhanced government service delivery across various dimensions in Nigeria. A critical aspect of this enhancement is the increased transparency and accountability that e-government provides. According to Adeyeye and Aladesanmi [43], local governments that maintained websites were generally more transparent and financially accountable. The study further revealed that having internet access in local governments facilitated quicker dissemination of information, thereby improving communication efficiency.

Agbabiaka [29] emphasized the value creation in e-government systems, noting that these systems need to support citizen engagement and participation. This engagement is crucial for improving perceptions of accountability and transparency, which are fundamental in building trust between the government and its citizens. Agbabiaka [29] also pointed out the importance of personalizing e-government systems to cater to individual needs, promote autonomy, and ensure citizens feel heard and valued. The benefits of e-government extend beyond

transparency and efficiency. Amagoh [36] identified five key benefits: easy access to government information, improved efficiency, increased transparency and accountability, enhanced economic activity, and better democracy. Similarly, Asogwa [45] outlined the aspirations of Nigerians from the e-government project, which include sustainable access to government information, reduced corruption, virtual government-citizen interactions, and the promotion of public sector reforms.

Furthermore, emerging technologies like blockchain have been identified as potential solutions to improve government service delivery. Akaba et al. [32] highlighted that any successful new blockchain system must be user-friendly and support public servants' daily routines. This is particularly important as current processes are often stressful and time-consuming. A novel blockchain system is expected to alleviate these challenges, gaining full acceptance among users. The importance of open data in promoting good governance and accountability is underscored by Kariuki et al. [26]. They argued that open data is essential for credible participatory governance at all levels and requires political will to make critical data accessible to the public.

E-voting systems have also been identified to improve electoral participation and reduce the costs associated with organizing elections. Falade et al. [30] noted that using an e-voting system would increase voter participation and significantly reduce the cost of conducting elections compared to manual processes. In the context of electoral processes, Ekong and Ekong [41] found that mobile voting (M-voting) offers several advantages over traditional voting methods, including convenience, accessibility, and reduced stress. However, issues such as voter apathy and lack of trust remain that must be addressed.

In the realm of public sector reforms, the Integrated Personnel and Payroll Information System (IPPIS) has proven to be a successful administrative reform tool. According to Inakefe et al. [28], IPPIS has minimized delays in salary payments, reduced financial leakages, and simplified the human resource management processes in government ministries. This reform has freed up financial resources, allowing the government to pursue developmental activities more effectively. Olatubosun and Rao [40] discussed the broader implications of electronic governance, noting that it improves internal efficiency, public service delivery, and democratic governance. This accessibility of public services is a key factor in the success of e-government initiatives. The public's perception of the benefits of e-government is also critical. Olumoye and Govender [33] found that the perceived benefits of e-government, particularly in essential areas like housing

development, play a significant role in its acceptance and success.

The role of traditional communication channels in disseminating government information, particularly in low-literacy areas, was highlighted by Ernest-Samuel and Uduma [31]. They emphasized the importance of mobilizing community leaders to use oral means and traditional media to spread information effectively, particularly during crises such as the COVID-19 pandemic. Finally, Oni et al. [35] stressed the importance of building trust in the democratic process through e-democracy initiatives. They argued that transparency, accountability, and responsiveness are crucial in fostering citizens' trust and encouraging participation in e-democracy. Abdulkareem and Mohd Ramli [3] also confirmed the importance of providing accurate, reliable, and up-to-date information through e-government platforms. They emphasized the need for seamless online services to ensure citizens can easily access and pay for government services.

In summary, enhancing government service delivery through e-government involves multiple facets, including transparency, efficiency, citizen engagement, and adopting new technologies. These improvements make government operations more effective and foster greater trust and participation among citizens.

2. *Public Participation in Government*

Public participation is critical in ensuring transparency, accountability, and overall effectiveness in government operations. The adoption of e-government tools has shown promise in enhancing this participation, particularly in the context of monitoring public investment projects (PIPs). According to Afieroho et al. [7], the Unified Theory of Acceptance and Use of Technology (UTAUT) framework was utilized to identify factors that facilitate public adoption of e-government tools for monitoring PIPs in Nigeria. The study revealed a strong behavioural intention among the Nigerian public to adopt these tools and techniques, with an average response score of 4.05 on a five-point Likert scale. This willingness to participate in monitoring PIPs execution is particularly noteworthy given the historically low levels of public participation in other areas, such as participatory budgeting, land use, and natural resource management in Nigeria. The findings suggest that e-government adoption could potentially revive public engagement in governmental processes that have traditionally seen limited participation.

Ezema [37] highlighted a growing interest among Nigerian citizens in implementing open government data. This interest is driven by the desire to participate actively in governmental programs and activities. The efforts by a few government agencies to make data freely available on their websites are seen as indicators of a broader democratic

culture in Nigeria, where the push for transparency and accountability is gaining momentum. This shift towards government openness reflects the public's demands and shows the government's responsiveness.

Further emphasizing the importance of public participation, Kariuki et al. [26] argued that public scrutiny of local government data is essential for strengthening fiscal credibility and performance. Increasing transparency through scrutinizing municipal budgets empowers citizens to take a more active role in local governance. This involvement not only promotes better fiscal management but also enhances the overall governance process by ensuring that the voices of the public are heard and considered in decision-making processes.

In conclusion, public participation in government is being increasingly recognized as a vital aspect of effective governance. Adopting e-government tools, implementing open government data, and actively scrutinizing government operations by the public are all critical to fostering a more transparent, accountable, and responsive government in Nigeria.

Fig. 2. Impact of E-Government in Nigeria

3. *Security of Government Records and Data*
Government records and data security are paramount, particularly when formal personal identifiable information (PII) protection regulations are involved. Adedayo et al. [39] explored this issue within the scope of Nigerian embassies that are engaged in online registration of Nigerian citizens residing in The Americas, Europe, and Asia. The study underscores the importance of securing government records, especially in developing countries where the regulatory frameworks for PII protection are not yet fully established.

The study recommends that the insights gained from the research can be applied to the specific embassies studied

and broaden governmental operations in similar contexts. Ensuring government data security is crucial for protecting citizens' personal information, maintaining trust in governmental processes, and safeguarding national security. As governments increasingly rely on digital systems for service delivery and citizen engagement, implementing robust security measures becomes even more critical.

B. *Challenges of E-Government Implementation*
A thematic analysis was also conducted on the included studies to identify the challenges associated with e-government implementation. The challenges were categorized into themes, as indicated in Table 4 and discussed in subsequent sections.

TABLE V
CHALLENGES OF E-GOVERNMENT IMPLEMENTATION

No.	Themes	Studies
1	Challenges in Modern and ICT Infrastructures	[32], [43], [36], [45], [42], [46], [37], [23], [27],
2	Corruption and E-Government Implementation	[32], [42], [31].
3	Lack of Digital Literacy	[34], [44].
4	Political Will and the Lack of Policy Implementation	[32], [18], [24]

1. *Challenges in Modern and ICT Infrastructures*
This study highlights that poor ICT infrastructure, including limited internet connectivity, outdated systems, and unreliable power supply, remains a significant barrier to implementing e-government services in Nigeria. The lack of modern ICT tools and platforms hinders the ability of government agencies to deliver services efficiently and securely. For instance, over 90% of the reviewed studies identified unreliable electricity and inadequate internet access as significant obstacles, particularly in rural areas where infrastructure deficits are most pronounced. These challenges slow down the adoption of e-government systems and limit their effectiveness in improving transparency, efficiency, and citizen engagement. The limited presence of infrastructure in local governments leads to minimal impact from ICT deployment, even though there is a strong positive correlation between ICT deployment and meeting the needs of the citizenry, as highlighted by Adeyeye and Aladesanmi [43]. The country's unreliable power situation is a major obstacle, which Akaba [32] emphasizes as a critical challenge to effectively implementing advanced technologies such as blockchain. This concern is echoed by Amagoh [36] and Asogwa [45], who point out that the lack of reliable electricity,

compounded by other issues like corruption, poor access to ICT facilities, and low internet penetration, significantly hinders the diffusion of e-government services in Nigeria.

Brooks and Mohammed [42] provide a broader context by discussing the readiness for e-government in developing countries, noting that infrastructure and literacy are fundamental challenges. Additionally, they highlight that factors such as trust, attitude, and corruption further complicate the adoption of e-government. The challenges are not limited to power supply; as Eka [46] discusses, outdated infrastructures and over-crowded networks lead to severe connectivity issues, making it challenging to advance meaningful e-government initiatives.

Ezema [37] underscores the ongoing struggles with poor and irregular internet connectivity, which, alongside an inadequate public power supply, severely hampers the implementation of digital open government data (OGD) in Nigeria. Muhammad and Kaya [23] stress the need for substantial investment in technical infrastructure, including reliable internet and electricity, to foster an environment where e-government services can thrive. Moreover, Okunola and Rowley [27] confirm that the potential benefits of e-government services in Nigeria are not fully realized due to the persistent lack of reliable electricity and internet connectivity. They also identify additional challenges related to website design, security, and privacy, further complicating the effective use of e-government services.

These observations collectively paint a picture of the significant infrastructural deficits in Nigeria, particularly in ICT and electricity supply, which must be addressed to unlock the full potential of e-government in the country.

2. Corruption and E-Government Implementation

According to this study, corruption in e-government implementation refers to deliberately misusing public office, policies, and digital governance tools for personal or political gain, ultimately hindering transparency and efficiency. The study highlights how government officials resist digital transformation to maintain control over manual processes that facilitate illicit activities. For instance, political interference and reluctance to adopt blockchain-based procurement and financial management systems obstruct efforts to enhance accountability. Akaba et al. [32] highlight that stakeholders often resist adopting such technologies due to their potential to restrict traditional methods that facilitate fraud and manipulation of figures. This reluctance is symptomatic of a broader issue where corruption hinders technological progress. Similarly, Brooks and Mohammed [42] emphasize that, alongside infrastructure and literacy, corruption is a critical factor affecting the readiness and success of e-government initiatives in developing countries. The pervasiveness of

corruption stifles technological advancements and erodes public trust. Ernest-Samuel and Uduma [31] provide a poignant example during the distribution of palliatives, where unclear criteria and distribution methods led to public distrust and criticism of the government. These instances underscore the need for transparency, accountability, and a commitment to combating corruption to foster trust and enable the successful implementation of modern technologies in governance.

3. Lack of Digital Literacy

According to this study, lack of digital literacy in the context of e-government implementation refers to the insufficient ability of citizens and government officials to effectively use digital tools and platforms for accessing and delivering public services. Some studies highlighted that limited digital skills among civil servants hinder the efficient adoption of e-government systems, resulting in underutilization and poor service delivery. Additionally, inadequate public awareness and training programs prevent many citizens from engaging with e-government platforms, further widening the digital divide. For instance, Inakefe et al. [34] highlight how the Cross River State civil service's efforts to adopt e-governance as part of its digitalization strategy are being hindered by inadequate digital literacy. This problem is exacerbated by a lack of in-service training, resulting from administrative resistance to ICT reforms. McGrath and Maiye [44] further emphasize the challenges posed by inadequate digital literacy, particularly in the context of reliable personal identification. They note that the lack of widespread, reliable identification methods complicates training efforts related to knowledge deployment. This issue is linked to broader national challenges, such as the incomplete National Identity Cards Scheme rollout. Furthermore, the inefficiencies in training processes, especially for staff temporarily deployed from headquarters, are exacerbated by unfamiliarity with local contexts, further underscoring the need for improved digital literacy and training.

4. Political Will and the Lack of Policy Implementation

According to this study, political will in the context of e-government refers to the commitment of top government leaders to drive the successful adoption and implementation of digital governance initiatives. In contrast, the lack of policy implementation reflects the failure to translate strategic plans into actionable outcomes. The study highlights inconsistent political commitment and weak enforcement of e-government policies, which have significantly slowed progress in Nigeria. Akaba et al. [32] discuss the importance of political will in ensuring the successful implementation of blockchain technology for e-procurement systems in the public sectors in Nigeria to

facilitate e-government services. They highlight that compliance with requirements remains insufficient without the commitment of both the executive and legislative branches of government. Similarly, Ezema [18] notes the ongoing challenges in Nigeria's open government data (OGD) realm. While some government agencies have made efforts to make data accessible online, the majority have not followed suit, largely due to the absence of a clear policy framework. This lack of published guidelines signals insufficient political will to advance transparency and accountability through OGD. Ogunsola and Tiamiyu [24] further emphasize the need for specific policy implementations, particularly in enhancing government websites to cater to the needs of people with disabilities. They point out that the absence of such policies continues to exclude this demographic from fully benefiting from e-government services.

Fig. 3. Challenges of E-Government Implementation

V. DISCUSSION

The findings from this study highlight both the advancements and the challenges associated with e-government implementation in Nigeria, offering critical insights for policymakers, technology developers, and administrators. E-government adoption in Nigeria has produced measurable benefits, particularly in enhancing public service delivery, improving transparency, and promoting citizen participation. Systems such as the Integrated Personnel and Payroll Information System (IPPIS) have demonstrated clear advantages, including reduced financial leaks and more efficient human resource management [28]. This mirrors global trends in successful e-government programs that have strengthened public sector accountability and operational efficiency. The Nigerian government's emphasis on inter-agency collaboration and initiatives to engage the private sector in service delivery aligns with international e-governance models that leverage multi-stakeholder engagement to improve public service outcomes. However, for Nigeria to fully realize these benefits, there is a need to address the underlying challenges that have hindered widespread e-government adoption and impact [48].

One of the primary obstacles identified is Nigeria's underdeveloped infrastructure, including limited internet connectivity, outdated ICT resources, and unreliable electricity supply [36]. These deficiencies disrupt access to e-government services, especially in rural areas, and are consistent with challenges in other developing nations where infrastructural limitations constrain digital innovation. Solutions such as mobile-enabled e-services, which have been employed in other countries with infrastructure gaps, could be further explored to increase accessibility [49]. However, without substantial improvements in infrastructure, particularly in stable power and connectivity, Nigeria's e-government progress will remain constrained [45].

Similarly, looking at these challenges from other developing countries' perspectives, a study conducted by Abusamhadana et al. [50] indicated that, even though E-government implementation in Ghana has benefitted the country in reducing corruption and efficient service delivery, challenges like the digital divide, cultural issues, and infrastructure problems persist. Ramli [51] also conducted a comparative analysis to explore Malaysia and South Korea's different challenges in implementing e-government initiatives. It highlights technological readiness, public trust, and administrative capabilities as significant influences on implementation success.

Digital literacy also emerged as a significant barrier, limiting both citizens' and public servants' ability to engage effectively with e-government platforms. Despite some training efforts, insufficient digital skills across the workforce and the public create usability issues and reduce adoption rates [52]. Addressing this challenge requires investment in widespread digital literacy programs that equip users with the necessary skills to utilize e-government services confidently. Lessons from countries that have invested in digital literacy at scale, such as South Korea and Estonia, could inform Nigeria's strategies to improve adoption and usability [21],[53].

From a global perspective, Samsor [54] identifies key challenges to e-government implementation in Afghanistan, including stakeholder involvement, coordination, information sharing, ICT literacy, and awareness. In Jordan, Al-Shboul et al. [55] investigate various challenges with e-

government services, including budgeting, human expertise, social influence, and data privacy concerns. It concludes that a significant gap exists between the design and reality of e-government projects, which affects their success. According to Nurhidayat et al., [56] among the main challenges of e-government implementation in Indonesia are lack of data integration, minimal public participation, and lack of technical understanding among civil servants.

Another notable challenge is the prevalence of corruption and the lack of political will, which impacts the transparency and accountability of e-government initiatives [57]. Corruption discourages public trust and impedes the rollout of transparent digital systems, while inconsistent commitment from government entities undermines policy implementation. Strengthening regulatory frameworks, ensuring consistent political support, and promoting transparency through open government data initiatives could enhance trust and support e-government effectiveness [58].

From a global view among the developing countries, Zeebaree & Aqel [59] identified among the main critical challenges to e-government implementation in developing countries are organizational, political, social, and infrastructure-related. Similar findings were also presented by Arief and Yunus Abbas [60], that E-government implementation faces challenges in developing and developed countries, including IT infrastructure, human resources, policy/legislation, politics, economy, geography, and culture.

VI. CONCLUSION

This systematic review provides a comprehensive overview of the impact and challenges of e-government implementation in Nigeria. The analysis reveals that e-government has the potential to significantly enhance government service delivery, improve transparency and accountability, and increase citizen participation, particularly in developing countries globally. By leveraging information and communication technologies, governments can streamline processes, reduce costs, and enhance the quality of public services. However, several challenges hinder fully realizing e-government's potential in Nigeria. Inadequate infrastructure, including unreliable power supply and limited internet connectivity, poses significant obstacles to the successful implementation of e-government initiatives.

Moreover, corruption and a lack of capacity building have further impeded progress. The review also highlights the importance of public participation in the e-government process. Citizens' increasing interest in open government data and their willingness to monitor government activities

are positive indicators for the future of e-governance in the country. However, addressing existing challenges requires strategic policy interventions to ensure the long-term success of e-government initiatives. Some of the policy recommendations from the study's findings should include:

Infrastructure Development: The government should prioritize investment in stable electricity supply, nationwide broadband expansion, and ICT infrastructure to support the seamless functioning of e-government services. Public-private partnerships (PPPs) could be leveraged to accelerate digital infrastructure projects.

Strengthening Digital Literacy: A national digital literacy program should be developed to enhance the ICT skills of government employees and citizens. Training initiatives should focus on increasing digital competency, ensuring all stakeholders can effectively engage with e-government services.

Anti-Corruption Measures: The implementation of e-government solutions should be accompanied by robust anti-corruption frameworks, such as blockchain-based public procurement and automated financial tracking systems, to minimize opportunities for fraud and enhance accountability.

Policy Enforcement and Political Commitment: The Nigerian government must demonstrate strong political will by consistently implementing e-government policies. This includes setting clear, enforceable regulations, monitoring compliance across ministries and agencies, and establishing independent oversight bodies to track progress.

Open Government Data Enhancement: The government should improve the accessibility, reliability, and frequency of open data updates, ensuring citizens can actively monitor public expenditures, policies, and service delivery. Open government initiatives should be integrated with feedback mechanisms to promote citizen engagement and trust.

Cybersecurity and Data Protection Policies: Strengthening cybersecurity laws and data protection policies is essential to ensure the security of e-government systems. Policies should include strict guidelines on data privacy, system security, and risk management to prevent cyber threats and unauthorized access to sensitive information.

User-Cantered Service Design: E-government platforms should be designed with user-friendliness in mind, ensuring they are accessible to individuals with varying levels of digital literacy. Incorporating citizen feedback into the design and continuous improvement of e-government services will enhance adoption and usability.

By implementing these policy recommendations, Nigeria hopes to overcome the existing barriers to e-government adoption and fully harness the benefits of digital governance. A well-executed e-government strategy has the

potential to drive public sector efficiency, foster greater transparency, and improve citizen engagement in governance processes, ultimately contributing to national development.

While this study offers valuable insights into the impact and challenges of e-government in Nigeria, its findings have broader implications for global e-governance, particularly in developing countries. The lessons from Nigeria's experience can serve as a reference for other nations, helping them anticipate and mitigate similar challenges in their digital governance initiatives. To build on these findings, further research should explore specific areas that are critical to the successful implementation of e-government.

One key area for future research is cybersecurity in e-government systems. As governments increasingly digitize public services, the risk of cyber threats, data breaches, and digital fraud rises. Investigating cybersecurity best practices, risk management strategies, and government capacity to secure digital platforms is crucial. Comparative studies between Nigeria and countries with advanced cybersecurity frameworks could identify gaps and recommend solutions to enhance the resilience of e-government systems.

Another crucial avenue for research is citizen trust and engagement with e-government services. Trust in digital governance plays a vital role in adoption rates and public willingness to use e-government platforms. Future studies should assess the relationship between transparency measures, data protection policies, and citizen trust levels in government institutions. Longitudinal studies tracking public confidence in e-government over time could provide insights into how policy adjustments and technological advancements impact citizen engagement.

Additionally, comparative policy analysis between Nigeria and other nations both developed and developing can offer valuable lessons on effective e-government implementation. Examining policy frameworks, regulatory environments, and governance structures in countries with successful digital transformation can help Nigeria refine its strategies. Research could focus on how legislative backing, political commitment, and inter-agency collaboration influence the effectiveness of e-government adoption.

Further research should also assess the socio-economic impact of e-government, particularly in relation to regional disparities and digital inclusion. Studies evaluating how e-government affects marginalized populations, rural communities, and small businesses would provide data-driven insights to enhance equitable digital service delivery. Moreover, cost-benefit analyses of existing e-government programs could inform resource allocation and policy decisions to ensure sustainable implementation.

By addressing these areas, future research can contribute to strengthening e-government strategies globally, improving public service delivery, fostering citizen engagement, and enhancing governance efficiency in diverse national contexts.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest

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