Legal and Political Studies International Journal
ISSN: 2997-4127 |
Volume 13 Issue 4, October-December, 2025
Journal Homepage: https://ethanpublication.com/articles/index.php/E17
Official Journal of Ethan Publication

PROSPECTS AND CHALLENGES OF APPLYING ARTIFICIAL INTELLIGENCE IN THE NIGERIAN IMMIGRATION SERVICE

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DOI: https://doi.org/10.5281/zenodo.17433241

Abstract
This study examines the challenges and prospects of integrating artificial intelligence (AI) in service delivery within the Nigerian Immigration Service (NIS). It investigates the potential benefits of AI for enhancing cross-border security, improving operational efficiency, and addressing administrative processes, while also evaluating the obstacles associated with its implementation. Using a qualitative descriptive research design, data were collected from secondary sources and analyzed through the lens of the Diffusion of Innovation (DOI) Theory. Findings reveal that AI implementation may raise concerns related to privacy, discrimination, and biases. Conversely, AI presents significant opportunities, including efficient immigration processing, secure identity verification at border controls, improved forecasting, and better resource allocation. The study concludes that, despite its challenges, AI adoption could substantially enhance service delivery in NIS. It recommends that the government and NIS management invest in the necessary infrastructure, provide staff training on AI applications, and address connectivity and internet accessibility issues to maximize the technology's potential.

Keywords: *Artificial Intelligence, Border Security, Immigration, Service Delivery, Technology*

Introduction

The Nigerian Immigration Service (NIS) is responsible for border management, migration regulation, and national security. Nevertheless, the service has a number of challenges, such as ineffective data management, lengthy wait times, and inefficient operations. The ability to identify fraudulent behavior and preserve national security is hampered by manual methods. Nigerian migration has always been extremely dynamic, with shifting trajectories and motivators as the country's population has become more determined to overcome ecological, social, economic, and environmental obstacles to ensure their wellbeing. Migration cannot be inevitable given the history of people, families, villages, and nation-states. Therefore, migration has a long history dating back to the dawn of humans, especially when that species was compelled to relocate in order to find food during various famine seasons (Aga, et al, 2023).

Immigration tends to imply higher risk even while it broadens the labor market and brings in fresh capabilities. It should be noted that Nigeria is not an exception to the growing issue of immigration, necessitating increased security and protection at her borders. Every country, developed or developing,

has placed a high premium on security. The immigration landscape is always changing, so keeping abreast with the most recent laws and fashions is crucial for expanding internationally. The immigration sector's increasing use of digital technology has sparked a trend toward artificial intelligence (AI) driven solutions, with immigration law and consulting businesses utilizing AI's capabilities to expedite the immigration process and give customers more in-depth insights into the legal requirements of their global expansion plans.

Artificial intelligence has the power to completely change how immigration services are offered in Nigeria. It can improve efficacy, security, and citizen satisfaction while also radically altering the way services are delivered. The breadth and speed of artificial intelligence (AI) technologies hold great promise for enhancing the efficiency of government service delivery; yet, these instruments must be utilized carefully to avoid automating biased or inaccurate findings. This is particularly important for public service delivery because governments are legally obligated to provide all prospective customers with equitable and trustworthy services (Wirtz & Müller, 2019).

The advancement of AI has greatly increased the potential to change governance practices and boost service delivery efficiency. Furthermore, artificial intelligence (AI) has such immense potential for automation, pattern recognition, and data analysis, it presents a viable answer to many of the issues that traditional governance systems face. Using AI technologies, governments can use them to make more decisions, move processes along more quickly, and provide better citizen services (ZeeBiz, 2023). Artificial Intelligence (AI) can be used by Nigerian immigrants to reimagine public services and governance, ushering in a new era of citizen-centric administration.

According to Shark (2021), machine learning—which provides insights into anomalies, patterns in data, and trend analysis—is revolutionizing artificial intelligence (AI) in the public administration sector. The simplest way to describe this shift is as "augmented intelligence." The most promising new technology in public management in decades, he observes, that artificial intelligence, or "augmented intelligence." In order to foster a positive AI environment as computing technologies progress, experts from disciplinary communities including science, philosophy, research, humanities, political science, history, ethics, psychology, management, and public policy think tanks as well as officials at the federal, state, and local levels must collaborate (Shark 2020). Considering the aforementioned, this study explores the use of artificial intelligence in the provision of services in Nigerian Immigration Service with a focus on the challenges and prospects

The growing patterns of immigration into the nation have presented challenges for the Nigeria Immigration Service (NIS) and the government body in charge of handling immigration. The fundamental issue is that illegal activity and criminal activity have surpassed the Nigeria Immigration Service's capacity to police borders over time. The service faces a number of challenges, such as poor data management, lengthy wait times, and ineffective operations. Manual procedures that make it more difficult to identify fraud and protect national security. The aim of this study is to investigate the potential benefits of artificial

intelligence (AI) integration in immigration services for addressing cross-border crime, ensuring precise and prompt operations, and evaluating the potential obstacles and opportunities associated with AI implementation. The study begins with the conceptualization of artificial intelligence and public service delivery, trace the historical overview of Nigerian Immigration Service, discussed the theoretical foundation of the study and review some empirical studies. Furthermore, the methodology, the prospects and challenges of AI were discussed before conclusion and recommendation were made.

CONCEPTUAL ISSUES

Artificial Intelligence

Artificial intelligence (AI) has been revolutionizing variety of sectors such as the finance, education, healthcare, and transportation sectors (Russell & Norvig, 2022). The term artificial intelligence is not widely defined. Russell and Peter (2021) describe artificial intelligence (AI) as computer systems or robots that think and act human-like by performing jobs that ordinarily require human intelligence, or that think and act rationally by putting logic first and carefully weighing all of the options. According to Abdelfattah et al. (2023), artificial intelligence (AI) is a collection of digital technologies that let computers learn and complete cognitive tasks on their own without assistance from humans. According to Wirtz and Müller (2019), artificial intelligence represents a completely new class of technical innovations that will not only enhance the efficacy and efficiency of public service delivery, but also radically alter the way services are delivered in the future and have an impact on how organizations are structured.

The public sector can use AI technology to revolutionize both policy and service domains, according to recent studies (Janssen & Kuk, 2016; Sun & Medaglia, 2019). There are two way this can be done. First is researching on the effects of technology on those employed in public administrations (Margetts & Dorobantu, 2019) and the second is on the ways in which the public interacts with public entities (Agarwal, 2018; Androutsopoulou et al., 2019).

An AI-powered communication approach is suggested by Androutsopoulou et al. (2019) to facilitate more citizen-government interaction and enhance service delivery. The field of generative artificial intelligence (AI) has become a disruptive force in the provision of public services by presenting innovative methods for raising citizen effectiveness, efficiency, and satisfaction. In applications like picture synthesis, natural language processing, and content generation, generative AI methods like Generative Adversarial Networks (GANs) and Variational Autoencoders (VAEs) have proven to perform extraordinarily well (Goodfellow et al., 2016). With the use of these models, public administrations can customize interactions with individuals, automate the development of documents, and analyze massive databases to gain actionable insights that facilitate decision-making. Moreover, generative AI implementations in public services can save money while improving the quality of the services and the pleasure of the populace (Moradi et al., 2021).

Public Service Delivery

Public service delivery, according to Oronsanye (2010), is "the process of meeting citizens' needs through prompt and efficient procedures." This suggests that citizens are at the center of the delivery of public services because of the close relationship between the government and the populace, which enables citizens' demands to be met promptly. This implies that, in the same way that the private sector considers its clients to be the "king," guaranteeing the provision of high-quality services, the public ought to be viewed as the "master" and the one who stands to gain from enhanced public service performance (Aladegbola & Jaiyeola, 2016). The body of research on the use of AI to public services points to both

According to Criado and Gil-Garcia (2019) and Criado et al. (2020), the adoption of AI significantly enhances citizen-centric services and municipal operations by automating repetitive processes and enabling more effective data management. Valle-Cruz et al. (2019), who note that AI's analytical capabilities have enhanced decision-making processes. Previous work by Criado et al. (2020) provides foundational insights into the early stages of AI implementation in public administration. Meijer (2018) highlights the significance of maintaining transparency and accountability in AI systems to lower the risks associated with algorithmic biases.

Artificial intelligence, according to Criado and Gil-Garcia (2019), is the development of computer systems that are able to learn, solve issues, and make decisions—tasks that ordinarily call for human intelligence. AI is beneficial to the provision of public services for the following reasons: putting together a service application; Predictive analytics to make data-driven decisions; Chatbots and virtual assistants to engage citizens; Automating routine operations and processes an observation and evaluation system

History of Nigerian Immigration service The government organization in charge of overseeing immigration in Nigeria is the Nigeria Immigration Service (NIS). Ever since it was separated from the Nigeria Police Force (NPF) in 1958, the NIS has undergone numerous modifications. The Chief Federal Immigration Officer (CFIO), who was initially Mr. EH Harrison, oversaw the Immigration Department, as it was then called, which was charged with carrying out the primary immigration tasks. The Immigration Ordinance of 1958 was the department's operational guideline when it was first established. When the agency was first established, its operational purview was limited, and it took a low-key, straightforward approach to achieving the government's stated aims and objectives. (NIS, 2024).

However, the Immigration Department officially came of age on August 1st, 1963, when it was created by an Act of Parliament (Cap I71, Laws of the Federation Nigeria). The department head was renamed the Director of Immigration. So, the initial group of immigration officials consisted of ex-NPF officers. As a Civil Service organization, it became a department under the direction and control of the Federal Ministry of Internal Affairs (FMIA). The title "Director of Immigration" was changed to "Comptroller General of Immigration Service" on October 1, 1992, as a result of institutional changes and a government white paper. This gave the Service paramilitary character. As a result, CGI Garba, the previous Director of Immigration, became the first Comptroller General of Immigration (CGI). (NIS, 2024).

. Subsequently, the Service has made great progress in reforming and restructuring itself in order to be in a better position to execute contemporary migration management. The organizational and operational structure of the Service underwent changes throughout this time, which were necessary to accommodate the increased responsibilities as well as the developing political alignments at the regional and sub-regional levels. These included the creation of the African Affairs and ECOWAS divisions, the management of the Border Patrol, alien control, and other newly assigned duties for the Service. Moreover, the Service was given full authority to issue all Nigerian travel papers, including Nigerian passports, in 1988 (NIS, 2024).

With the release of the Combined Expatriate Residence Permit and Aliens card (CERPAC) in 2001 and the Machine-Readable Passport (MRP) in June 1998, the Service embraced the use of ICT in its operations. It has since made enormous progress in integrating ICT into its operational procedures and processes. Most notably, it introduced online payment for its facilities, paving the way for e-revenue collections in Nigeria and making it the first government agency to adopt e-payments. NIS, 2024).

Under the direction of the then-CGI CJ Udeh OFR, the NIS introduced the e-Passport on May 17, 2007, in an effort to improve on the MRP and in accordance with International Civil Aviation Organization (ICAO) standards. This move cemented the Federal Republic of Nigeria's place in history as the first nation in Africa and among the first nations worldwide to do so. Since the epassport incorporates the biometric information of its holders, making multiple acquisition and identity theft difficult, its use has grown to be a key weapon in the battle against trans-border criminality (NIS, 2024).

In 2009, Nigeria was admitted as the only African representative to the Board of the International Civil Aviation Organization (ICAO), a global organization that sets standards for travel papers, in recognition of the strides made by the Nigeria Immigration Service. This development led to the installation of e-passport machines in every state in the federation as well as in some Nigerian missions overseas. In accordance with the Federal Government's citizen diplomacy foreign policy, the NIS has been dispatching personnel to all corners of the globe for passport intervention. This means obtaining and processing passports for Nigerians living abroad by using mobile passport issuance equipment (NIS, 2024).

The creation of a fully functional forensic laboratory to examine travel and other documents is another noteworthy accomplishment in the field of ICT development. It should be mentioned that the NIS employees who work in this lab are quite knowledgeable because they have received extensive training on document fraud detecting methods both domestically and abroad. On May 25, 2015, the National Assembly enacted the Immigration Act, which strengthened the NIS's legal foundation even more. As a result, the Act abolished the previously ineffective Immigration Act of 1963 and established the Migration Directorate for the Service, a new Directorate (NIS, 2024).

Since the NIS's founding in 1963, there have been nine (9) substantive comptrollers general, three (3) directors of immigration, three (3) Chief Federal Immigration Officers (CFIOs), and three (3) Acting Comptrollers

General. The current comptroller is breaking ground and taking massive steps to modernize and standardize the Service's operations while making sure that timely and effective service delivery to its numerous publics is not jeopardized (NIS, 2024).

Theoretical framework

Diffusion of Innovation Theory (DOI) serves as the foundation for this investigation. A theory that aims to explain how, why, and how quickly new concepts and technologies proliferate. Everett Rogers made the theory more widely known in his 1962 book Diffusion of Innovations (Rogers, 2003). According to Rogers, diffusion is the process by which an innovation spreads over time among members of a social system through certain channels. The spread of innovations theory has a wide range of disciplinary roots. According to Rogers, a new idea can spread due to five primary factors: the innovation itself, adopters, communication routes, time, and a social system. The social capital of this process is crucial. For the innovation to be self-sustaining, it must be universally embraced. An innovation reaches critical mass within the adoption rate at some time. Diffusion of innovation theory is based on logical ideas of organizational life that are drawn from the fields of sociology, management, and communication theory.

In order to help people who implement technologies encourage the acceptance of specific technologies, it forecasts explanations of the diffusion phenomena. In general, the DOI tradition has tried to explain individual adoption decisions or intents to adopt when it comes to well-defined innovations and relatively homogeneous populations. According to Rogers (2003), diffusion is "the process by which an innovation is communicated among the members of a social system through certain channels over time."

As a result, diffusion is regarded as a special form of communication in which people create and share knowledge with one another in order to reach a consensus. Because the idea being communicated in the communication is novel and involves some degree of uncertainty, diffusion takes on a special dimension. Rogers (2003) defines uncertainty as "the degree to which several alternatives are perceived with respect to the occurrence of an event and the relative probabilities of these alternatives". The DOI, he explained, is "an uncertainty reduction process and proposed attributes of innovations that help to obtain more information and decrease uncertainty." This helps to reduce uncertainty. According to Rogers (2003), an innovation is "an idea, practice, or object perceived as new by an individual or other unit of adoption"

Rogers describes a technology as "a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome." But he contends that because a technical invention is novel to the individual, it also breeds a different kind of uncertainty, leading that person to look for knowledge that would allow them to assess the new concept.

The DOI emphasizes the establishment of a technology service delivery system for Nigeria's immigration agency through the application of artificial intelligence. Through technological enhancements such as automating routine tasks and citizen satisfaction, border control and sport issuance processes, and strengthening the nation's security system through a technologically driven fraud detection machine or application, it will improve the efficiency and accuracy of service delivery in the Nigerian immigration

service. This study promotes the acceptance and implementation of AI-powered service delivery in the Nigerian immigration service by utilizing the DOI theory.

Review of Empirical Studies

The earliest known AI work was produced in 1943 by Warren McCulloch and Walter Pitts using a model of artificial neurons that had "on" and "off" labels. In 1950, Dean Edmonds and Marvin Minsky developed the first neural network computer. The creation of the Turing Test in the 1950s is the most well-known aspect of Alan Turing's contributions (Russell & Norvig, 2013). In terms of cost effectiveness, enhanced communication and coordination within and between organizations, and increased citizen participation in government policy and programs that promote accountability, academics have characterised artificial intelligence (AI) as a tool of the fourth industrial revolution that has the potential to benefit businesses, citizens, government organizations, and public service operations (Goodell, et al, 2021).

Numerous industries have benefited from research in machine learning (ML) and artificial intelligence (AI), which has also enhanced people's lives. Apart from the enormous benefits that artificial intelligence has already brought about, it is still showing signs of great advancement that could have an impact on people's lives and advance economic and societal progress in a range of fields, including law, health, security, and transportation. Nonetheless, there are still technological, sociological, ethical, and legal concerns with artificial intelligence (Thiebes et al., 2021). Artificial intelligence systems are now less trusted as a result of certain worries.

AI systems may swap out people's faces in a video (deep fakes) (Adam et al., 2020), be biased toward particular populations (Ghassemi et al., 2021; Obermeyer et al., 2019; Alikhademi et al., 2021), or use clear view AI to monitor people without their consent (Thiebes et al., 2021; Hill et al., 2020).

Giuste et al.'s (2022) systematic review of XAI for pandemic mitigation was carried out in 2022. Based on the lessons learnt from COVID-19, they examined XAI strategies that increase the use of AI in their work. They stressed that developers need to know how an AI decision system arrived at its decision because clinical data is risk-averse. Giuste et al. (2022) found that bias detection and pattern recognition in the data, along with the confidence that comes from unbiased data, are helpful and will enhance patient care.

Since there are no measurable ways, it is challenging to determine whether the publications have reached XAI. Still, there is a difference in terms of users.

The method of creating YouTube's problem for certain users should involve users. The public sector can use AI technology to revolutionize both policy and service domains, according to recent studies (Janssen & Kuk, 2016; Sun & Medaglia, 2019). After social media, robotics, and big data in the field, AI technology integration in public service delivery is considered the fourth wave of Information and Communication Technologies (ICTs). Emerging technologies like artificial intelligence (AI) have the potential to spur revolutionary methods in the public sector, claim Criado and Gil-Garcia (2019).

According to Criado et al. (2013), social media can foster innovation within public sector organizations. Moreover, Criado et al. (2020) discovered that algorithms and artificial intelligence (AI) have the power to

completely transform important facets of public sector organizations and the people who work there. Valle-Cruz (2019) also talked about the potential for modern, intelligent technology to enhance e-government services in nations that have gone digital. The shift in government organizations toward a technology-centric approach to service delivery encourages citizens to receive services via digital platforms while preserving the quality of those services (Wirtz & Müller, 2018; Nakolisa, 2023).

Artificial intelligence is enabling a wave of change in public service delivery that spans functional areas like performance assessment, strategic management, human resource management, and institutional communication, as well as policy areas like education, health, customer service, tax, social benefits, border control, and emergencies (Wirtz et al., 2019). These domains depend on the volume of open and large data as well as the processing power of the company (Burrell, 2016; Margetts, 2017). These serve to highlight the various ways in which artificial intelligence (AI) can be fully employed to deliver services in an efficient manner.

Methodology

The qualitative descriptive research design was utilized in this study to gather, analyse, and interpret data. Data were collected through secondary sources. The researchers relied mostly on information from articles, internet, books, NIS website etc.

True to Support AI Adoption.

Prospects of Deployment of AI in Immigration

The integration of artificial intelligence (AI) in immigration departments has significant implications for service delivery

i. Automated Processing: Compared to manual procedures, AI systems can assess and process immigration applications more quickly. For example, Brazil intends to use AI to speed up applications for residency permits and cut down on administrative wait times.

ii. Biometric Identification: To enable quicker and more secure identity verification at border controls, nations like the United Arab Emirates have embraced AI-driven biometric technology, such as iris scanners. This improves security protocols while also expediting the immigration procedure.

iii. Data analytics: To improve forecasting and resource allocation, AI methods are used to evaluate big datasets pertaining to immigration trends and visa applications. This capacity helps immigration officials to effectively handle rising demand.

iv. Fraud Detection: As evidenced by France's impending AI ambitions, AI technologies are being utilized to detect fake documents in immigration applications. The integrity of the immigration systems is preserved by this application.

v. Regular processes are automated by AI, which boosts production and efficiency. This suggests that artificial intelligence can be used to speed up the process of obtaining a visa, help guard the border, and enhance the effectiveness of Nigeria's immigration department.

vi. Increased accuracy: AI lowers error rates, leading to reliable and highcaliber service delivery. This indicates that artificial intelligence (AI) has the ability to improve the professionalism of Nigeria's immigration services and make them more competitive with others across the globe.

vii. Improved accessibility: AI-powered services can reach a wider audience, including people with disabilities

viii. Improved Security: AI technology can prevent and detect fraudulent actions like identity theft and document forging.

ix. Predictive Analytics: AI can help prevent cross-border crimes such as human trafficking and migrant smuggling.

x. Increased accessibility: Services driven by AI can connect with a larger audience, which includes those who are disabled.

xi. Enhanced Security: AI technology has the ability to stop and identify fraudulent activities like document forgery and identity theft. xii. Predictive Analytics: AI has the potential to stop transnational crimes like migrant smuggling and human trafficking.

Challenges of Deployment of AI in Immigration

Despite the operational benefits, the deployment of AI in immigration raises significant ethical issues:

i. Privacy and monitoring: Individuals' rights to privacy may be violated by the use of AI for data collecting and monitoring. Artificial intelligence (AI) technologies have the ability to track and monitor migrants in ways that could be considered intrusive, raising worries about the misuse of personal data.

ii. Discrimination and Bias: AI algorithms may unintentionally reinforce prejudices found in their training sets, which could result in biased judgments. This is especially troubling in immigration circumstances, when skewed results may disproportionately impact marginalized communities.

iii. Transparency and Accountability: Accountability is made more difficult by the opaque nature of many AI systems. It may be difficult for immigrants to comprehend the decisions that impact their status, which raises questions about the fairness and openness of immigration procedures.

iv. Public approval is another prerequisite for the effective integration of AI in immigration services. According to studies, public trust in AI systems is essential for their successful integration into public services. Governments using AI tools must also negotiate a complicated legal environment to guarantee that data protection regulations are followed.

v. Cybersecurity Risk: Stringent security measures are required because Nigeria's AI systems are susceptible to cyber-attacks.

vi. The Nigeria Immigration Service Requires Technical Capacity and Infrastructure to Support AI Adoption.

Conclusion

Artificial intelligence (AI) has a huge impact on the provision of immigration services; it presents both substantial ethical challenges and improved efficiencies. For instance, the US Immigration service has used

the AI to automate the processing of certain immigration application such as the form 190 to replace permanent resident card. This is due to its efficiency. Just as the Canadian government used AI-powered facial recognition technology to verify the identification of applicant for electronic travel authorization (eTA). Immigration authorities must weigh the advantages of greater security and productivity against the need to uphold human rights and treat everyone equally as they continue to implement new technology. It is imperative for policymakers to maintain a watchful eye on the potential effects of artificial intelligence (AI) and to cultivate a climate in which technology advances, rather than erodes, the principles of openness, responsibility, and individual liberties.

Recommendations

i. The government and management of NIS should invest more in infrastructure to enable the service to key into the potentials of artificial intelligence. However, NIS must ensure that Individuals' rights to privacy is not violated due to the use of AI in its operations.

ii. As a follow up to the development of infrastructure, the government should provide training for staff and management of NIS on the use of artificial intelligence so as to ensure effective and efficient use of AI tools.

iii. The issue of data connectivity and internet should also be address since AI is driven by data and internet.

iv. Nigerians should be properly oriented on the benefits of the use of artificial intelligence in service delivery

v. The government should develop ethical guideline for the adoption of AI in Nigeria public service.

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