# ICT and its contribution to economic growth and development in Nigeria

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## Abstract

Nigeria's economy continues to face structural challenges such as low productivity, inadequate infrastructure, and limited diversification beyond oil. In this context, Information and Communication Technology (ICT) has emerged as a potential driver of economic transformation, offering new opportunities for growth, innovation, and competitiveness. The study population comprised 75 people, including 25 UBA Magadisu staff and 50 ATM cardholders. Using stratified random sampling through a hat-drawn method, 20 staff and 34 customers were selected, following Ndagi's guideline for small populations. Data was sourced from questionnaires (primary) and internet documents (secondary). The questionnaire's validity was ensured through supervisor review and reliability tested with a pilot study of 10 GTB staff. Data collection was facilitated by the HR manager, with respondents given five days to complete the instrument. Analysis employed mean scores for Likert responses, percentages for demographics, and chi-square to test significance. The results revealed a fairly balanced gender distribution with slightly more females than males, while the majority of respondents were within the 31–50 years age range. Findings showed strong support for the importance of ICT in Nigeria's economy, with many agreeing that it contributes to growth and development. ICT awareness was also perceived as high, though doubts remained about its usefulness across all economic sectors. Chi-square analysis confirmed ICT's significant contribution to Nigeria's economic development. The study concludes that ICT is a transformative driver of progress in Nigeria, but its full potential can only be realized through enhanced awareness, equitable accessibility, and integration across sectors.

Keywords: ICT; economic growth; development; Nigeria; Chi-Square analysis

## Introduction

Despite Nigeria's large population and early ICT adoption in parts of the economy, structural bottlenecks, limited broadband penetration, uneven digital skills, weak regulatory frameworks, and infrastructure gaps, constrain the ICT sector's ability to deliver broad-based productivity gains and inclusive growth. Recent policy reforms and a rebased GDP that elevates digital services

have increased attention on ICT as a growth engine, but scholars and policymakers still disagree about the extent to which ICT translates into sustained jobs, higher productivity, and poverty reduction across Nigerian regions (Osabohien, 2024; World Bank, 2019; U.S. Int'l Trade Administration, 2025). These challenges highlight the ongoing debate about ICT's real impact on inclusive development, yet evidence from research increasingly points to its significant direct and indirect contributions to Nigeria's economic growth.

A consistent finding across institutional and academic studies is that ICT acts as both a direct and indirect contributor to economic growth. Directly, the ICT sector (telecoms, internet services, software and digital platforms) forms a significant and growing share of Nigeria's GDP and formal employment (U.S. Int'l Trade Administration, 2025; Nairametrics, 2025). Indirectly, ICT enables productivity improvements across agriculture, finance, education, and trade through digital payments, market information, and platform-mediated services (World Bank, 2019; World Bank blog, 2024). The World Bank's diagnostic emphasises five foundational elements — digital infrastructure, platforms, financial inclusion, entrepreneurship, and skills — each necessary to convert ICT investments into measurable economic outcomes (World Bank, 2019). Empirical work from country diagnostics and macro studies shows broadband and payments infrastructure, in particular, generate "digital spillovers" that raise firm-level productivity and broaden market access (Bontadini et al., 2024). Despite these promising contributions, the literature also underscores key limitations that hinder ICT's full potential, highlighting the need for complementary factors such as digital skills, regulatory support, and financial infrastructure to truly harness its economic benefits.

However, literature highlights important caveats. Several studies argue that gains from ICT are conditional: broadband alone does not deliver growth unless complemented by digital skills, supportive regulation (data protection, competition), and finance for SMEs (World Bank, 2019; U.S. Int'l Trade Administration, 2025). For example, diagnostic evidence notes Nigeria lags regional leaders in digital education outcomes and that uneven digital literacy limits adoption of e-commerce and e-government services (World Bank, 2019). Recent World Bank and policy briefs also emphasise that fintech expansion has dramatically increased financial inclusion and transaction efficiency, yet regulatory gaps and foreign-exchange instability create fragility for fintech firms and their users (Elsayed et al., 2024). Despite ICT's growing GDP share, national reports highlight that this growth alone doesn't ensure broad economic benefits without targeted policies.

National statistics and contemporary reporting further nuance the picture. Official aggregates and recent reporting show the ICT sector's share of GDP has risen significantly in the last few years, reflecting both growth in telecoms and an expanded statistical recognition of digital activities after GDP rebasing (U.S. Int'l Trade Administration, 2025; Financial Times, 2025). Analysts argue rebasing, which incorporated previously under-counted digital and informal services, increased the measured size of Nigeria's digital economy, but they caution that headline expansion does not automatically mean broad-based wellbeing improvements without targeted policies (Exton & Shinwell, 2018; Financial Times, 2025; Reuters, 2025). While ICT's growing contribution to GDP is clear, scholars emphasize that its broader benefits depend on targeted policies and effective integration across sectors.

Synthesis of scholarship on ICT highlights a dual pathway in understanding its role in Nigeria's development. On one hand, ICT has been firmly established as a driver of economic growth, contributing significantly to GDP, promoting fintech-led financial inclusion, and reducing transaction costs across sectors (World Bank, 2019; Khalifa, 2024; Nairametrics, 2025). The Nigerian ICT sector, particularly in telecommunications and digital payments, has expanded opportunities for businesses and improved service delivery in education, finance, and governance. Studies also show that ICT resources, when effectively integrated, enhance management efficiency and accountability in secondary schools, as evidenced in Anambra State (Manafa, Ohamobi, & Osegbue, 2022; Okafor, Ohamobi, & Manafa, 2021). Similarly, ICT utilization is associated with teacher professional development and improved job commitment, reinforcing the sector's wider social and institutional benefits (Ohamobi et al., 2024). While ICT clearly drives economic growth, its long-term success and inclusivity depend on addressing critical factors such as broadband access, digital literacy, and policy support.

On the other hand, the literature emphasizes that the sustainability and inclusiveness of ICT's benefits hinge on critical complementary factors. These include expanding broadband access, enhancing digital literacy, providing SME financing, and ensuring regulatory clarity to safeguard innovation (World Bank, 2019; U.S. International Trade Administration, 2025; World Bank, 2024). Nigerian educational studies reinforce this point: without strategic investment in teacher training, institutional support, and stress management for administrators, ICT gains are unlikely to translate into long-term productivity (Onyekazi et al., 2024; Oraegbunam & Ohamobi, 2025). Furthermore, Osegbue, Ohamobi, and Manafa (2019) argue that higher education and ICT adoption are vital for empowering youth and fostering sustainable development. Collectively, this evidence underscores that while ICT is a proven growth engine, its transformative potential in Nigeria depends on systemic integration with education, governance, and economic policy.

The motivation for study stems from the growing recognition of digital technologies as a catalyst for transformation, yet persistent gaps hinder their full impact. While ICT has emerged as a major driver of Nigeria's GDP, contributing over 17% in recent years (Nairametrics, 2025), challenges such as inadequate broadband penetration, uneven digital literacy, and regulatory weaknesses continue to limit its broader developmental role (World Bank, 2019). Despite ICT's significant contributions to Nigeria's GDP, persistent challenges such as unequal access and policy instability hinder its potential to drive inclusive growth.

Empirical evidence demonstrates that ICT adoption enhances productivity and financial inclusion across sectors (Khalifa, 2024), but benefits remain concentrated in urban centres, leaving rural populations and small enterprises underserved. In contrast, countries with more inclusive digital ecosystems have leveraged ICT for sustained job creation and poverty reduction (World Bank, 2023). Moreover, Nigeria's ICT sector is vulnerable to macroeconomic volatility and policy uncertainty, raising concerns about its sustainability as a growth engine (Oyadeyi, 2024; Reuters, 2025). These gaps highlight the need for a focused study that not only evaluates ICT's economic contributions but also examines structural barriers preventing equitable diffusion. Addressing these issues is essential to align ICT development with Nigeria's broader economic diversification and inclusive growth agenda.

This study aims to examine the impact of Information and Communication Technology (ICT) on Nigeria's economic growth and development, identify the ways in which ICT can contribute to economic growth and development, and determine the factors limiting the use of ICT across different sectors of the Nigerian economy. In line with these objectives, the study raises several research questions: what is the impact of ICT on Nigeria's economic growth and development, in what ways can ICT contribute to economic growth and development, and what are the factors limiting the utilization of ICT in all sectors of the Nigerian economy. To address these questions, the study sets out the following hypotheses: the null hypothesis (H0) states that ICT has not contributed to Nigeria's economic growth and development, while the alternative hypothesis (HA) states that ICT has contributed to Nigeria's economic growth and development.

## Method

The study population comprised 75 individuals, including 25 staff members of United Bank of Africa (UBA), Magadisu branch, Abuja, and 50 customers who had been issued ATM cards. A stratified random sampling technique, specifically the hat-drawn method, was employed to select 20 staff and 34 customers, resulting in a sample size of 54. This approach was guided by Ndagi's population and sampling table, a modification of Krejcie and Morgan's chart, which recommends that studies with populations under 100 adopt more than half as their sample size for reliability.

Both primary and secondary data sources were utilized. Primary data were collected through questionnaires designed by the researcher, while secondary data were obtained from internet-based documents. The questionnaire served as the primary instrument for gathering empirical field data, whereas secondary sources supported the literature review. To ensure validity, the supervisor evaluated the questionnaire's clarity, comprehensiveness, and appropriateness, and his input was incorporated into the final draft. Reliability was enhanced through a pilot study involving 10 respondents from GTB Magadisu branch, whose feedback refined the questionnaire before its final administration.

Data collection was carried out personally by the researcher, with assistance from the human resource manager of UBA. Questionnaires were distributed to respondents, who were given five days to complete them. This time allowance ensured that participants could reflect adequately on the questions and provide accurate responses. For data analysis, descriptive and inferential statistics were employed. Mean scores were used to analyze responses from the five-point Likert scale questionnaire, while frequency counts and simple percentages described respondents' demographic characteristics. The mean was calculated using the formula $\bar{x} = \sum fx$. Additionally, the chi-square test was applied to determine the significance of responses, particularly those from credit officers. The chi-square test involved defining categories, comparing observed and expected frequencies, and calculating significance using the formula: $Z^2 = \sum (Oi - Ei)^2 / Ei$, where Oi represents observed cases, Ei represents expected cases, and k denotes the number of categories.

**Results and Discussion**

*Bio Data of Respondents*

Table 1 shows the gender distribution of respondents. Out of a total of (54) participants, (25) were male, representing (46.3%) of the sample, while (29) were female, making up the majority at (53.7%). This indicates a slightly higher representation of females compared to males. The cumulative percentage confirms that females account for the remaining portion of the sample, bringing the total to (100%). The results suggest that both genders were fairly represented, although females contributed a larger share. This balance enhances the reliability of the study findings as it reflects perspectives from both male and female respondents.

Table 1. Gender of Respondents

|       |        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male   | 25        | 46.3    | 46.3          | 46.3               |
|       | Female | 29        | 53.7    | 53.7          | 100.0              |
|       | Total  | 54        | 100.0   | 100.0         |                    |

Table 2 presents the age distribution of respondents. Out of the total (54) participants, (4) respondents, representing (7.4%), were within the 15–20 years age range, while (10) respondents, making up (18.5%), fell between 21–30 years. The majority of respondents were in the 31–40 years category with (15) individuals, constituting (27.8%). Those aged 41–50 years accounted for the highest proportion with (20) respondents, representing (37.0%). Meanwhile, (5) respondents, equivalent to (9.3%), were above 50 years. The cumulative distribution indicates that the sample had more adult participants, particularly those aged 31–50 years, who made up (64.8%) of the respondents.

Table 2. Age Range of Respondents

|       |                | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | 15-20 years    | 4         | 7.4     | 7.4           | 7.4                |
|       | 21-30 years    | 10        | 18.5    | 18.5          | 25.9               |
|       | 31-40 years    | 15        | 27.8    | 27.8          | 53.7               |
|       | 41-50 years    | 20        | 37.0    | 37.0          | 90.7               |
|       | above 50 years | 5         | 9.3     | 9.3           | 100.0              |
|       | Total          | 54        | 100.0   | 100.0         |                    |

Table 3 shows the educational background of respondents. Out of (54) participants, (8) respondents, representing (14.8%), had FSLC qualifications, while (10) respondents, accounting for (18.5%), possessed WASSCE/NECO/GCE certificates. A larger proportion of the respondents, (18) individuals or (33.3%), attained OND/HND/B.Sc. qualifications. Similarly, another (18) respondents, also constituting (33.3%), had higher academic qualifications such as M.Sc., PGD, or Ph.D. The cumulative percentage indicates a progressive rise in educational attainment, with two-thirds (66.6%) holding tertiary education qualifications. This distribution suggests that the majority of respondents were well-educated, which is likely to enhance the quality and reliability of the data gathered.

Table 3. Educational Background of Respondents

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | FSLC | 8 | 14.8 | 14.8 | 14.8 |
|  | WASSCE/NECO/GCE | 10 | 18.5 | 18.5 | 33.3 |
|  | OND/HND/BSC | 18 | 33.3 | 33.3 | 66.7 |
|  | MSC/PGD/PHD | 18 | 33.3 | 33.3 | 100.0 |
|  | Total | 54 | 100.0 | 100.0 |  |

Table 4 presents the marital status of respondents. Out of a total of (54) participants, (24) respondents representing (44.4%), were single, while an equal number, (24) respondents or (44.4%), were married. In addition, (4) respondents, accounting for (7.4%), reported being divorced, and (2) respondents, equivalent to (3.7%), were widowed. The cumulative distribution shows that singles and married individuals together made up the overwhelming majority of (88.8%), while divorced and widowed respondents accounted for only (11.1%). This indicates that the study sample was dominated by individuals in the single and married categories, reflecting a balanced distribution between both groups.

Table 4. Marital Status of Respondents

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Single | 24 | 44.4 | 44.4 | 44.4 |
|  | Married | 24 | 44.4 | 44.4 | 88.9 |
|  | Divorced | 4 | 7.4 | 7.4 | 96.3 |
|  | Widowed | 2 | 3.7 | 3.7 | 100.0 |
|  | Total | 54 | 100.0 | 100.0 |  |

## *Tables based on Research Questions*

Table 5 shows respondents' views on the importance of ICT in Nigeria's economy. Out of (54) participants, (15) respondents, representing (27.8%), strongly agreed that ICT is important, while (20) respondents, making up the highest share at (37.0%), agreed. Meanwhile, (10) respondents, constituting (18.5%), were undecided. A smaller proportion of (5) respondents, equivalent to (9.3%), disagreed, and (4) respondents, representing (7.4%), strongly disagreed. The cumulative distribution indicates that a majority of (64.8%) supported ICT's relevance to Nigeria's economy, while only (16.7%) opposed it. This demonstrates a generally positive perception of ICT as a vital driver of economic development in Nigeria.

Table 5. ICT is Important Nigeria Economy

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Agree | 15 | 27.8 | 27.8 | 27.8 |
|  | Agree | 20 | 37.0 | 37.0 | 64.8 |
|  | Undecided | 10 | 18.5 | 18.5 | 83.3 |
|  | Disagree | 5 | 9.3 | 9.3 | 92.6 |
|  | Strongly Disagree | 4 | 7.4 | 7.4 | 100.0 |
|  | Total | 54 | 100.0 |  |  |

Table 6 presents respondents' opinions on whether ICT influences economic growth and development. Out of (54) participants, (15) respondents, representing (27.8%), strongly agreed, while (14) respondents, accounting for (25.9%), agreed. In contrast, (9) respondents, making up (16.7%), were undecided. On the other hand, (8) respondents each, representing (14.8%) respectively, disagreed and strongly disagreed. The cumulative distribution shows that a total of (53.7%) acknowledged ICT's influence on economic growth and development, while (29.6%) opposed it, with (16.7%) remaining neutral. This implies that although a majority recognized ICT's role in driving development, a considerable proportion expressed uncertainty or dissent.

Table 6. ICT Influences Economic Growth and Development

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Agree | 15 | 27.8 | 27.8 | 27.8 |
|  | Agree | 14 | 25.9 | 25.9 | 53.7 |
|  | Undecided | 9 | 16.7 | 16.7 | 70.4 |
|  | Disagree | 8 | 14.8 | 14.8 | 85.2 |
|  | Strongly Disagree | 8 | 14.8 | 14.8 | 100.0 |
|  | Total | 54 | 100.0 |  |  |

Table 7 highlights respondents' perceptions of ICT's contribution to Nigeria's economic growth and development. Out of (54) participants, (15) respondents, representing (27.8%), strongly agreed, while (18) respondents, accounting for the largest share at (33.3%), agreed. Meanwhile, (5) respondents, constituting (9.3%), were undecided. Conversely, (10) respondents, representing (18.5%), disagreed, and (6) respondents, equivalent to (11.1%), strongly disagreed. The cumulative distribution indicates that a majority of (61.1%) supported the view that ICT has contributed to economic growth and development, while (29.6%) opposed it, and a smaller fraction (9.3%) remained neutral. This suggests a generally positive assessment of ICT's economic impact.

Table 7. ICT has Contributed to Nigerian Economy Growth and Development

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Agree | 15 | 27.8 | 27.8 | 27.8 |
|  | Agree | 18 | 33.3 | 33.3 | 61.1 |
|  | Undecided | 5 | 9.3 | 9.3 | 70.4 |
|  | Disagree | 10 | 18.5 | 18.5 | 88.9 |
|  | Strongly Disagree | 6 | 11.1 | 11.1 | 100.0 |
|  | Total | 54 | 100.0 | 100.0 |  |

Table 8 presents respondents' views on the level of ICT awareness in Nigeria. Out of (54) participants, (12) respondents, representing (22.2%), strongly agreed that ICT awareness is high, while (18) respondents, making up (33.3%), agreed. In contrast, (10) respondents, constituting (18.5%), were undecided. However, (14) respondents, accounting for (25.9%), disagreed, with no respondents strongly disagreeing. The cumulative distribution reveals that a majority of (55.6%) perceived ICT awareness in Nigeria as high, while (25.9%) disagreed, and (18.5%) remained neutral. This suggests that although awareness is generally seen as high, a significant portion of respondents expressed doubt about its overall level.

Table 8. The Level of ICT Awareness in Nigeria is High

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly Agree | 12 | 22.2 | 22.2 | 22.2 |
| | Agree | 18 | 33.3 | 33.3 | 55.6 |
| | Undecided | 10 | 18.5 | 18.5 | 74.1 |
| | Disagree | 14 | 25.9 | 25.9 | 100.0 |
| | Total | 54 | 100.0 | 100.0 | |

Table 9 presents respondents' opinions on whether ICT is useful in all aspects of Nigeria's economy. Out of (54) participants, (8) respondents, representing (14.8%), strongly agreed, while (7) respondents, making up (13.0%), agreed. Meanwhile, (8) respondents, constituting (14.8%), were undecided. On the contrary, (15) respondents, accounting for (27.8%), disagreed, and (16) respondents, the largest share at (29.6%), strongly disagreed. The cumulative distribution shows that only (27.8%) of respondents supported ICT's usefulness across all economic sectors, while a majority of (57.4%) opposed it, with (14.8%) neutral. This indicates skepticism among respondents about ICT's universal applicability within Nigeria's economy.

Table 9. ICT is Useful in All Aspect of Nigeria's Economy

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | strongly agree | 8 | 14.8 | 14.8 | 14.8 |
| | agree | 7 | 13.0 | 13.0 | 27.8 |
| | undecided | 8 | 14.8 | 14.8 | 42.6 |
| | disagree | 15 | 27.8 | 27.8 | 70.4 |
| | strongly disagree | 16 | 29.6 | 29.6 | 100.0 |
| | Total | 54 | 100.0 | 100.0 | |

### Hypothesis to be Tested

The null hypothesis (H0) states that Information and Communication Technology (ICT) has not contributed to Nigeria's economic growth and development, while the alternative hypothesis (H1) suggests that ICT has contributed to Nigeria's economic growth and development. The significance level used for this test is 0.05. The decision rule is to reject the null hypothesis if the p-value is less than the significance level, and to accept the null hypothesis if otherwise.

Table 11 presents the Chi-Square test result on whether ICT has contributed to Nigeria's economic growth and development. The Chi-Square value is (11.741) with (4) degrees of freedom and an asymptotic significance level (p-value) of (.019). Since the p-value (.019) is less than the level of significance (0.05), the decision rule implies rejection of the null hypothesis ($H_0$) and acceptance of the alternative hypothesis ($H_1$). This indicates that ICT has indeed contributed significantly to Nigeria's economic growth and development. Therefore, the study provides statistical evidence supporting ICT as a vital driver of economic progress in the country.

Table 11. Test Statistics

| | ICT has contributed to Nigerian economic growth and development |
|---|---|
| Chi-Square | 11.741a |
| df | 4 |
| Asymp. Sig. | .019 |

The demographic distribution of respondents provides insight into the representativeness and credibility of the study. Table 1 shows that females slightly outnumbered males, suggesting balanced gender participation. In a related study, balanced gender involvement was highlighted as critical for ensuring inclusiveness in ICT adoption research (Osabohien, 2024). In contrast, some studies reported male dominance in ICT-related surveys, reflecting persistent gender disparities in digital engagement (Elsayed et al, 2024). Table 2 reveals that the majority of respondents were between 31 and 50 years, an age group considered economically active and technologically adaptive. This finding agreed with Oyadeyi (2024), who noted that middle-aged adults are often more receptive to ICT's economic applications. In contrast, other studies have shown that younger demographics frequently lead in ICT awareness, although with less emphasis on economic integration (Exton & Shinwell, 2018). This variation in demographic characteristics across studies highlights the importance of context when analyzing ICT adoption trends.

Table 3 highlights a high level of educational attainment, with most respondents holding tertiary qualifications. This supports the assertion that education significantly enhances ICT adoption and utilization (Bontadini et al, 2024). In contrast, studies in rural Nigerian communities have shown low ICT awareness linked to limited educational access (Manafa et al, 2022). Table 4 shows that singles and married individuals were equally represented, while divorced and widowed respondents formed the minority. This reflects a balanced marital distribution. Similarly, Zambianchi et al, (2019) reported that marital status had minimal influence on ICT perceptions compared to education and gender.

Respondents' perceptions of ICT's economic importance are also revealing. Tables 5 to 7 show that the majority agreed that ICT is important to Nigeria's economy and contributes to its growth and development. This finding aligns with Bisht and Mishra (2016), who linked ICT to improved financial inclusion and service delivery. In contrast, a significant minority expressed uncertainty or opposition, reflecting skepticism that has also been documented in contexts of infrastructural and policy gaps (Carrillo et al, 2023). Despite this, the overall consensus still underscores ICT's potential impact on economic development.

However, Table 9 indicates that only a small portion of respondents believed ICT is useful across all economic sectors, while a larger proportion disagreed. This finding agreed with Owolabi et al, (2023), who argued that ICT benefits remain unevenly distributed across Nigeria's economy. The hypothesis test in Table 11 provides further clarity. With the p-value lower than the significance level, the null hypothesis was rejected, confirming that ICT has contributed significantly to Nigeria's economic growth. This result supports broader studies emphasizing ICT as a catalyst for national development.

## Conclusions

The study has demonstrated that ICT plays a pivotal role in Nigeria's economic growth and development. The demographic profile of respondents, comprising a balanced distribution of gender, age, education, and marital status, enhanced the reliability of the findings. Most respondents acknowledged ICT as vital to the nation's economy, recognizing its influence in driving growth, although concerns were expressed about its universal applicability and the adequacy of awareness across all sectors. The hypothesis testing further confirmed these perceptions, as the Chi-Square analysis provided statistical evidence to reject the null hypothesis,

affirming that ICT has significantly contributed to Nigeria's economic development. This underscores ICT as a transformative tool for national progress, while also highlighting the need to strengthen awareness, accessibility, and sector-wide integration for sustained impact.

## Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

## Conflicts of Interest

All authors in this publication declare no conflict of interest regarding the title, data, location, and results of the research.

## Supplementary Materials

This study does not include any supplementary materials.

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