

# Leveraging Decision-Making Artificial Intelligence Techniques for the Implementation of Policies on Nigerian Indigenous Languages

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## **Abstract**

*The lingering issues of language policy implementation in Nigeria can be addressed significantly using decision-making artificial intelligence (AI) techniques. This study argues that AI decision-making techniques can be leveraged for effective implementation of policies on Nigerian indigenous languages. The study seeks to draw evidence from extant studies to show that AI techniques can be used to achieve successful implementation of language policies in Nigeria. Thus, data are sourced from secondary materials online. The data are subjected to a critical systematic review after applying exclusion and inclusion criteria. The results show that the different techniques of Natural Language Processing (NLP), Machine Learning (ML), Deep Learning (DL), Internet of Things, and Reinforcement Learning have the potentials to cause effective, functional and sustainable decisions on the implementation of Nigerian indigenous languages. The study concludes that with AI techniques, stakeholders can make positive and impactful decisions on the implementation of national language policies and prompt their growth, development and sustainability. It calls on stakeholders to key into the trends of using AI for problem-solving. The challenges to adopting AI should also be addressed significantly by stakeholders. Mass sensitization is another way-out.*

**Keywords:** *Decision-making, Artificial intelligence, Techniques, Policy implementation, Indigenous languages*

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## **I. Introduction**

Artificial intelligence can be leveraged to address issues of language policy implementation in contemporary Nigeria. In other words, the lingering issues of language policy implementation in Nigeria can be addressed significantly using decision-making artificial intelligence (AI) techniques. The issues include official language preference and exaltation, educational challenges, inconsistent policies, the absence of political will, corruption and bad governance, multilingualism, social factors like negative attitude and perception, resource constraints, cultural identity, ethnicity and religiosity, and migration and urbanization. Language issues arising from policymaking are critical issues of society. Mungoli (2023) argues that AI can be leveraged for various purposes in different fields, such as healthcare, education, agriculture, and societal issues.

AI is affirmed to be particularly beneficial to healthcare, education, agriculture, smart mobility and technology, and smart cities (Ro, 2018). This study holds that AI is also beneficial to policymaking, governance and linguistics. The National Strategy for Artificial Intelligence Bangladesh (2020) notes that AI exhibits the capacity of machines to perform psychological errands like reasoning, seeing, learning, critical thinking and

basic leadership. Thus, it is apt to leverage AI for policymaking and policy implementation in Nigeria and beyond. There are studies affirming the viability of language-based techniques in addressing various problems in society. These include Anyanwu (2023), Danjuma et al. (2023), Nkereuwem (2023), Nkereuwem and Robert (2023), Nwode (2023), Robert (2022, 2021 & 2018), Franz and Murphy (2018), Osuagwu and Chimakonam (2018), Oyedeji (2018), Emeka-Nwobia (2015), Dibie and Robert (2014), Prah (2009), Uche (1994), and Ubahakwe (1979).

In the same vein, there are also numerous studies affirming the viability of AI techniques in solving various problems. These include Akinola (2024), Akinola et al. (2024), Kodete et al. (2024), Nwadinobi et al. (2024), Nwosu et al. (2024), Obiuto et al. (2024), Okusi (2024a&b), Oyeyemi et al. (2024), Pasupuleti et al. (2024), Thuraka et al. (2024), Juhrich (2023), Ivanova et al. (2023), Regona et al. (2023), Kochovski and Stankovski (2021), Artificial Intelligence Bangladesh (2020), and Yigitcanlar et al. (2020). In view of the foregoing, this study is aimed showing that AI techniques can be leveraged (used) to achieve successful implementation of language policies in Nigeria, drawing evidence from extant studies.

### **Gap in Literature and Novelty of the Study**

There is no doubt that there are studies engaged with AI in various fields in Nigeria. Those listed above are among such studies. However, none of the studies engage with leveraging the decision-making techniques of AI for the attainment of effective implementation of language policies in Nigeria. That is, the novelty of this study rests on its unique engagement with the capability of AI to help address the challenges of policies on languages in Nigeria. Its proposal is unique, problem-solving, tech-savvy, innovative, and result-oriented. The study bridges the erstwhile laid-bare knowledge gap on the place of AI in decision-making on indigenous languages. The scope concerns of the study make it uniquely significant.

The need for favorable and worthwhile policies on language cannot be overemphasized. This is particularly so in that language plays a crucial role in all human endeavors, including AI formation, uses, discourses, application, and all that concerns it. The place of language in AI is demonstrated by Nwosu et al. (2024), who show that language can serve as a viable mechanism for ensuring ethical use of AI among students. Be it so, it is crucial to have worthwhile and favorable language policies in Nigeria and beyond. The dire need for the aforementioned informed this study. In other words, it is in search of betterment that this study proposes the leveraging of AI decision-making techniques for the implementation of language policies in Nigeria.

## **II. Methodology**

The study relied on secondary data, sourced from online. The search focused on reputable databases, search engines, and sources available on Google Scholar, ResearchGate, Academia.edu, Semantic Scholar, and Microsoft Academic. Afterwards, the data were subjected to a critical systematic thematic review, applying exclusion and inclusion criteria. As Saunder et al. (2023) note, the data for systematic review include articles, diaries, blog posts, interview transcripts, theses, web pages, social media, audio narrations or messages, and video files. Here, articles, theses and the likes were relied on. As Nunn and Chang (2020), and Grant and Booth (2009) note, there are four stages of systematic review. These are:

- ❖ Familiarizing with the thematic concerns
- ❖ Identifying the thematic framework
- ❖ Indexing of themes and codes
- ❖ Mapping and interpreting the collected data, relating them to the research objectives and questions.

Applying exclusion and inclusion criteria of systematic review, some of the sourced data were excluded from the study, while others were included. While those not directly related to the theme of the study were excluded, the closely related ones were included. The findings of secondary data constitute the evidence for a systematic review study (Saunder et al., 2023). Thus, this study draws evidence from the findings of the secondary data relied on. Following the adopted qualitative method and the analytic descriptive design, thematic and content analyses were employed in synthesis and analysis of the used data. Interpretive and descriptive techniques were employed for the data analysis.

### **AI Technologies, Functions and Benefits**

AI is made up of different technologies that play both independent and interdependent functions. In other words, there are different technologies of AI. These technologies play functions that are beneficial to humans and the non-humans in various endeavors. The popular ones are contained in the Table below:

**Table 1: AI Techniques for Optimized Decision-making**

AI technologies	Citations
	Adeyemi et al. (2024)
	Akinola (2024)
	Akinola et al. (2024)
	Alsakka et al. (2023)
	Ivanova et al. (2023)
Automated Machinery Systems	Kim et al. (2015)
Blockchain	Kodete et al. (2024)
Computer Vision	Naser (2019)
Deep Learning	Nikitas et al. (2020)
Digital Image Analysis	Ojo and Aghaunor (2024)
Faster R-CNN	Okusi (2024a&b)
Internet of Things (IoT)	Pasupuleti et al. (2024)
Machine Learning	Peramo et al. (2024)
Natural Language Processing	Qasim and Kharbat (2020)
Reinforcement Learning	Rasheed et al. (2024)
Robotic Process Automation	Regona et al. (2023)
	Srivastava (2021)
	Thapaliya and Bokani (2024)
	Vantara (2020)
	Wusu et al. (2022)

Source: Authors, 2024

The above listed AI technologies are also regarded as techniques of AI. Among the above listed AI techniques, those having the highest capacities and impacts in the context of this study are Natural Language Processing (NLP), Machine Learning (ML), Deep Learning (DL), Internet of Things, and Reinforcement Learning. These AI techniques undoubtedly have the potentials to cause effective, functional and sustainable decisions on the implementation of Nigerian indigenous languages.

Each of the technologies has several components and techniques. They have the capacity to influence, improve, optimize and transform decision-making on any matters, such as decisions on language matters. Yigit et al. (2018) are of the view that AI technologies have to be integrated into other measures or systems for better results. The summarized views of several other scholars on AI in the education sector are presented in the Table 3 below:

**Table 3: Scholarly Evidence for AI Benefits in the Education Sector**

Citations	Submissions
Niedbała et al. (2023)	ChatGPT, an AI language model, is used for carrying out different tasks; it is revolutionising the way information is being sourced and used for personal and professional purposes.
Ganeesh and Rani (2023)	AI plays a crucial role in the teaching of English language in the 21st century.
Nguyen et al. (2023)	AI techniques have been offering better understanding of students' performance and learning challenges, while at the same time transforming the education sector with its activities.
Kushmar et al. (2022)	AI has been transforming different educational activities, increasing effectiveness and competitiveness, and empowering teachers and students across all tiers of education. Human experts skilled in content designing and language education are needed for the attainment of efficacious language learning using AI.
Dewi et al. (2021)	AI can be used to develop English learning materials for students.
Fokides and Mastrokourou (2018)	Students taught using tablets outperformed over their counterparts taught without using tablets.

In what lends credence to the above, Ojo et al. (2024) emphasize that AI technologies play critical role in addressing different problems. They can be leveraged for resilience, optimization, efficiency, large data, information management and security, improvement and innovations. Through these, among the other impactful functions of AI, the benefits of AI are realized variously. Obviously, if integrated into policymaking and implementation, as in language policies, better results would be realized. The following Table 4 contains a summation of the functions and benefits of AI:

**Table 4: General Functions & Benefits of AI**

Functions	Citations
Accuracy and accountability	Adefemi et al. (2023)
Advancement	Akinola (2024)
Compliance management	Akinola et al. (2024)
Data-driven decision-making	Baker et al. (2020)
Digitalization	Bidhendi and Azizi (2021)
Enhancing teaching and learning	Bulama and Shirivastata (2022)
Ensuring and increasing safety	George et al. (2022)
Improving performance, services and operations	Jarrahi (2018)
Incident reporting and response	Juhrich (2023)
Influencing effective planning	Kamble and Gaikwad (2024)
Innovations	Mizrak (2023)
Inventions and discoveries	Obiuto et al. (2024)
Massive data creation, storage, dissemination and management	Regona et al. (2022)
Mitigating challenges to environmental sustainability	Regona et al. (2023)
Optimization	Roshanaei et al. (2024)
Predictions and detections	Shaikh et al. (2022)
Reducing costs	Singh (2024)
Saving time and resources	Srivastava (2021)
	Thakkar and Lohiya (2021)
	Thuraka et al. (2024)
	Vantara (2020)
	Wang (2019)

Source: Okusi (2024b)

Clearly, AI plays varied functions. It is thereby of huge benefits to humans and phenomena in various regards at a great extent. Adelani et al. (2024) and Govea et al. (2024) emphasize that the functions of AI, such as identification and prediction, are the base of its importance and impact. Binhammad et al. (2024) agree that AI models (techniques) have the capacity to organize, optimize, audit, provide large data, and strength human functions and performances, to mention but a few. Considering the commonly affirmed functions of AI, with which it has been impacting significantly on various spheres, this study argues that AI decision-making techniques can be leveraged for effective implementation of policies on Nigerian indigenous languages.

### The Imperative of Leveraging AI Techniques for Policymaking

Policy is described as “a plan or course of action” by a government or an organization, which is thought to “be prudent or tactically-advantageous” (Ahmed & Muritala, 2020, p. 331). This means that policies on indigenous languages are strategies or course of actions by government on language use in society. Ogbonnaya (2013) describes policy as what serves as a blueprint for official action that impacts on the general populace. Ahmed and Muritala (2020) and Afolayan (1999) indicate that indigenous languages serve two basic purposes in the education system of a nation, which are serving as:

- (i) Modes of acquisition of knowledge, skills and attitudes in the educational process, and
- (ii) Means of the preservation and positive utilization of cultures and language as symbol of national unity.

In making policies, different decisions and actions are taken. In the course of doing so, wrong decisions and actions are taken. If left uncorrected, they consistently impact negatively language users as well as the society at large. To avert as well as address such wrongs and the adverse effects of policy lapses, it is imperative to leverage AI techniques for technology-based solutions and innovations.

That is why this study makes a case for the leveraging of decision-making techniques of AI for effective implementation of policies on Nigerian indigenous languages. Although language-based techniques can serve as viable techniques for addressing various issues in society, deploying technological and AI-driven techniques would yield more results. The Table 5 below contains highlights of the viewpoints of some other authors in the literature:

**Table 5: Empirical Viewpoints for Further Scholarly Evidence**

Citations	Submissions
Ganeesh and Rani (2023)	The AI technologies involved in teaching and learning include intelligent tutoring systems, virtual language assistants, and language learning apps.
Huang (2021)	The benefits of AI tools include assisting students to keep track of studies, create result-oriented academic plan, acquire problem-solving and critical thinking skills, and identify educational needs that foster self-reliance and growth.

Umoren et al. (2021)	AI helps arm humans with analytical skills.
Mohammad and Mansour (2020)	AI-based method is characterized by computer software packages for educational purposes.
Jain and Jain (2019)	The prospects of AI are what ground its adoption.

Source: Authors, 2024

It is evident from the above table that the prospects of AI techniques are what make AI very important and innovative. The advocacy for its adoption in policymaking also rests on the functions and benefits of AI. By leveraging AI techniques for solutions to language policy issues, the conventional approaches to solving the issues would be improved, optimized and transformed. Basically, leveraging AI for policymaking entails computerizing or optimizing everything about policymaking for betterment.

By so doing, everything about it gets enhanced and transformed and more results are bound to be obtained. Most importantly, leveraging AI for policy implementation allows for the realization of the problem-solving potentials of AI technologies. Various human efforts and performances in policymaking are improved, optimized, and made more efficient and productive, when AI is leveraged for policy purposes.

### III. Conclusion

It is quite obvious from all indications that AI techniques can be leveraged for effective policy implementation in Nigeria. The techniques can also be particularly leveraged for the implementation of policies on Nigerian indigenous languages. Leveraging AI techniques for policymaking and implementation purposes would transform, optimize, and improve the ways in which policies are implemented. As a result of these, enhanced data analysis, equitable resource allocation, better public engagement, effective planning, adequate budgeting and expenses, improved performance and service delivery, and effective evaluation and monitoring would obtain at a significant level. Therefore, the study concludes that with AI techniques, stakeholders can make positive and impactful decisions on the implementation of national language policies and prompt their growth, development and sustainability.

### IV. Recommendations

The following recommendations are made:

- ❖ Stakeholders should key into adopting and using AI for problem-solving purposes.
- ❖ The challenges to adopting AI should be addressed significantly by stakeholders by developing various pragmatic means of addressing them.
- ❖ Increased creation of awareness would keep the masses well sensitized about AI alongside its benefits and associated challenges.
- ❖ Ethical considerations and governance, environment-friendly and AI-driven policies should be enacted, made operational, and sustained.

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