# Innovations

## Impact of Resistance Factors and Implementation Challenges on Digitalization Adoption in the Public Sector in Nigeria

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***Abstract:*** *This study investigates the impact of resistance factors and implementation challenges on digitalization adoption in Nigeria's public sector. This study will employ a cross-sectional survey design to collect quantitative data on resistance factors and implementation challenges. With a sample size of 379 and utilizing a regression analysis, the research examines the influence of infrastructural deficits (ID), technological capabilities (TC), bureaucratic inertia (BI), and organizational resistance (OR) on digitalization efforts. Regression results indicate that infrastructural deficits and technological capabilities significantly promote digitalization adoption, with standardized coefficients of 0.150 and 0.283, respectively. Conversely, bureaucratic inertia and organizational resistance negatively impact digitalization, with Beta values of 0.234 and 0.172, respectively. The model explains 46% of the variance in digitalization adoption (Adjusted R Square = 0.460). The findings underscore the critical role of enhancing infrastructure and technological capabilities while addressing bureaucratic and organizational resistance to improve digital transformation in the public sector. Recommendations include investing in infrastructure, boosting technological capabilities, streamlining administrative processes, and implementing effective change management strategies to foster a conducive environment for digitalization.*

***Keywords:*** *Digitalization Adoption; Infrastructural Deficits; Technological Capabilities; Bureaucratic Inertia; Organizational Resistance*

## 1. Introduction

Global governance has undergone a profound transformation due to the digital revolution, which has brought about more openness, efficiency, and public involvement. This potential is never more apparent than in Nigeria, a country facing complex administrative issues due to an expanding population. But even

with government initiatives to embrace digital transformation, the public sector faces significant implementation challenges and opposition. These obstacles prevent the smooth integration of digital solutions and impede the modernization of public services. They vary from technical limits and inadequacies in infrastructure to organizational opposition and bureaucratic inertia (Warrick, 2023; Bjerke-Busch & Aspelund, 2021).

Nigeria must overcome these obstacles to fully benefit from digitization and maximize its influence on service delivery and governance. However, the body of research on digital adoption in Nigeria's public sector is still lacking in a thorough examination of the nation's unique implementation obstacles and resistance factors (Shamaki, Ibrahim & Azu, 2022). This knowledge gap highlights the urgent need for empirical research that helps stakeholders and policymakers embrace and execute digital projects more successfully by not only identifying these barriers but also providing them with useful insights (Samsor, 2020).

The public sector in Nigeria has many obstacles to the smooth integration of digital solutions, including implementation issues and reluctance to digital technology adoption. These barriers include bureaucratic inertia, organizational opposition, and technical limitations as well as deficiencies in infrastructure (Bjerke-Busch & Aspelund, 2021). These obstacles still exist in spite of the government's dedication to digital transformation, which is impeding attempts to update public services and enhance governance results. Therefore, in order to support the effective adoption and execution of digitalization projects in Nigeria's public sector, it is imperative that these impediments be identified and addressed (Elsafty& Yehia, 2023; Igbokwe-Ibeto, 2019).

Nevertheless, a thorough examination and analysis of the unique obstacles and implementation difficulties that are common in Nigeria are absent from the body of research currently available on the adoption of digitalization in that nation's public sector (Samsor, 2020). Few studies have explicitly addressed the challenges encountered in the Nigerian setting, despite some touching on more general themes of digital transformation and e-governance deployment. Furthermore, the relevance of current research to real-world situations is limited due to its frequent dependence on theoretical frameworks and dearth of empirical data (Twizeyimana, Larsson, & Grönlund, 2018). Thus, in order to provide policymakers, public servants, and stakeholders useful information, empirical research that digs deeper into the subtleties of resistance causes and implementation issues is desperately needed.

Moreover, longitudinal studies are required to monitor the development of digitization projects over time and evaluate their influence on the results of governance and public happiness (Sonhaji, Anityasari&Mahendrawathi, 2024).

Through an analysis of the development of digitalization initiatives and their consequences for public service delivery, these studies may provide important information on the efficacy of existing tactics and guide future policy choices. Furthermore, studies that compare Nigeria's public sector to other nations or areas going through comparable digital transformation processes might provide insightful knowledge and best practices (Hinings, Gegenhuber, & Greenwood, 2018). Through the use of global standards and international experiences, Nigeria may expedite its digital transformation process and more efficiently tackle its principal obstacles.

In light of the above developments, this research work tends to (i) assess the influence of infrastructural deficits on technological adoption in selected parastatal in Nigeria (ii) evaluate the impact of technological Capabilities on technological adoption in selected parastatal in Nigeria (iii) examine the bureaucratic Inertia (BI), Organizational Resistance (OR)

Literature surrounding digital adoption in Nigeria's public sector are notable for their lack of comprehensive exploration and analysis of the specific resistance factors and implementation challenges prevalent within the country (Sonhaji, et al., 2024; Elsafty& Yehia, 2023; Nadkarni &Prügl, 2021; Bjerke-Busch & Aspelund, 2021). While existing studies touch upon broader issues of e-governance implementation and digital transformation, they often lack empirical evidence and rely heavily on theoretical frameworks, limiting their applicability to real-world contexts (Igbokwe-Ibeto, 2019). These gaps highlight the critical need for empirical research that delves deeper into the nuances of resistance factors and implementation challenges to provide actionable insights for policymakers and stakeholders, thus accelerating Nigeria's digitalization journey.
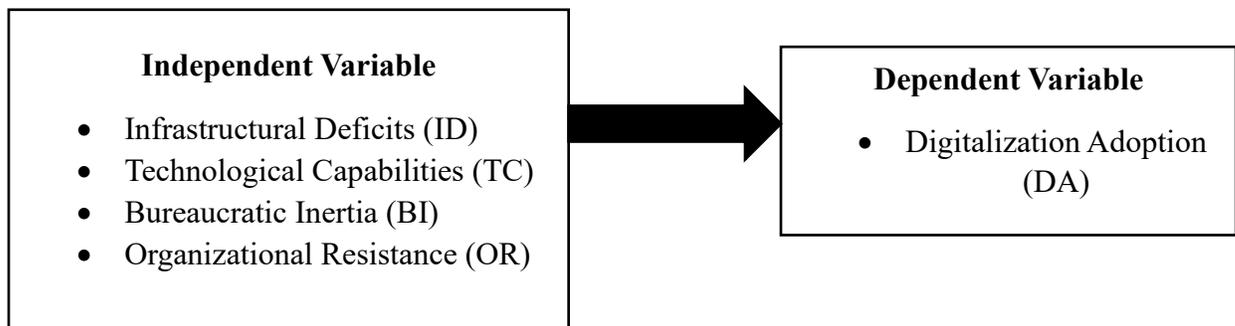
This research will examine the Impact of Resistance Factors and Implementation Challenges on Digitalization Adoption in the Public Sector in Nigeria. It tends to target 10 regulatory agencies in Nigeria. The key regulatory agencies with head offices in Abuja Nigeria used for this study include Central Bank of Nigeria (CBN), National Agency for Food and Drug Administration and Control (NAFDAC) and Nigerian Communications Commission (NCC). These regulatory agencies play crucial roles in ensuring compliance, consumer protection, safety, and promoting fair practices within their respective sectors in Nigeria.

## 2. Literature Review

The adoption of digitalization in Nigeria's public sector is being examined from a conceptual, theoretical, and empirical perspective in order to identify implementation obstacles and resistance reasons. The degree to which people, groups, or societies incorporate digital technology into their daily routines, procedures, and frameworks is referred to as digitalization adoption. It includes

implementing and making use of digital platforms and technologies to automate, digitize, and improve a range of processes, activities, and services (Azu &Nwauko, 2021). Deficits in physical infrastructure, such as energy systems, communication networks, and transportation networks, within a certain area or region are referred to as infrastructure deficits. These inadequacies obstruct the growth of technology and digitalization projects, restrict access to necessary services, and inhibit economic development (Okpalaoka, 2021). The knowledge, talents, and resources that people, organizations, or society possess to efficiently create, implement, and use technology are referred to as technological capabilities.

According to Shamaki, Ibrahim, and Azu (2022) these competencies include technical proficiency, the capacity for invention, and the flexibility and ability to take advantage of technology developments in order to accomplish desired results and goals. The reluctance to change or the slowness with which bureaucratic systems adopt new policies, practices, or technological advancements is known as bureaucratic inertia. It often stems from deeply ingrained corporate cultures, procedures, and structures that value continuity and stability above creativity and adaptability. (Bjerke-Busch & Aspelund, 2021; Warrick, 2023). The unwillingness or disagreement that exists inside an organization to accept or execute changes, including new procedures, tactics, or technology, is referred to as organizational resistance. It often results from things like worries about upsetting established processes, fear of losing one's job, or concerns about perceived challenges to current power structures. Ibrahim & Archibong, 2021).

| **Independent Variable** | **Dependent Variable** |
|---|---|
| • Infrastructural Deficits (ID)<br>• Technological Capabilities (TC)<br>• Bureaucratic Inertia (BI)<br>• Organizational Resistance (OR) | • Digitalization Adoption (DA) |

The Institutional Theory is one of several theories that are pertinent to this study project. This theory focuses on how organizational behaviour and decision-making are shaped by institutional influences. Analysing how current institutional structures and norms within the Nigerian public sector impact acceptance or resistance to digital innovations might be useful in the context of digitalization adoption. A popular hypothesis in information systems research, the Technology Acceptance Model (TAM) describes why people accept new

technologies depending on how convenient and beneficial they are seen to be (Azu &Nwauko, 2021). The theories of change management provide frameworks for comprehending how businesses manage and carry out change initiatives. The stages of digital transformation in the Nigerian public sector could be analysed, potential sources of resistance could be identified at each stage, and strategies for overcoming them could be developed using models like Lewin's Change Management Model or Kotter's Eight-Step Process for Leading Change (Archibong & Ibrahim, 2021).

The Diffusion of Innovations Theory investigates how novel concepts, methods, and tools proliferate within a community or institution (Azu &Nwauko, 2021). It might be used to analyse the spread of digital technologies in the Nigerian public sector, considering the roles of innovators, early adopters, and laggards, in the context of digitalization adoption. Resource Dependency Theory is also applicable in certain cases. This theory looks at how businesses rely on connections and outside resources to accomplish their objectives. It might be used to examine how dependent the Nigerian public sector is on outside parties, including technology providers, governmental organizations, and foreign partners, in the context of digitalization adoption.

## 2.2 Theoretical Framework

According to Davis's (1989) Technology Acceptance Model (TAM), an individual's degree of assimilation is determined by their willingness and choice to learn and utilize a technology (Azu &Nwauko, 2021). When analyzing the TAM model, it is considered that consumption is rational and that one should consider all options before deciding. In describing attitudes and illuminating the components that underlie purposefully selected attitudes, the model is perceptive and intuitive. TAM is relevant to this research because it illuminates stakeholders' attitudes and intentions about the adoption of digitalization in the Nigerian public sector. TAM focuses on the perceived utility and usability of digital technology. On the other hand, Lewin's Change Management Model is pertinent because it provides a framework for examining the phases of digital transformation, identifying the causes of change resistance, and formulating strategies to overcome implementation challenges. All of these steps help to guarantee that digital initiatives are effectively implemented (Archibong & Ibrahim, 2021).

## 2.3 Empirical Review

The digital transformation process of Indonesia's Surabaya City Office for Population Administration and Civil Registration (COPACR) was examined by Sonhaji, Anityasari, and Mahendrawathi(2024). Through the use of a mixed-

method approach that included qualitative and quantitative approaches, the research was able to identify external and internal impediments that are pertinent to the COPACR sector's adoption of digital transformation. The researchers identified 63 obstacles in all, 33 internal and 30 externals, by analysing twenty literature sources and doing Focus Group Discussions (FGDs) with Top Management and Field Officers. Expert choice tools and the Analytic Hierarchy Process (AHP) technique were used to establish priority barriers. Results showed that the digital transformation process was severely hampered by both external and internal hurdles, such as rigid laws and poor money allocation, as well as low staff engagement and officer competence.

The effects of digital transformation in Egypt's public sector were examined by Elsafty& Yehia (2023), who concentrated on the variables affecting employee behaviour and how they affected the transformation process. Employing a quantitative methodology that included government officials completing self-administered questionnaires, the research determined that leadership, effective communication, work culture, education, and skill sets were important determinants of employee behaviour. It has been discovered that positive employee behaviour speeds up digital transformation initiatives, whereas bad behaviour presented serious challenges.

The influence of national cultural variations on resistance to digitization in multinational businesses (MNEs) was investigated by Aziz &Twagirayezu (2023). The study carried out comparative research among management accountants engaged in multinational enterprises (MNEs) operating in several countries within the automotive and logistics sectors, using Hofstede's theory of cultural dimensions. The results demonstrated the importance of organizational culture, especially in cross-cultural settings, in handling opposition to digital changes.

Verhoef et al. (2021) divide DT into three stages: digitization, digitalization, and transformation. They investigate how DT affects consumer behaviour and corporate structures. They outline digital businesses' growth objectives and draw attention to the resources and skills needed for a successful digital transition. The authors stress that in order to meet the difficulties presented by DT, certain organizational structures and performance measures are required. Their research agenda is to advance knowledge of the competencies required to effectively allow digital transformation (DT) by offering insights into the evolutionary patterns and hierarchies of DT.

Wu, Kozanoglu, Min, and Zhang (2021) provide a unique bibliometric approach in response to the dearth of quantitative data driving DT. They classify the skills necessary for DT success and discover evolutionary trends in over 10,000 scholarly publications and patents pertaining to the technology. For managers starting their DT journey, the framework offers a thorough grasp of DT from a

quantitative viewpoint, along with useful insights. The authors help close the gaps in DT research and provide direction for practitioners by presenting a process-based view of DT and emphasizing key enabling skills.

Samsor (2020) concentrated on the difficulties and impediments to the adoption of e-Government in poor nations, with a particular focus on Afghanistan. Utilizing a blend of theoretical and empirical methodologies, such as quantitative surveys and expert interviews from public and private establishments, the research delineated impediments such coordination, ICT literacy, e-Government awareness, and stakeholder participation. It was discovered that these difficulties seriously hindered the execution of e-Government projects. The research emphasized how critical it is to remove these barriers in order to improve the efficacy of e-Government deployment in developing nations such as Afghanistan.

58 peer-reviewed articles were thoroughly analysed by Nadkarni and Prügl (2021) in order to determine the main components and topics of DT. They produced inductive thematic maps, emphasizing the two aggregate dimensions—technology and actor. Nine primary themes were identified throughout each dimension, highlighting the significant causes and effects of DT processes. In order to improve the management viewpoint and handle undeveloped elements like transformation speed and cultural effects, cross-disciplinary contributions were also included.

From 2004 to 2013, Rodriguez-Crespo, Marco, and Billon (2021) looked at how ICT affected the dynamics of bilateral trade. They examined data from 55 countries—21 low- and middle-income countries and 34 high-income countries—using a gravity model approach. It showed that ICT had a positive and significant impact on bilateral trade, albeit the exact proxy used varied. Additionally, it was shown that the impact of ICT use is greater for mobile phones and less for broadband, with the exporter bearing a greater share of the consequences than the importer. In a similar vein, Billon, Rodríguez-Andrés & Rodriguez-Crespo (2023) noted that the adoption of broadband has a beneficial and considerable influence on international business, particularly with respect to trade flows inside Africa. Additionally, it was shown that broadband lessened the negative impacts of export and import periods in the context of transactions between intra-SSA countries. The data covers ninety-three countries between 2004 and 2018, of which twenty-five are in sub-Saharan Africa.

The institutional viewpoint is suggested by Hinings, Gegenhuber, and Greenwood (2018) as a popular lens for examining digital innovation and transition. They highlight the development and use of innovative goods and services, proposing three categories of innovative institutional configurations that are essential to digital transformation (DT): digital organizational structures,

digital institutional frameworks, and digital institutional components. This viewpoint emphasizes how crucial it is to look at how these arrangements fit into existing institutional frameworks and achieve societal acceptance. The authors also counter the disruptive rhetoric surrounding DT, emphasizing the difficulties in institutionalization and the critical role that preexisting arrangements play in deciding the acceptability of new ones.

The obstacles of e-government implementation in Rwanda were examined by Twizeyimana, Larsson, and Grönlund (2018). The study focused on the Government of Rwanda's continuing endeavour to digitalize all G2C and G2B services into a single window platform. The researchers identified six main categories of obstacles, including information infrastructure, social inclusion, governance, management, faith in the new system, and language hurdles, using interpretative case study technique incorporating interviews and participatory observations. The report stressed how crucial it is to take note of other nations' experiences and use appropriate tactics, such public-private partnerships, in order to overcome these obstacles and succeed with e-government.

The prospects and difficulties of implementing digital transformation in the Nigerian public sector were examined by Igbokwe-Ibeto (2019). The research collected information from secondary sources, highlighting obstacles such a lack of digital skills, political dynamics, and infrastructural deficiencies, using the Technology Acceptance Model (TAM) as a guide. Prioritizing the development of digital skills, infrastructure, and supporting policies were among the suggestions made to get over these obstacles and boost productivity and service delivery in the Nigerian public sector.

This thorough analysis of empirical research offers insightful information on the prospects and difficulties related to e-government and digital transformation projects in several settings. Every research adds distinct viewpoints and insights that deepen our comprehension of the challenges associated with executing digital projects in public sectors globally.

According to Bjerke-Busch and Aspelund (2021), the last ten years have seen a significant increase in organizational changes as a result of the general availability of inexpensive digital tools and the use of new technology by enterprises and institutions to increase productivity. The public sector has been slower to adopt new technology than the private sector, despite the fact that it stands to gain much from digitization. The research used an institutional approach and change management theory to examine the particular obstacles impeding digital transformation in the public sector, with a focus on the Norwegian Court Administration. The results indicate that institutional norms provide a substantial obstacle to organizational change, resulting in individual resistance and hindering the digital transformation process.

The gaps in the literature surrounding digital adoption in Nigeria's public sector are notable for their lack of comprehensive exploration and analysis of the specific resistance factors and implementation challenges prevalent within the country(Sonhaji, et al., 2024; Elsafty& Yehia, 2023; Nadkarni &Prügl, 2021; Bjerke-Busch & Aspelund, 2021).While existing studies touch upon broader issues of e-governance implementation and digital transformation, they often lack empirical evidence and rely heavily on theoretical frameworks, limiting their applicability to real-world contexts(Igbokwe-Ibeto, 2019).. These gaps highlight the critical need for empirical research that delves deeper into the nuances of resistance factors and implementation challenges to provide actionable insights for policymakers and stakeholders, thus accelerating Nigeria's digitalization journey.

## 3. Methods

The research method in this study predominantly relies on quantitative data to comprehensively investigate the impact of resistance factors and implementation challenges on digitalization adoption in the public sector in Nigeria. A survey research design was instrumental to this research. Surveys are administered to staff of the selected institutions, to gather quantitative insights into their perceptions and experiences regarding digitalization adoption(Shamaki, Ibrahim & Azu, 2022). The survey instrument is meticulously designed to assess various resistance factors and implementation challenges identified in the literature, employing five-point Likert-scale items to measure respondents' attitudes and opinions(Yusuf,Rabiu,Taryam&Azu, 2023; Archibong & Ibrahim, 2021). Additionally, objective indicators of digitalization adoption, such as the level of technology integration and usage within government agencies, are quantitatively captured to provide empirical evidence of the phenomenon.

Statistical analysis techniques, notably regression analysis, are employed to analyse the quantitative data collected from the surveys. Regression models are used to examine the relationships between resistance factors, implementation challenges, and levels of digitalization adoption within the Nigerian public sector. By quantifying these relationships, the study aims to identify significant predictors of digitalization adoption and assess the magnitude of their impact (Shamaki, Ibrahim & Azu, 2022; Samsor, 2020). Moreover, statistical tests for significance and robustness checks are conducted to ensure the validity and reliability of the quantitative findings. The emphasis on quantitative data allows for rigorous analysis and objective measurement of the factors influencing digitalization adoption, providing valuable insights for policymakers and

practitioners seeking to overcome barriers and accelerate digital transformation efforts in Nigeria's public sector.

## 3.1 Population and Sample Determination

The population of this study include the staff of the Central Bank of Nigeria (3003), National Agency for Food and Drug Administration and Control (2229) and Nigerian Communications Commission (2102) which give a total of 7334.

| S/No | Financial Institution | Population | Sample |
|------|----------------------|------------|--------|
| **Table 1 Sample Distribution** | | | |
| S/No | Financial Institution | Population | Sample |
| 1 | Central Bank of Nigeria (CBN) | 3003 | $\frac{3003}{7334} * 379 = 155$ |
| 2 | National Agency for Food and Drug Administration and Control (NAFDAC) | 2229 | $\frac{2229}{7334} * 379 = 115$ |
| 3 | Nigerian Communications Commission (NCC). | 2102 | $\frac{2102}{7334} * 379 = 109$ |
| | Total | 7334 | 379 |

Sample size is the part of the population that was selected for the study. The Taro Yamane 1967 sample size determination as follows;

$$n = \frac{N}{1 + N(e)^2}$$

Where, n = sample size

N = population (6149)

1 = Unity (a constant)

(e)$^2$ = level of significance ((e) = 0.05)

$$n = \frac{7334}{1 + 7334(0.05)^2}$$

$$n = \frac{7334}{1 + 7334 * 0.0025} = \frac{7334}{1 + 18.335} = \frac{7334}{19.335} = 379$$

The sample size for the study is 379 which are distributed prorate based on the size of the organisation. The sample distribution is presented in Table 1.

## 3.2 Model Specification

To analyse the impact of resistance factors and implementation challenges on digitalization adoption in the public sector in Nigeria, a multivariate regression model can be specified. The dependent variable would be the level of digitalization adoption, measured as a continuous variable representing the extent to which digital technologies are integrated into public sector operations. The independent variables would include various resistance factors and

implementation challenges identified in the literature, such as infrastructural deficits, technological capabilities, bureaucratic inertia, and organizational resistance(Shamaki, Ibrahim & Azu, 2022).

The model can be specified as follows:

$$DA = \beta_0 + \beta_1 ID_i + \beta_2 TC_i + \beta_3 BI_i + \beta_4 OR_i + \varepsilon_i \qquad (1)$$

Where:

Digitalization Adoption (DA): The dependent variable representing the level of digitalization adoption in the public sector, measured using a composite index or scale derived from survey responses or objective metrics.

Infrastructural Deficits (ID), Technological Capabilities (TC), Bureaucratic Inertia (BI), Organizational Resistance (OR) are the independent variables representing various resistance factors and implementation challenges, measured using Likert-scale survey items or objective indicators.

$\beta 0$: The intercept term representing the expected level of digitalization adoption when all independent variables are zero.

$\beta 1$-$\beta 4$: The regression coefficients representing the expected change in digitalization adoption for a one-unit increase in each independent variable, holding other variables constant.

$\varepsilon$: The error term representing unobserved factors influencing digitalization adoption not accounted for in the model.

### 3.3 Sources and Method of Data Collection

This research employed a self-made five-point Likert scale. Questions were framed and closed-ended to gather data. We quantified and displayed participant data. Since they are original, primary data are correct and current (Yusuf, Rabiu, Taryam& Azu, 2023). Questionnaires gathered large samples of data. It saves time, money, and anonymizes replies.

The questionnaire supplied all trial data. A 5-point Likert scale, with 1 point for "strongly disagree" and 5 for "strongly agree," measured the data. A Likert scale measures respondents' beliefs, perceptions, attitudes, and actions, according to Abidin et al. (2020) and Oktaviani&Mandasari (2020). Participants may agree or disagree with a claim (Shamaki, Ibrahim & Philemon, 2022; Yusuf, et al., 2023).

| Variables | **Table 2 Pilot Reliability Statistics** | | |
|---|---|---|---|
| | Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
| Digital Adoption | 0.814 | 0.794 | 10 |
| Infrastructural Deficits | 0.822 | 0.801 | 10 |
| Technological | 0.807 | 0.769 | 10 |

| | | | |
|---|---|---|---|
| Capabilities | | | |
| Bureaucratic Inertia | 0.846 | 0.811 | 10 |
| Organizational Resistance | 0.826 | 0.797 | 10 |
| Sources: Author's Computation using SPSS 27, 2024 | | | |

## 3.4 Method of Data Analysis

Descriptive statistics such as frequency distribution and figures will be used to analyse participants' demographic characteristics such as number of employees, years of work experience while Multiple Regression analysis will be adopted to test the hypotheses with the aid of the IBM statistical package for social sciences (SPSS 27).

## 3.5 Validity and Reliability of Research Instrument

The designed questionnaire was first vetted and pre-tested by experts, who made no further recommendations. The questionnaire was subjected to a reliability and validity test. Cronbach Alpha will be used to determine the reliability of the research instrument.The estimated Cronbach's Alpha for pilot testing is reported in Table 2. The reported Cronbach's Alpha is the average of each variable which includes Digital Adoption (0.814), Infrastructural Deficits (0.822), Technological Capabilities (0.807), Bureaucratic Inertia (0.846), and Organizational Resistance (0.826) Each of the reported Cronbach's Alpha is within the acceptable level and therefore should be used for the estimation.

| Table 3 Analysis of Questionnaire Return Rate | | | | |
|---|---|---|---|---|
| Responses | Questionnaires Administered | Questionnaires not Returned | Questionnaire Returned | Percentage (%) |
| Male | 207 | 19 | 188 | 54.65 % |
| Female | 172 | 16 | 156 | 45.35 % |
| **Total** | **379** | **35** | **344** | **100 %** |

Source: Field Survey, (2024)

## 4 Data Presentation, Analysis, and Interpretation
## 4.1 Overview of Data Collection

The analysis of the questionnaire return rate reveals that out of 379 questionnaires administered, 344 were returned, resulting in a high overall return rate of 90.76%. Specifically, 207 questionnaires were given to male respondents, with 188 returned, yielding a return rate of 54.65%. Meanwhile, 172

questionnaires were administered to female respondents, with 156 returned, resulting in a return rate of 45.35% (See Table 3). This data indicates a slightly higher engagement from male respondents compared to female respondents. The relatively high overall return rate suggests effective respondent engagement, though the minor difference in return rates between genders may warrant further exploration into response behaviours or accessibility factors.
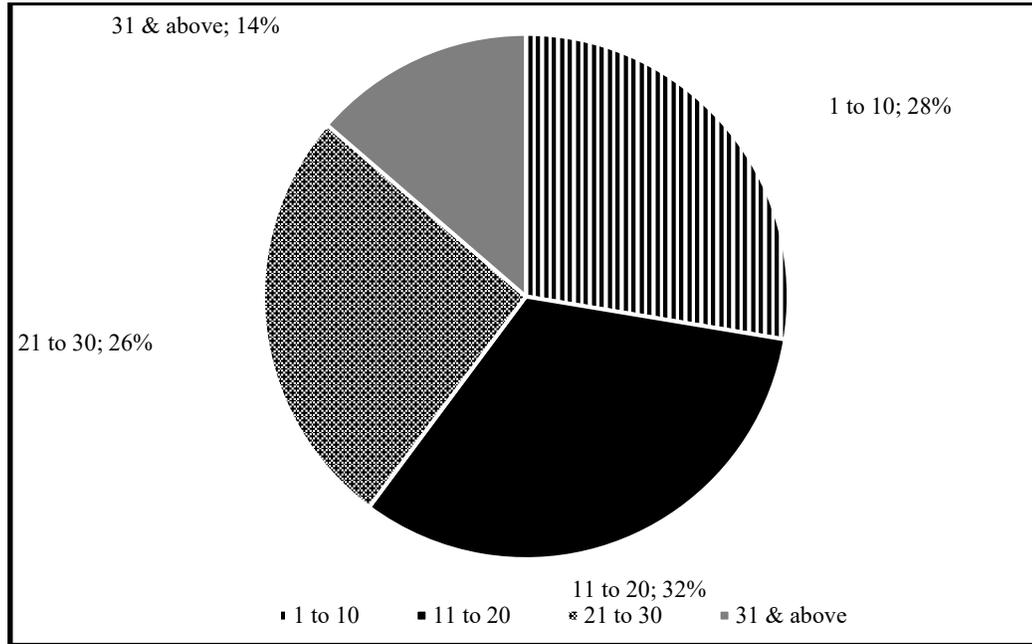


Figure 1: Respondents Duration of Service

Figure 1, titled "Duration of Service," outlines the number of employees at a company categorized by their years of service, giving insight into the workforce's composition and the organization's retention dynamics. The data is displayed in three columns, indicating the range of service years, the number of employees in each range, and the percentage of the total workforce they represent. It shows that 95 employees, or approximately 27.62% of the workforce, have been with the company between 1 and 10 years. This segment could indicate relatively recent hiring trends or possibly high turnover rates in the initial years. Following this, the largest group consists of 112 employees who have served between 11 and 20 years, making up 32.56% of the staff, highlighting a core of experienced employees who likely hold pivotal roles within the company.

The next category captures those who have been with the company for 21 to 30 years, including 90 employees, or 26.16% of the workforce. This substantial proportion reflects the organization's ability to retain its staff long-term, possibly due to favourable employment conditions, advancement opportunities, or effective engagement strategies. The longest-serving employees, those with over 31 years at the company, account for 47 staff members, or 13.66% of the

total workforce. This group, though smaller, signifies a segment of highly experienced and potentially foundational personnel who have contributed to the stability and continuity of the company. Overall, the distribution across different tenure lengths suggests a balanced approach to employee recruitment and retention, fostering a diverse and experienced workforce capable of sustaining the organization's operations and growth..
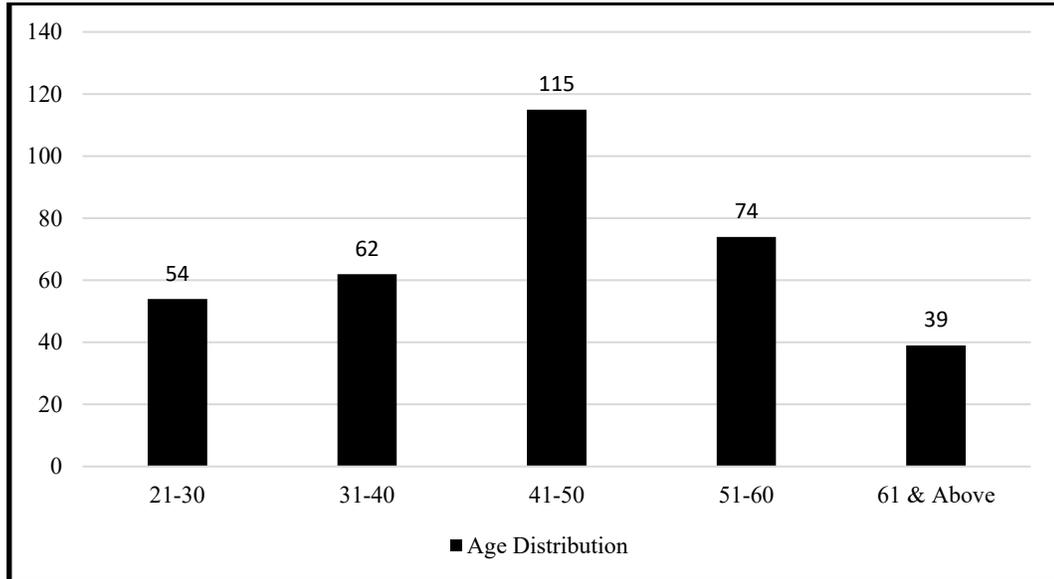


Figure 3: Age Distribution of the Respondents

The Figure 2 titled "Age Distribution" provides a detailed demographic breakdown of a group or organization's workforce, segmented into five age ranges. The distribution reveals a broad spectrum of ages, starting with the youngest cohort, those aged 20-30, who make up 15.70% of the workforce, reflecting the presence of entry-level and early-career professionals. Following this group are the 31–40-year-olds, who comprise 18.02% of the total workforce, indicating a segment of employees who are likely in the midst of advancing their professional careers and assuming more substantial responsibilities.

The most significant proportion of the workforce falls within the 41-50 age range, accounting for 33.43% of the total, suggesting a strong backbone of experience and likely dominance in senior management and leadership roles. The next age group, 51-60 years, represents 21.51%, indicating seasoned professionals who are approaching retirement but still hold key positions due to their expertise and experience. Finally, the 61 years and above group makes up 11.34% of the workforce, a vital segment that likely includes veteran employees who continue to contribute valuable knowledge and skills, potentially in advisory roles or part-time positions. This age distribution underscores the importance of strategic succession planning and the integration of younger talent to maintain a balanced and sustainable workforce.

**4.2 Pre-estimation Analysis**

The descriptive statistics for Digitalization Adoption (DA) and its related factors—Infrastructural Deficits (ID), Technological Capabilities (TC), Bureaucratic Inertia (BI), and Organizational Resistance (OR)—provide a snapshot of the central tendencies and variability within the data collected from 364 observations. Digitalization Adoption (DA) has a mean of 3.973 with a standard deviation of 0.6393, indicating that, on average, the level of digitalization adoption is relatively high, close to 4 on a scale from 1 to 5 (see Table 4). The standard deviation suggests moderate variability around this mean, implying that while most respondents have similar perceptions regarding digitalization adoption, there is some diversity in their experiences.

| Table 4 Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| Variables | Min | Max | Mean | Std. Deviation | N |
| DA | 1 | 5 | 3.973 | 0.6393 | 364 |
| ID | 1 | 5 | 3.9421 | 0.55288 | 364 |
| TC | 1 | 5 | 4.0152 | 0.49359 | 364 |
| BI | 1 | 5 | 3.9817 | 0.55906 | 364 |
| OR | 1 | 5 | 4.0004 | 0.5551 | 364 |
| Note: Digitalization Adoption (DA); Infrastructural Deficits (ID), Technological Capabilities (TC), Bureaucratic Inertia (BI), Organizational Resistance (OR) | | | | | |

Infrastructural Deficits (ID) have a mean of 3.9421 and a standard deviation of 0.55288. This mean value is also close to 4, indicating that respondents generally agree that infrastructural deficits are a significant issue. The standard deviation, slightly lower than that of DA, suggests that responses about infrastructural deficits are somewhat consistent among the participants.Technological Capabilities (TC) exhibit a mean of 4.0152 and a standard deviation of 0.49359, the highest mean among the factors and the lowest standard deviation. This indicates that most respondents rate technological capabilities highly and consistently, suggesting that there is general agreement on the adequacy of technological capabilities in the public sector.

Bureaucratic Inertia (BI) has a mean of 3.9817 with a standard deviation of 0.55906, showing that respondents typically perceive bureaucratic inertia to be present at moderately high levels. The standard deviation indicates moderate agreement among respondents about the level of bureaucratic inertia.Organizational Resistance (OR) has a mean of 4.0004 and a standard deviation of 0.5551. Like the other factors, the mean is around 4, showing a general consensus that organizational resistance is a prevalent issue. The

standard deviation is similar to those of ID and BI, suggesting a moderate level of agreement among the respondents regarding organizational resistance.

Overall, these descriptive statistics reveal that, on average, respondents perceive high levels of digitalization adoption and related factors, with moderate variability in their responses. This consistency suggests that the issues of infrastructural deficits, technological capabilities, bureaucratic inertia, and organizational resistance are commonly recognized and experienced across the sample, indicating their critical roles in digitalization adoption in Nigeria's public sector.

| Table 5 Correlations Matrix | | | | | |
|---|---|---|---|---|---|
| Variables | DA | ID | TC | BI | OR |
| DA | 1 | 0.473** | 0.597** | 0.604** | 0.533** |
| ID | 0.473** | 1 | 0.502** | 0.540** | 0.314** |
| TC | 0.597** | 0.502** | 1 | 0.610** | 0.554** |
| BI | 0.604** | 0.540** | 0.610** | 1 | 0.672** |
| OR | 0.533** | 0.314** | 0.554** | 0.672** | 1 |
| Note: Digitalization Adoption (DA); Infrastructural Deficits (ID), Technological Capabilities (TC), Bureaucratic Inertia (BI), Organizational Resistance (OR) | | | | | |

The correlation Matrix (Table 5) presents the relationships between Digitalization Adoption (DA) and four key factors: Infrastructural Deficits (ID), Technological Capabilities (TC), Bureaucratic Inertia (BI), and Organizational Resistance (OR). The correlations are marked with ** to indicate that they are statistically significant. The strongest positive correlation with DA is observed with Bureaucratic Inertia (BI) at .604, suggesting that as BI increases, DA also tends to increase. This might seem counterintuitive, as inertia typically hinders progress, but it could indicate that high levels of bureaucratic inertia might prompt significant efforts and reforms to adopt digitalization to overcome these hurdles.

Technological Capabilities (TC) show a strong positive correlation with DA at .597. This indicates that higher technological capabilities significantly enhance digitalization adoption, aligning with the expectation that better technology infrastructure and skills drive digital transformation. Similarly, Organizational Resistance (OR) has a positive correlation of .533 with DA, implying that higher organizational resistance might be associated with more significant digitalization efforts, perhaps due to efforts to combat this resistance. Infrastructural Deficits (ID) also positively correlate with DA at .473, indicating that addressing infrastructural challenges is crucial for enhancing digitalization adoption.

Among the independent variables themselves, there are notable correlations. Bureaucratic Inertia (BI) and Organizational Resistance (OR) have the highest correlation at .672, suggesting a strong relationship between these factors. This might mean that organizations with high bureaucratic inertia also face substantial resistance to change. Technological Capabilities (TC) are positively correlated with all other factors, particularly with BI (.610) and OR (.554), indicating that technological capabilities are intertwined with both the resistance factors. Infrastructural Deficits (ID) also show positive correlations with all variables, particularly with BI (.540) and TC (.502), highlighting the interconnected nature of infrastructural issues with other resistance and capability factors. These interrelationships suggest that efforts to improve digitalization adoption in the public sector should consider the complex interplay between these various factors.It was indicated by Azu, Jelivov, Aras, and Isik (2020) and Azu and Nwauko (2021) that when the independent variables are highly corrected, independent regression is suggested for each of the correlated variables.

## 4.3 Results and Discussion

The regression analysis in Table 6 provides a comprehensive evaluation of how various resistance factors and implementation challenges impact the adoption of digitalization in Nigeria's public sector. By examining infrastructural deficits (ID), technological capabilities (TC), bureaucratic inertia (BI), and organizational resistance (OR), the study aims to uncover the underlying dynamics that influence digital transformation within public institutions. Each of these variables offers unique insights into the barriers and enablers of digitalization.

**Table 6 Regression Analysis on the Impact of Resistance Factors and Implementation Challenges on Digitalization Adoption in the Public Sector in Nigeria**

| | Unstandardized Coefficients | | Standardized Coefficients | t-statistic | P-Value |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | -0.044 | 0.347 | | -0.127 | 0.899 |
| ID | 0.173 | 0.083 | 0.150 | 2.094 | 0.038 |
| TC | 0.367 | 0.101 | 0.283 | 3.622 | 0.000 |
| BI | -0.268 | 0.104 | 0.234 | -2.589 | 0.011 |
| OR | -0.198 | 0.094 | 0.172 | -2.114 | 0.036 |
| R Square | 0.473 | Adjusted R Square | 0.460 | Durbin-Watson | 2.075 |

> a. Dependent Variable: Digitalization Adoption (DA)
> b. Independent Variable: Infrastructural Deficits (ID), Technological Capabilities (TC), Bureaucratic Inertia (BI), Organizational Resistance (OR)

Starting with the constant term, the value of -0.044 with a standard error of 0.347 indicates a slight negative intercept when all independent variables are zero. This result is not statistically significant, with a p-value of 0.899. The high p-value suggests that the constant does not meaningfully contribute to the model's predictive power regarding digitalization adoption. This outcome implies that other factors outside of the model might also be at play or that the base level of digitalization without the influences of the specified variables is negligible.

Infrastructural deficits (ID) positively affect digitalization adoption, as indicated by an unstandardized coefficient of 0.173 and a standard error of 0.083. The standardized coefficient (Beta) of 0.150 shows a moderate positive influence on digitalization. The t-value of 2.094 and a p-value of 0.038 confirm that this relationship is statistically significant. This finding suggests that improvements in infrastructure, such as better internet connectivity, reliable power supply, and modern IT facilities, are crucial for enhancing digitalization efforts in the public sector. Addressing infrastructural gaps can thus play a vital role in facilitating the adoption of digital technologies.

Technological capabilities (TC) demonstrate a strong positive impact on digitalization adoption, with an unstandardized coefficient of 0.367 and a standard error of 0.101. The standardized coefficient (Beta) of 0.283 highlights a relatively strong effect. The t-value of 3.622 and the highly significant p-value of 0.000 underscore the importance of technological readiness. This result implies that having advanced technological infrastructure, skilled personnel, and up-to-date software and hardware significantly boosts the likelihood of successful digitalization. Investment in technological capabilities is therefore essential for the public sector to keep pace with digital advancements.

On the other hand, bureaucratic inertia (BI) has a negative impact on digitalization adoption, with an unstandardized coefficient of -0.268 and a standard error of 0.104. The standardized coefficient (Beta) of 0.234 indicates a substantial negative influence. The t-value of -2.589 and a p-value of 0.011 confirm the statistical significance of this effect. This finding suggests that bureaucratic inertia, characterized by rigid administrative processes, resistance to change, and slow decision-making, hinders digital transformation efforts. Reducing bureaucratic inertia by streamlining processes and fostering a culture of innovation is necessary to enhance digital adoption.

Similarly, organizational resistance (OR) negatively impacts digitalization adoption, as indicated by an unstandardized coefficient of -0.198 and a standard error of 0.094. The standardized coefficient (Beta) of 0.172 reflects a notable negative effect. The t-value of -2.114 and a p-value of 0.036 indicate that this relationship is statistically significant. This result suggests that resistance within organizations, such as reluctance to adopt new technologies, lack of support from management, and fear of change among employees, can significantly impede digitalization efforts. Effective change management strategies, including training, communication, and leadership support, are crucial to overcoming organizational resistance and promoting digital transformation.

Overall, the regression model explains a significant portion of the variance in digitalization adoption, with an R Square of 0.473 and an Adjusted R Square of 0.460. This means that approximately 46.0% of the variance in digitalization adoption can be explained by the independent variables in the model. The Durbin-Watson statistic of 2.075 suggests that there is no significant autocorrelation in the residuals, ensuring the reliability of the regression results. These findings highlight the importance of addressing infrastructural deficits, enhancing technological capabilities, and mitigating bureaucratic inertia and organizational resistance to foster digitalization in Nigeria's public sector.

## 5 Conclusion and Recommendations

The regression analysis reveals that infrastructural deficits and technological capabilities play significant roles in promoting digitalization adoption in Nigeria's public sector, whereas bureaucratic inertia and organizational resistance act as substantial barriers. The positive impact of infrastructural improvements and technological capabilities indicates that investments in these areas are crucial for successful digital transformation. Conversely, the negative impacts of bureaucratic inertia and organizational resistance highlight the challenges posed by rigid administrative processes and internal opposition to change. The model's ability to explain 46.0% of the variance in digitalization adoption underscores the importance of these factors in shaping digitalization outcomes.

To enhance digitalization adoption in Nigeria's public sector, it is recommended to prioritize infrastructure development, ensuring robust internet connectivity, reliable power supply, and modern IT facilities. Additionally, investments in technological capabilities, such as advanced software, hardware, and training for personnel, should be increased. To address bureaucratic inertia, public sector organizations should streamline administrative processes and foster a culture of innovation and agility. Finally, effective change management strategies should be implemented to overcome organizational resistance, including

comprehensive training programs, clear communication about the benefits of digitalization, and strong leadership support to encourage buy-in from all levels of the organization. These measures will collectively contribute to a more conducive environment for digital transformation.

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