ENUGU STATE UNIVERSITY OF SCIENCE & TECHNOLOGY

JOURNAL OF SOCIAL SCIENCES & HUMANITIES

Volume 10
Number 1, 2025

PUBLISHED BY
Faculty of Social Sciences,
Enugu State University of Science And Technology

Effect of Basic ICT Infrastructure Development on the E-Readiness Ranking of Southeast, Nigeria

Ugada, Martin Onwudinjo
Department of Public Administration,
Caritas University, Amorji-Nike, Enugu, Nigeria

Abstract

The study focused on determining the influence of basic ICT infrastructure development on the e-readiness ranking of South East, Nigeria. To carry out this research, a population of 2004 covering two states in South East, Nigeria was chosen. A sample size of 1908 was determined by use of Taro Yamane statistical formula. The descriptive survey research design was employed. Data was generated by use of both primary and secondary sources. These data were analyzed by means of simple percentages, and mean scores, while test of hypothesis was done using the z-test. Frequencies were applied in data presentation. The study found that provision of basic infrastructural facilities such as functional websites, effective database, laptops / computers for public officials, intra-departmental and inter-ministerial ICT interconnectivity within the MDAs., and 24 –hour online daily services to the citizens, stakeholders and public officials, will ensure a fully networked presence. This is the recommendation of the study, so that the governments of South East, Nigeria can achieve the status of comparative competiveness in the world order of e-readiness

Keywords: ***Competitiveness, e-readiness, infrastructure, interconnectivity, MDA***

Background of the Study

The experience of a high level of efficiency, transparency and accountability in the private' sector by adoption of ICTs raised the hopes and expectations of the public sector in Nigeria that adopting and implementing e-governance was the best way to improve public service delivery. (Christina et al, 2019). It was perceived that the frameworks and systems for administration in Nigeria was inadequate to handle the demands of an increasing population facing the challenges of complex global economie (Adeyemo, 2018).

Over the years, performance of the Nigerian public sector has been described as unsatisfactory, incapable of meeting the demands and expectations of the citizenry, and therefore, unacceptable. It has rendered poor quality services considered inefficient and ineffective, suffered from poor database management, imprudent management of available scarce resources, corruption in high places, inefficiency in internally generated revenue, and manual governance practices (Eze, 2019).

Technological advancements have played significant roles in the globalization of commerce, communication, economics, politics, customs, traditions and life styles. More especially, modern communication technology or information and communication technologies (ICTs) is not only a means of improving effectiveness and efficiency in service delivery in the business world, but an avenue for improving the standard of living of people all over the world (Adeyemo, 2018). E-governance "is the application of information and communication technologies (ICTs) by government to move away from the traditional bureaucratic, slow, anti-democratic process in order to achieve optimal performance with speed, accuracy, transparency, accountability and efficiency, thereby satisfying citizens' in the democratic

government. This view is supported by Uba and Ukomadu (2018) who assert that the advent of e-governance in the 21st century has introduced paradigm shift in modern public administration and governance. This is intended to wipe out all forms of bottlenecks or delays in administration. Adeyemo (2018) observes that most Ministries, Departments and Agencies (MDAs) embraced the use of computer to facilitate their businesses. This was the introduction of e-governance. Between 2008 and 2010, many MDAs in South East, Nigeria joined the computer world in their businesses.

While the adoption of e-government has hit highly remarkable heights in the developed nations, its application in the developing countries including Nigeria is still under serious scrutiny. Today, Nigeria is said to be experimenting in e-governance operationally when compared to the developed countries. (Bhamangar, 2017). For instance, the United Nations E-governance Report (2018) ranked Nigeria 141 out of 193 in terms of statistics. Practically, the notion is that government institutions in "Nigeria are yet to exceed the billboard or partial service delivery, (such as an ordinary service government website), to claim e-governance adoption". Furthermore, the Nigerian experience is that the e-governance project is fashioned after the interest of government, the service provides, those that fund it and the donors, without minding the values, needs, choice and expectations of the people who are the beneficiaries of the project.

Statement of Research Problem

Most of the recent budgets of South East State governments have consistently made adequate provision for ICT infrastructure that would make for ease of government business as well as online access to citizens (Aneke, 2018). These budgetary provisions over the years, should enable the South East State governments to adequately provide the basic ICTs infrastructure for public officials and citizens alike.

Nigeria has always proved a paradox to the international community particularly when its level of development is compared with its economic potentials (Adeyemo, 2018). The unfortunate thing about the e-government imitative in Nigeria is that it focused on the interests of the government and the funding groups and donors, without regard to the interests of the citizens who are the principal beneficiaries (Ojo, 2019). The satisfaction of citizens' expectations of a flexible, result-oriented public service driven by electronic governance was not taken into consideration.

Objective of the Study

The objective of the study was to determine what basic ICT infrastructure needs to be provided to influence e-readiness ranking of South East, Nigeria.

Research Question

What basic ICT infrastructure need to be provided to influence the e-readiness ranking of South East, Nigeria?

Research Hypothesis

No basic ICT infrastructure are needed to influence e-readiness ranking of South East, Nigeria.

Conceptual Review of Related Literature

E-governance (Electronic Governance)

The United Nations e-government Report (2018) states that "e-governance is of recent origin having emerged at the beginning of the 21st century". In the early period of its inception and growth, e-governance focused on e-commerce in government business without mutual

reciprocal responses. Maro et al (2019) assert that the acceptance of e-governance made scholars to focus attention on discrete evaluation of the extent to which such services could enhance conduct of government business.

E-governance has a broad view of the use of information and technology in government enterprises in order to engender wider government and citizen integrated and participatory approach to relationship in business and service delivery.

Various scholars have given different definitions of e-governance. Sunday (2019) opines that e-government has to with the use by various public sector agencies of information and communication technology to improve services through transparency and accountability in the transaction of government businesses. According to him, e-governance is political strategy for making government activities public by means of modern communication.

In his opinion, Bachus (2017) further sees electronic governance as a broad concept that analyses and evaluates how technologies impact on governmental administration and the public in the wider society. E-governance has the aim of improvising government operations, the delivery of public services, and guaranteeing citizen participation in decision making.

Danfualni (2018) informs that e-governance revolves around "e-government, e-participation, e-registration, e-taxation, e-mobilization, e-education, e-service delivery, e-feedback, e-policing, e-debate, and the analysis of public financial statements". This means that the entire government activities have to be carried out by means of electronic processes of communication that would guarantee speed and efficiency as government works cooperatively with non-profit organizations' and private institutions to achieve a common objective.

Adeymo in Attah (2020) observes that the main purpose of applying e-governance in government businesses is to foster good governance characterized by equality and equity, citizens' participation in decision making, transparency and accountability on the part of public officials in various spheres of the economy. As observed by Danfulani (2018), e-governance is a transition on the basis of a revolution in information and communication technology by means of digital technologies as experienced in the use of internet, personal computer, mobile phones and numerous other electronic appliances / application. These devices smoothly and efficiently facilitated transmission of information and services between government and society.

Willic (2017) asserts that information and communication technology is a tool for transformation of the society electronically. Electronic government has been globally accepted as a reliable means of improving government business transactions with citizens through administrative processes that ensure efficient public service delivery (Radiankrismann, 2018). In the view of Branen (2017), e-governance seeks to enable the citizens enjoy a stress-free access to public services, thereby avoiding the cumbersome bureaucratic processes. In the same vein, Banister and Welsh (2017), opine that e-governance involves the deployment of information and communication technology in promoting frequent participation of citizens in the governance of the society through administrative processes of government agencies and political institutions. Palvia and Sharma (2017) corroborate this view by agreeing that e-governance is concerned with the internal use of information and internet technologies to manage resources like capital, men, materials and machines that aid administrative processes. Sheridan and Riley (2018) assert that electronic governance entails a whole gainut of networks and inter-relationships between government and the rest of the society in respect of the application of information and communication technology. In other words, e-governance is all about the electronic communication processes that facilitate the administrative relations between public institutions and the society.

Bachus (2017) identified three main groups in e-governance, namely, "government, citizens and business / internet groups". These are the three major relationship models in e-governance.

(i) Government to Government (G2G).
(ii) Government to Citizen (G2C).
(iii) Government to Business (G2B).

Nigeria's E-government Ranking

The UN Global e-government Survey Report (2004, 2008, 2018) presented a comparative analysis of the e-readiness of five West Africa Nations, including Nigeria. Out of a total of 192 member states examined, Table 1 shows the global ranking and index of the first five West African Nations. Tables 2, 3 and 4 show the e-readiness, e-participation and service delivery indices as they affect Nigeria.

Although Nigeria's e-ranking had improved from 141st position out of 192 countries in 2004, to 136th position in 2008, this is nothing to write home about when compared with Cape Verde which is still placed at 104th position in the global ranking and 1st position in the West African sub-region, in 2008. With a score of 0.210 in 2008 as compared with the world average of 0.4514, the West African sub-region was rated the lowest in the ranking. The ranking showed Cape Verde with 0.4156 leading the region, followed by Nigeria with 0.363, and Ghana with 0.2997. These are the three spots in the West African sub-region.

What needs to be done to improve on Nigeria's satiation?

Table 1. West African countries e-government readiness index 2004/2005/2008.

		Index 2004	Index 2005	Index 2008	Global ranking in		
					2004	2005	2008
1	Cape Verde	0.3442	0.3346	0.4158	107	116	104
2	Nigeria	0.2485	0.2758	0.3063	141	139	136
3	Ghana	0.2369	0.2758	0.2997	143	133	138
4	Senegal	0.2328	0.2238	0.2531	145	153	153
5	Gambia	0.171	0.1736	0.2253	162	163	159

Table 2. Nigeria e-readiness/e-participation index 2004/2005/2008.

Year	Web measure index	Infrastructure index	Human capital index	E-gov. readiness index	E-gov. readiness rank	E-participation index	E-participation rank
2008	0.2241	0.0492	0.648	0.3063	136	0.0682	116
2005	0.2231	0.0143	0.59	0.2758	139	0.0794	39
2004	0.143	0.013	0.59	0.248	141	0.0656	33

Table 3. Nigeria infrastructure index.

Year	Internet users index	PC index	Tel Lines index	Online pop index	Mobile subscription index	TV sets index	Broadband index	Infra structure index
2008	0.067	0.01	0.013	Not Used	0.156	Not used	0	0.0492
2005	0.009	0.009	0.0066	0.001	0.0214	0.072	Not Used	0.0143
2004	0	0	0	0	0	0.1	Not Used	0.013

Table 4. Nigeria (Service delivery by stages (percent utilization)).

Year	Stage 1 emerging	Stage 2 enhanced	Stage 3 interactive	Stage 4 transactional	Stage 5 connected	Total (%)
2008	8	32	27	0	0	67
2005	100	24	26	5	9	21.17
2004	87.5	12.6	20.2	0	3.7	13.5

terms with the new realities. These aspects are discussed hereunder:-

(a) Technology: This includes the "ICT infrastructure, the hardware and software solutions".
(b) Administration: This concerns the "administrative and bureaucratic environment, and human resource policy".
(c) Operation: This involves the "Legal environment of administrative and operational aspects". (Ebrahim and Irani, 2015).

Interoperability

"Interoperability is the ability of different e-government / IT systems from various MDAs to interact by communicating, interpreting and exchanging information in a meaningful way to deliver public services that require, two or more MDAs in an integrated number" (NITDA, 2019).

If interoperability must be achieved, for effective delivery of integrated services between MDAs, the following requirements need to be accomplished:

(a) The appropriate processes must be identified and agreed upon.
(b) Data should be presented in a standard and reasonable manner through IT infrastructure / applications.
(c) Having the ability of cooperating IT infrastructure/applications in a meaningful way for service delivery to users through exchanged data.

Therefore, for joint delivery of government services, the MDAs must work together by use of ICT when the above concepts are in place. Thus, the MDAs should agree on IT specification, standardized technology and process integration needed for e-government/IT systems interoperability (National Information Technology Development Agency, 2019). Because interoperability of e-government/IT (e-GIT) involves many agencies acting together, it behoves on these MDAs to design principles which will be shared amongst them for operationalization of Ne-GIT. Hereunder, are the underlying principles of Ne-GIT:-

(A) Underlying Principles of Ne-GIT

There are three underlying principles of Ne-GIT).

(a) Standardization of Information Technology. (NITDA, 2019).
(b) Integration Process.
(c) Delivery of Public Services Efficiently.

Information Technology Standardization:

This makes it easy for IT acquisition efficiency within and among all the MDAs and enables government develop capacities for sharing resources and modern technologies. Costs would be reduced when the technology standardization is achieved across board.

Process Integration:

To achieve an effective process integration, data standardization must have been put in place. This enables a seamless and easy service delivery through a shared communication exchange mechanism, thereby allowing the various MDAs and businesses easy access to each other and having a common transparent view of public information. (NITDA, 2019)..

Efficient Service Delivery:

The most important goal of Ne-GIT is to ensure efficient delivery of services by government agencies. The required transformation in digital capacity of government is to use electronic means in efficient delivery to citizens at affordable cost (NITDA, 2019).

(B) Major Technical Requirements for Achieving Interoperability:

To achieve interoperability between (MDAs, two things have to be identified at different levels of interoperability.

(a) “Adoption of Open Standards; and
(b) Metadata Standards Definition”.

Open Standard:

The major focus of interoperability is the adoption of open standards for all government systems. These open standards include the internet and the World Wide Web. (NITDA, 2019).

Open standards as a concept has no generally agreed upon definition, but there are some necessary clarifications of the term, namely;

(a) A transformative transparent management process accessible to all stakeholders.
(b) This process is approved by consensus of the participants.
(c) The process should be "platform independent, vendor neutral, and useable by unrestricted number of competing "implementators"
(d) Specifications and documentation should be published.
(e) Should be accessible to everyone without bias.

It is recommended that MDAs should highly adopt open standards with particular attention paid to web and internet technologies for e-exercise. (NITDA, 2019).

Metadata and Metadata Standards:

Metadata requires that we understand what data means and ensure its accurate interpretation by both owners and consumers. A number of attributes or characteristics known as metadata help us have common understanding. This standard is aimed at reinforcing interoperability across all the MDAs "for online data discovery, use and management (NITDA, 2019).

(C) General Requirement for e-Government / IT Interoperability:

In order to achieve positive impact through interoperability, both technological and human factors come under consideration. These factors combine to enable integrated service delivery between and among the various MDAs. This involves "identifying and agreeing on required processes (human), seamless exchange of data through IT infrastructure (technology) and ability of cooperating IT infrastructure to understand meaning of exchanged data the same way (technology) at both ends". (NITDA, 2019).

Three critical areas that lead to public service digitization for efficient service delivery via interoperability are identified as follows:-

(i) Definition of processes for MDAs delivery of integrated services;
(ii) Sharing of data among various e-government /IT systems in ways that are standardized and fully understood.
(iii) Being able to cooperate e-Government/ IT systems for understandable communication that makes for efficient public service delivery. (NITDA, 2019).

The above are further categorized and discussed under the following three levels:-

(a) Organizational Interoperability:

This refers to the capacity of the MDAs for defining, implementing and managing organizational processes and barriers for cross-portfolio delivery of services.

(b) Semantic Interoperability:

This looks at the presentation of data in a "standardized, shared and meaningful way to cooperating e-Government/ IT systems and infrastructure while exchanging data".

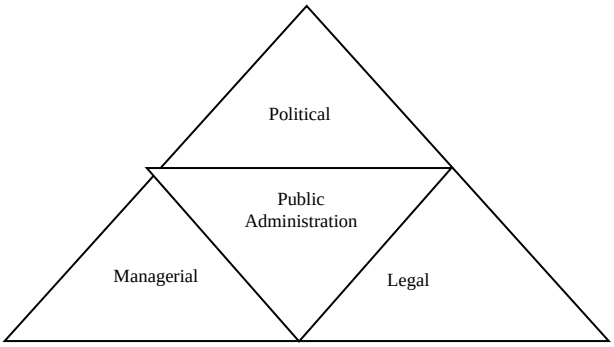
(c) Technical Interoperability:

This is the "ability of cooperating e-Government/IT infrastructure/applications to communicate seamlessly and use the exchanged data understandably for public service provision and delivery". (NITDA, 2019).

From the foregoing, it is obvious that both human and technological factors are pre-requisites for effective e-Government interoperability. In respect of the technological factors, the various technologies should adopt the open standards and metadata dimension (NITD, 2019).

(D) E-Government Interoperability Framework:

The human and technological factors of interoperability are *"sine qua non"* for developing a functional e-Governance Interoperability Framework geared towards achieving coordinated and fully integrated delivery of services between MDAs. Various studies have shown that three competing approaches exist in Public Administration (Rosenbloom cited in NITDA, 2019). These competing approaches include Political, Management, and Legal approaches. As indicated in the diagram below, Public Administration lies at the centre of the three approaches.



A balance between these approaches is very necessary for the achievement of e-Government projects. This means that political interests and structure must synchronize with the constitution and extant laws and regulations as well as the managerial skill styles introduced to generate efficiency in public service delivery by electronic means. The human and technology factors permeate the organizational, semantic and technical interoperability which when appropriately applied makes it feasible and sustainable (NITDA, 2019). But how far has Nigeria achieved interoperability in e-government? How far has Nigeria developed its ICT infrastructure?

Conceptual Framework

Independent Variable	**Dependent Variable**
ICT Infrastructure Development - Effective Data-base - Adequate ICT infrastructure	E-readiness Ranking of South East, Nigeria. - Full online interconnected stakeholders - Interoperability / Interconnectivity between MDAs - Efficiency in Service Delivery - Transparency and Accountability

Theoretical Framework

Modernisation Theory

The modern man needs change because he believes that a new thing or product or idea will be better and most likely to produce a more purposeful and improved result (Ojo, 2018). Modernization theory goes further to explain the transformation of traditional institutions to modern ones. This theory tries to compare the level of modernity between the countries of the world as they shift from the most traditional to the most modern ones (Rostow, 1956). Modernisation involves the social changes and modern administrative processes that are now taking place in the western world and have also started happening in developing countries including Nigeria. Such most recent trends include e-governance and the e-readiness issues.

Diffusion of Innovation Theory (Dol)

Diffusion of innovation is a social process that takes place when people respond in pursuit of internalizing a new idea or product. A classical understanding of diffusion entails an innovation communicated through particular channels over time between people who belong to a social system (Rogers in Onyinye, 2022). The ultimate result of diffusion is that members within a social system assimilate and adopt the new idea, behaviour or product (Jones and Jeffrey, 2018).

Diffusion of Innovation Theory was developed in 1962 by E.M. Rogers. This theory stands as one of the earliest theories in social sciences. It was set to clarify how a new idea or product within a space of time, gains acceptance by a given population. And, as Onyinye, (2022) observes, the applicability of the theory in most of the new technologies in social sciences and human progress, is one of its greatest strengths. The theory has been confirmed by various disciplines as a framework, and different studies have confirmed the theory's general applicability (Onyinye, 2022).

Empirical Review

Infrastructure Development (Ways of Improving e-governance in South East, Nigeria)

(i). Database/Data Management
(ii). Transformation from Billboard to Fully interconnected/Integrated online services. } Objective

Ogidan, et al (2017), gave an exposition of some ICT strategies that could make the country strengthen its status on e-governance and achieve the vision of coming between the bracket of the top 20 global economies by 2020. The topic of the study is "ICT for good governance and socio-economic development in Nigeria." They used the desktop research approach to evaluate some technical details of ICT equipment for achieving e-governance in Nigeria. Appropriate policy suggestion was made for efficient employment of ICT to generate good governance in Nigeria by installing good e-governance structures and ensuring full participation of all stakeholders.

Obi et al, (2020), examined "E-governance and Service Delivery in the Nigerian Civil Service" and observed that the coming into existence of information communication technology has made government programmes and activities more accessible to the public thereby breaking the barriers to distance. The application of electronic governance has made it easy 'to spread information, and enhancing citizens perception, sending feedback to the citents, monitoring and evaluating government projects and making government accountable and transparent in its total political engagements." The study was an attempt to determine the extent e-governance

implementation has enhanced administrative efficiency in the Nigerian civil service, and to find out whether e-governance has been useful in reducing corruption in the Nigeria Civil Service. The paper relied on modernization theory and applied the qualitative research method as data that formed the major bulk of the research were gathered from secondary sources. Findings revealed that e-governance makes service delivery exceptionally easier as is evidenced from the transformation from the old rigid traditional methods to the more flexible modern efficient and effective practices. The researchers' recommendation is for Nigeria's public service to show a high level of e-readiness in their operations while government provides adequate information and communication technologies infrastructure.

Olusegun (2017) under the platform of the Nigeria Communications Commission (NCC) examined the "Strategy for Addressing National E-governance Risks using Cyber Security Advocacy". He observed that enormous capacities of governance are under serious threats from risk factors noticed in present day ICTs system, he also was of the view that e-governance (e-G) exposure and assessments received insufficient attention to security aspects from the handlers of e-governance infrastructure system. Being an extreme important factor-, e-governance heavily depends on ICTs infrastructure framework in order to enhance operations for both internet and non-internet applications.

Ukanwah (2018) examined "Biometric technology usage in securing e-Governance in Nigeria: benefits and challenges" At the wake of the 21st century, governments all over the world have embraced e-government for effective public service delivery. Governments are becoming more responsive and responsible in embarking on interactive relationships with the citizens resulting in cutting of costs and efficient service delivery prone to transparency and accountability. For e-Governance to succeed, as an instrument to drive public service delivery, robust identity authentication through a thoroughly integrated biometric technology must be put in place. Currently, many government institutions in Nigeria have online services by means of websites, emails, payment portals, etc for service delivery, and interaction with stakeholders and all citizens. Biometric technology has also been employed by government for modernization of the civil service such as the IPPIS, GIFMIS, Cashless policy, etc aimed at flushing out ghost workers. Government has further embarked on the National Identification Number (NIN), Bank Verification Number (BVN), SIM card registration, Voters Registration, Digital ID card and many others all of which are in pursuit of identity registration via biometric technology aimed at reducing fraud in the civil service. But the question arises as to security, privacy and trust the citizens have in the use of biometrics. The paper traced the history of e-government, particularly in Nigeria and discussed the function of biometric technology in ensuring efficient and effective public service delivery. It was obvious that biometric technology is an integral part of information communication technology infrastructural base.

Onu, et al (2016) did a study on "Evaluation of E-government Implementation. The Case of State Governments' Websites in Nigeria" The paper investigated how far the e-government adoption and implementation conformed to the national IT strategic policy. The survey method was adopted by the study and was anchored on content analysis of the existing official websites of the entire 36 states of the federation plus the Federal Capital Territory (FCT). It was discovered that only twenty-three states representing 64% out of the thirty-six states had established websites for downloadable online interactive digital documents. In its recommendation, the paper called on the Nigerian government to establish implementation guidelines for e-government, whilst the National Information Technology Development Agency (NITDA) should be pushful and productive in monitoring IT policy implementation.

Paul Van Der Molon and Martin Wubbe (2017) investigated "E-government and E-land Administration in the Netherlands". They observed that there would be no e-government if there was no land information. According to them e-government, being the application of ICTs to improve public service, has a great impact on the operations of their organization. The study believed that in order to realize e-government, three factors come under consideration:

(i) Government should facilitate a spatial data infrastructure to enable citizens have access to, and utilize land information;

(ii) If people must make use of the facilities, government should provide electronic legal as well as economic activities and participation;

(iii) As data suppliers, who intend to give quality e-services, government must ensure availability of access to online services.

So, in respect of the first bullet point: "what is the government doing to create an infrastructural activity and put digital datasets in place?," the study monitored the following initiatives:

(a) Creating "authentic/key/base registers" to centralize registration and avoid double work.

(b) Concentrating land information; and

(c) Explanation of digital datasets;

(d) Sound registration and information exchange or underground topography.

The second bullet is about "what the government is putting in place to make the practical use of the infrastructure possible." The crucial points include:

(a) Introducing "Digital Identity Code"

(b) Introducing "Unique Individual Numbers"

(c) Creating a government-wide shared ICT service

The third bullet pint is "what are they as data supplier doing to respond to all these? The critical points include:

"(a) Electronic submission of deeds (lodging);

(b) Centralizing the datasets;

(c) Complete renewal of the site that makes it possible to distribute data

(d) Setting up a national system to safeguard efficient location and tracks of cables and pipelines;

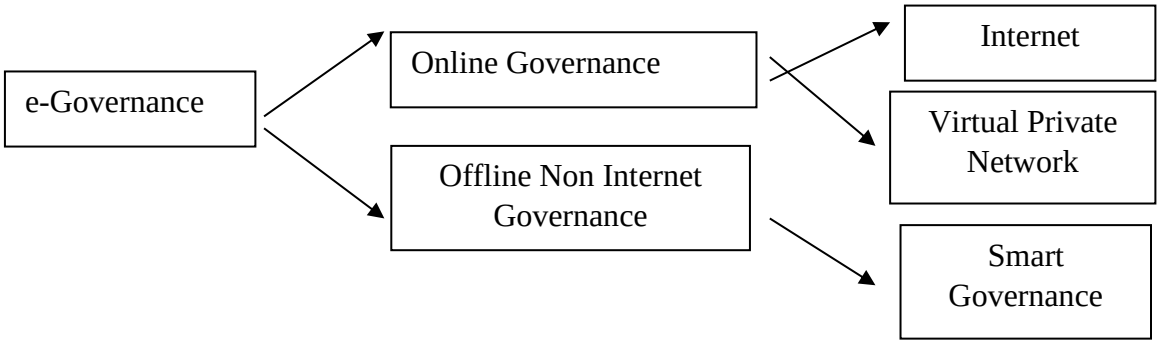
(e) Having the possibility of asking questions 24 hours a day."

Azeez, Absioye, et al, (2016) examined "The Various Challenges Facing e-Government Implementation in Embracing Adequate Database System in the Civil Service of Nigeria". The paper approached the investigation in two phases, namely the pre-IT implementation stage, and

the post-IT implementation phase. The study revealed that implementation of ICT in the civil service will remain a mirage until threats like provision of adequate database and appropriate ICTs infrastructure are addressed. It was, therefore, recommended that these threats should be tackled headlong and overcome to enable a successful implementation of e-government in Nigeria.

Adah (2015) studied the "Status and Nature of E-Governance in Nigeria". The paper applied the case study design. Data were collected from secondary sources including journal textbooks internet materials, etc. and analyzed quantitatively by means of content analysis. The study was centered on determining the level of readiness of e-governance in Nigeria, and noticed various measures adopted by Nigerias ICTs compliance such as mobile apps and portals as well as effective database system. Despite this notion, there are contradictory views of the international community in various surveys ranking Nigeria low in e-readiness. The paper also noted that disparities in level of preparedness for e-government in various countries are occasioned by "lack of online database system, telecommunication infrastructure and human capital development". The study, therefore, strongly recommended that governments should be abreast with current trends and innovations in ICTs at every level of education so as to develop a new generation of computer literate citizens.

Main categories of e-Governance



The study observed that the purpose of e-governance as intended by government is to transform the interaction and relationship between government and the beneficiaries of government services by means of electronic delivery systems, so as to strengthen and grow the economy in a more responsibly organized, coordinated, efficient and effective manner. It is sad to note that no African country, including Nigeria, has been graded among the top 50 nations to have met the "e-Governance Readiness Index of UN's 2010 objectives".

In respect of cyber security considerations, e-services are built and driven from the core principles of confidentiality, integrity, and availability (CIA). The study in consideration of the achievement of a trusted e-governance infrastructure adoption and implementation strategy, recommended the application of the following success factors:

(i) Focus on the central principles of cyber security's CIA;

(ii) Effective information security measures that will limit the e-governance risk exposure need to be integrated at the foundation level of design and development, and implemented harmoniously throughout the operational phase"

Ahman et al (2019) noted that Nigeria is a country that has always posed a paradox to the international community when it comes to the level of the development of its economic potentials. This problem has manifested in the low ranking of Nigeria by International surveys not minding assumed efforts at development of ICT infrastructure and human capital in Nigeria. It is believed that Nigeria has the fastest growing and most profitable and patronized and therefore the most lucrative market in African as regards telecommunications, information

and technology (ICT). In spite of all the assumed progress, Nigeria is still very low in e-governance provision ranking.

Adeyemo (2017) in a study titled "E-government Implementation in Nigeria: An Assessment of Nigeria's Global e-Government Ranking" reviewed the aim and methodology applied by ranking agencies, and did an evaluation of Nigeria's performance in the various global surveys in e-government. He employed the desk survey research design and picked out spots of shortcoming which influenced and caused the low level of service delivery in Nigeria. Despite the seeming commendable success presumed to have been recorded by Nigeria in its ICT and telecommunications sector, the study identified several factors which constitute serious barriers to e-government implementation in developing countries like Nigeria. These include, reluctance to share information; the government being faced with management challenges in the implementation of e-government; low information technology literacy which slows down the process of e-government; low penetration and distribution of high speed connectivity to the internet digital divide; insufficient allocation of financial resources due to a mismatch between the current and future systems resulting from the large gaps between psychical, social ,cultural, economic and other context between the software designers and the place in which the system is being implemented." The study eventually recommended that to avoid the low ranking in e-government implementation global surveys, the United Nations e-government model shown below should be adopted:

"Stage 1- Emerging presence
Stage 2- Enhanced presence
Stage 3- Interactive presence
Stage 4- Transactional presence
Staeg5- Networked (Fully integrated) presence."

Mustapha, Afyontuogbu, et al (2018) examined "An e-Government project approach with e-transformation perspective." They used content analysis through a project management approach to highlight the difference between adoptive projects and transformative projects. Their findings suggest that three invisible parts of the iceberg in an e-government project comprises "human resource management, business process re-engineering, and administrative and legislative needs". In the first place, to successfully launch and manage the project plan, it is essential to get ready detailed technical specifications and project managers. Secondly, we do not have "one-size-fits-all" solutions applicable to problems of e-government project management. Thirdly, e-government projects came to be seen as solely the processes of purchasing software and hardware. Finally, the paper calls attention by way of a recommendation, that the first step to succeed in e-government projects is to take time to determine whether to apply the adoptive or reformative approach, so as not to stop midway and start all over again.

The Federal Ministry of Education developed a "National Policy on Information and Communications Technology (ICT) in Education (2019). The Ministry applied a multi-sectional approach to facilitate the production of an acceptable document that could easily be implemented. The following stakeholders collaborated with the Federal Government to produce the said ICT in Education policy namely, education parastatals, other relevant Federal Ministries, Departments and Agencies(MDAs). State Ministries of Education, IT professional bodies, private sector, non-governmental organizations and international development partners. The policy is a guide on what all stakeholders expect tin the process of an ICT integrated programme in education. Its effective implementation should usher in fast transformed processes of "teaching, learning, research and administration". The policy

document exposed the current status of ICT in education with the following strategies, practice and activities:-

(i). The use of the policy to pursue the development and application of ICT in education in Nigeria;

(ii). The provision of the following appropriate and necessary facilities:

"(a). Nigerian research and educational network (NigREN) which has already interconnected 27 Universities with a hub at the National Universities Commission;

(b). Campus networks in schools especially at the tertiary level;

(c). Functional websites, email facilities, and portals for the ministry and schools;

(d). Computers and multi-media facilities;

(e). Internet connectivity through VSAT and fiber optics in all federal institutions;

(f). Alternative power supply such as solar panels, generators, inverters and safety of the education community"

(iii). Embarking on schemes that would necessitate the supply of computers to public officials in the education discipline at preferential rates.

(iv). Establishing ICT laboratories in Centres of Excellence at the tertiary levels of education and other schools.

The Nigerian e-government interoperability framework (NeGIF) under the aegis of the National Information Technology Development Agency, NITDA (2019) applied the WoG (whole-of-Government) approach. This involves the re-engineering of back offices, coordination, integration and consolidating all transactions and business processes throughout government Ministries, Departments and Agencies (MDAs) for effective delivery of services, at affordable cost and most efficient manner. The study observed that what is necessary for achieving a good result on interoperability comprises both technological and human factors. This is better understood in the process of delivery of integrated services to many or all the MDSAs. Therefore, identifying and accepting the required processes (human), undisturbed free flow of information through IT infrastructure (technology) and ability of cooperating IT Infrastructure to convey appropriate meaning of transmitted data (technology) at both ends, is the full essence for the development of e-service applications. NeGIF recommends adoption of open standards specifically by use of web and internet technologies.

Richard Heeks (2018) investigated why "Most e-Government-for-Development Projects Fail: How Can Risks be reduced?" He agreed that e-government has the capability to contribute valuably to development. But, in his opinion, for now a majority of e-government-for-development projects have either totally or partially failed. The study explained the reasons for the experienced failure of such projects. These include:-

(i). The oversize gaps between project design and on the ground reality (known as "design –reality-gaps").

According to Heeks (2018) e-government promises greeter efficiency and effectiveness in the operations in the e-government-for-development projects in public sector. But behind these promises lies a bogus reality that such big grammar turns out as lies or failure. To explore his assertion, Heeks split e-government initiatives into three groups:

(a). Total failure

(b). Partial failures

(c).Success

Failure comes at a high price for world power countries in five categories of potential cost of e-government failure as identified below:

(a). Direct financial costs

(b). Opportunity cost
(c). Political Costs
(d). Failure costs

Analysis of e-government projects failures identify seven dimensions, summarized by the ITPOSMO acronym necessary for understanding of design-reality gaps. These include- information: technology; process; objectives and values; staffing and skills; management; other resources (Time and money). The study emphasized that in order to address e-government project failure, it is very necessary to reduce both the risks and at the gap existing between design and reality. The paper then provided a step-by-step guide for identifying and addressing failure risk for e-government risks:-

Step 1. Assess design reality gaps using the seven ITPOSMO dimensions:

Step 2: Determine action

Taking action means either-

(a). changing the design of the e-government project to make it more like reality; and/or

(b). Changing current reality to make it more like the assumptions/requirements within project design.

Step 3 (a) Generic Gap Reduction

Techniques to reduce the risk of e-Government failure. These include:

"(i). Legitimizing and mapping current reality;
(ii). Customization to match reality;
(iii). Client-vendor relationship management
(iv) Step-by-step modularity and instrumentalism;
(v) "Hybrids" and "thribrids"
(vi) Scope initiation "KISS and automation "KISS" (Keep it small and simple)
(vii) Reality-supporting and not rationality- imposing applications

Step 3 (b) Generic Gap Reduction

Techniques to reduce the risk of e-Government failure. These include:

"(i) Information dimension;
(ii) Technology dimension
(iii) Process dimension
(iv) Objectives and values dimension
(v) Staffing and skills dimension
(vi) Management system structures dimension
(vii) Management structures dimension
(viii) Other resources dimension"

Paul, David and Edward (2018) on the "Failure of the ISBN Bandwagon for the Organization for Economic Cooperation and Development OECD Tokyo/Osaka Workshop on information technology and New Growth Opportunities" referred to the "Uneven Under - graded Development" and opined that it was usually experienced in technological changes in respect of timing and location. Technological change is often comparable with "Surnamis" or unimaginable explosions. This situation is more exposed in the developing countries. ICTs have great role to play for sustainable development. New capabilities lead to progress in technical and scientific innovation. The risk for policy makers, representative of the civil society and the business community is to create a knowledge-based environment that maximizes the gains of ICTs as an innovation and minimizes the risks.

Such risks include the new "global apartheid" since the system is designed with gaps and are therefore inconsistent with development goals of third world/developing countries. This surely hampers infrastructural development for e-readiness of developing countries including Nigeria.

Methodology

The descriptive survey research design was applied in the study because it is contemporary, economical and does not alter the variable. The area covered by the study includes two states (Enugu and Abia) in South East, Nigeria using Office of Head of Service, Ministry of Works / Science and Technology, and Board of Internal Revenue. The population used in the research comprises the 2004 members of staff of the three MDAs mentioned above. Using the Taro Yamane statistical formula, a sample size of 1908 was determined as shown hereunder:-

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

Where n = Sample Size (1908)

N = Population (2004)

e = Acceptable margin of error (2.5%)

I = Constant

Questionnaire in a five-point Likert scale was used to elicit data from respondents. The instrument's validity and reliability were established respectively by pilot test and test-retest methods Presentation and Analysis of data was by means of frequencies, percentages and mean scores, while the test of hypothesis was by the z-test with the aid of SPSS statistical tool.

Data Presentation and Analysis

Research Question:

What basic ICT infrastructure need to be provided to influence the e-readiness ranking of South East, Nigeria?

Table 1

S/no	Statement of Service Delivery Content	Response					Total	Means	Std Deviation	Decision
		SA	A	UN	D	SD				
1	E-readiness ranking of South East, Nigeria will be significantly improved by provision of functional websites and portals for citizens and public officials by South East, Nigeria	814	877	126	0	63	1880	4.27	86	Accepted
2	E-readiness ranking of South East, Nigeria will be significantly improved by establishment of effective database for management, storage and retrieval of records in respect of staff matters, projects and other related service matters	848	877	92	34	29	1880	4.32	78	Accepted

3	Provision of computers for public officials will significantly enhance productivity for speed, accuracy, efficiency and effectiveness	1472	344	64	0	0	1880	4.75	51	Accepted
4	Intra-departmental and inter-minosterial connectivity will greatly reduce delays and significantly improve service delivery by MDAs to the public	877	911	63	29	0	1880	4.40	63	Accepted
5	Availability of 24 hours daily online government services to the citizens, stakeholders, and public officials will ensure a fully integrated, networked presence	751	877	218	34	0	1880	4.25	73	Accepted
6	Political will to fight corruption will improve service delivery in South East, Nigeria	751	659	218	155	34	1880	4.03	1.02	Accepted
	Grand Mean							**4.33**	**0.76**	

Source: Field Survey, 2022

The mean scores as shown in Table 4.2.4 above indicate that item No.3 obtained the highest mean of 4.75 followed by item 4 with a mean of 4.40; item no .2 with a mean of 4.32; item no.1 with a mean of 4.27; item No.5 with a mean of 4.25, and item No.6 with a mean of 4.03. However, with a grand mean of 4.33, the result shows that provision of basic infrastructural facilities will significantly improve e-readiness ranking of public service of South East, Nigeria.

Discussion of Results

After the test of hypothesis related to this research question, it was agreed that many things need to be done to improve on e-readiness ranking of South East, Nigeria.

The result of data analysis of the research question showed the mean scores for the six indices respectively as follows. 4.27, 4.32, 4.75, 4.40, 4.25, 4.03, with at grand mean of 4.33. The standard deviation were respectively 0.86, 0.78, 0.51, 0.63, 0.73, 1.02 and grand standard deviation of 0.76. All the statements in this research question were accepted by the respondents.

Despite all glowing success achieved by the governments of Enugu and Abia States in E-government adoption and implementation, there were areas which appeared to the researcher that needed attention to pull governments of South East, Nigeria through the five-stage e-readiness structure of competitive comparability. These areas bordered on construction and interoperability, which are expressed as interactivity in the dependent variables.

Summary of Findings

With z-cal 49.35 > z 1.46, it was found that the provision of basic infrastructural facilities will significantly improve the e-readiness making of public service in South East, Nigeria.

Conclusion

The researcher is satisfied that although much has been done in South East, and indeed Nigeria as a whole, in respect of e-governance adoption and implementation, a lot more needs to be done to overtake the billboard and join the world in a comparable competitive level of e-readiness.

Recommendation

Government of South East, Nigeria should embark on the provision of the following identified infrastructural facilities which will significantly improve their e-readiness ranking.

(i) Functional websites and portals for citizens and public officials.
(ii) Effective database for integrated storage and retrieval of records.
(iii) Laptops/computers for public officials.
(iv) Intra-departmental and inter-ministerial ICT connectivity within the MDAs.
(v) 24 – hour online daily services to the citizens, stakeholders and public officials, to ensure a fully networked presence.

References

Adah B.A. (2018) The status and nature of e-governance in Nigeria. *Department of Political Science and Public Administration.* Uyo, Akwa iBom State, Nigeria.

Adeyemo, A.B. (2018). E-government implementation in Nigeria: An assessment of Nigeria's global e-governance ranking*. Journal of internet and information system.* 2(1). Academic Journals.

Adiele, G.N. (2017). Improving productivity in the public sector through e-governance programmes. Covenant University *conference on e-governance in Nigeria*. CUCEN 2017.

Abdakareem, A.K. (2018). Challenges of e-government implementation in the Nigerian public service. *Journal of creative writing.* 1(104).

Attah, A.A (2020). An assessment of e-government implementation in Nigeria. *Journal of internet and information system*. 2(1).

Aminu, H.J. (2018). An e-readiness survey of selected federal ministries in Nigeria for freedom of information (FOI) and e-government implementation. *Researching journal of mass communication and information technology,* 4(1).

Aneke, F. (2019). Tackling telecommunications in Nigeria. *Dynamic export,* retrieved from www.dynamicexport.com.

Bhamangar (2017). E-government in the public sector, policy implementation and recommendations for policy makers. *Journal of the faculty of administrative sciences and policy studies.* Mara University of Technology. 7(3).

Bakry, S. H. (2018). Development of e-government: A scope view. *International journal of network management,* 14(5).

Brasel, J. (2019). Explaining cross-national variation in government adoption of new technologies. *International studies quarterly,* 55(1).

Chukwuemeka, E.O., Ubochi, E.I, and Okechukwu, E.U (2017). Effect of e-government on service delivery in Federal University, Ndufu-alike Ikwo, Ebonyi State. *Review of public administration and management: An open access journal,* 5(1).

Corpers, P. (2019). The road ahead of public service delivery. Delivery on the customer promise. *https//www.pwc.com/gx/pdf/theroad-ahead-for-public-service-delivery.pdf.*

Chondrie, J., Umeoji, E., & Forson, C. (2002). Diffusion of e-government in Nigeria: A qualitative study of culture and gender. *University of Hertfordshire. Business school of working paper.*

Cibbora, C. (2018). *From control to drift: The dynamics of corporate information infrastructure.* Oxford University Press.

Chikodi, O.C. & Inyiama, H.C. (2018). *A model of e-governance system for Nigeria.* Nnamdi Azikiwe University, Nigeria.

Dibie, R.A, & Quoadri, M.A (2018). Analysis of effectiveness of e-government in the federal government of Nigeria. *Journal of public administration and governance* . 8(3).

Davies, S.S. (2018). The evolution and continuing challenges of e-governance. *Public administration review, December, 2008, special issue.* Center for technology in government university of Albany.

Danfulani, D. (2018). The failure of e-government in developing countries. *The electronic journal of information systems in developing countries.* 26(7).

Eze, C.P, Chang, K., & Berry, F.S. (2017). Testing the development and diffusion of e-government and e-democracy: A global perspective. *Public Administration Review,* 7(3).

eNaira (n.d). Get started. Retrieved at: *https://enaira.com/wallet/get-started*.

Federal Ministry of Education (May, 2019). *National policy on information and communication technologies (ICT) in education.* Federal Government Printing press.

Fang, Z. (2019). E-government in digital era: concept, practice and development. *International journal of the computer, the internet and management review,* 5(4).

Heeks, R. (2018). *Most government-for-Development projects fail: How can risks be reduced?* Government Working Paper Series published by Institute for Development Policy and Management UK.

Joseph, R.C. & Jeffers, P.J. (2019). Curbing corruption in the public service: E-transformation approach. *Journal of global research in computer science. 3(11).*

Liu H. (2019). Factors influencing e-government implementation in least developed countries. A case study of Yemen. Provided by *International Institute of Science, Technology and Education (IISTE), E-Journals, Developing countries Studies* , 4(7).

Layne, K., & Lee (2021). Developing a fully functional e-government: A four stage model. *Government information quarterly, 18(2).*

Mcflesh, et al (2018) Liu Huang (2019) in Ali A. Al-Wazir & Zlao Zheng (2021). Factors influencing e-government implementation in least developed countries. A case study of Yemen. Provided by *International Institute of Science, Technology and Education (IISTE), E-Journals,, Developing countries Studies* , 4(7).

Marco et al (2019). *Government online.* SST publishers.

Mustafa, A., Anita A., Sare-Gul, S., Eda, Y., Murat K.G. (2018). An e-government project management approach with e-transformation perspective. I*nternational journal of e-business and government studies,* 6(1).

Murray, J. (2018). The GAP principles supporting IT projects and e-government through improved governance, architecture and procurement. *Microsoft.*

Nweke, A.E. (2017). Security of public records. *A seminar paper presented on public service effectiveness. pp.18-35.*

National Information Technology Development Agency (NITDA, (2019). *Nigeria e-government Interoperability Framework (Ne-GIF).*Release Vol. 2, July, 2019.

Nigeria's Global e-government ranking (2018). *Journal of internet and information system,* 2(1).

Ndukwe, E.C. (2018). From telecoms backwaters to a regional hub: Tracking the role of the regular Nigeria's telecom revolution. *Nigeria's Communication Commission presentation to NIEE, 2008. Distinguished Electrical and Electronics Engineering Annual Lecture.*

Obi H.O., Uzor O.A, Chukwurah, D.C. Jnr (2020). E-governance and service delivery in the Nigerian civil service. *World Journal of Innovative Research (*WJIR). 9(3).

Ogidan, J., Adekola O., Emmanuel G. Okogun, O. (2018). ICT for good governance and socio-economic development in Nigeria. *World scientific news,* WSN 72(217).

Organization for Economic and Cooperative Development, OECD (2018). *E-government Imperative.* Paris, OECD.

Manjot, K., & Amotoj, S. (2017). E-government: study of factors significantly affecting adoption and acceptance in state of Punjab. *European journal of research h and social sciences,* 5(4).

Palma C.J. and Sharma S.S. (2017*). E-government and e-governance: Definitions framework and statistic around the world*. New Delhi Computer Society.

Radriankrisman E.K. (2018). E-governance and service delivery *www.ezinarticles.com/e-governance* .

Seridan R. (2018). Study of impact of e-government projects in Indian centre for e-government, IM Ahmadabad, *Department of information technology, Government of India.*

Sorin B., Cristina A., Marcela M., and Maria-Lordeana, P. (2019). Sustainable e-governance and human resource development. *European journal of sustainable development* (2019), 8,(5).

Sheridam, W. & Riley, T.B. (2018). Commonwealth center for e-governance. *E-government monitor,* 2(1).

Speecher, M. H, (2010). Racing to e-government: using the internet for citizens service delivery. *Government finance review,* 16(5).

Tolulope, V.O, Duruyi, M.M, Adeyemi, J.O. and Oru, S.O, (2021). Effect of e-governance on public health sector in Nigeria. *Fiwukari journal of politics and development (FUWJPD).* 5(1).

Ugada, M.O (2022). Effect of New public management on the performance of the public sector of Nigeria (2008-2021). *International journal of economics and public policy (IJEPP).* 6(2).

United Nations e-governance Survey Report (2018). From e-government to connected governance. *United Nations department of economics and social affairs/division of public administration and development management* ST/EAS/SER E/112/New York.

United Nations Global e-government readiness report (2008). Towards access for opportunity: *Department of Economics and Social Affairs, Division of public administration and development management.*

United Nations e-government survey (2014). E-government for the future we want. *United Nations department of economic and social affairs/division of public administration and development management.*

UNDESA (2018). *Global e-government readiness report: From e-government to e-inclusion.* United Nations.

UN global e-government readiness report (2018). From e-government to e-inclusion. *United Nations Department of economic and social affairs, Division of public administration and development management New York.*

World Bank Development Report (2018). Quality and Quantity of public goods and services in developing countries. *https//web.worldbank.org.*

Willie, O. S. (2017). *E-governance and capacity building. Case study of local government areas in Ile Ife, Osun state of Nigeria.* National center of technology management (NACETEM), Obafemi Awolowo University, Ile Ife.

World Bank Development Report (2018). Digital dividends Available on *www.worldbank.org/en/publication/wdr/2016.*

Wikipedia (2018). Definition of e-government.

Yassine J. and Lin J. (2015). Implementation strategy of e-government system for emerging countries. *International journal for Information* (IJ), 8(2).