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Humanities, Artificial Intelligence and the Decolonisation of Infrastructure Governance in Nigeria: Towards Inclusive and Sustainable Development

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Abstract

Infrastructure has played a central role in the political economy of Nigeria, state formation and development. From precolonial systems of mobility, markets, water management and urban organisation to colonial railways, roads, ports and telecommunications, infrastructure has reflected prevailing relations of power and economic interests. The colonial infrastructure largely served administrative control, resource extraction and the movement of goods rather than balanced development. Although post-independence governments sought to redirect infrastructure towards national integration and socioeconomic development, but colonial institutional structures, spatial inequalities and technological dependencies have persisted. The emergence of Artificial Intelligence (AI) offers new opportunities for infrastructure governance through predictive maintenance, transport management, electricity and water distribution, urban planning, procurement and citizen participation. However, uncritical dependence on foreign technologies, datasets and algorithms may reproduce existing inequalities in digital form. Using a historical and decolonial approach, this paper examines the relationship between the humanities, AI and infrastructure governance in Nigeria. It argues that decolonisation requires more than replacing foreign technologies with local alternatives; it demands transformation of the knowledge, institutions, values and decision-making processes that shape infrastructure development. The paper advocates a humanities-informed, people-centred framework integrating historical consciousness, indigenous knowledge, ethics, local languages, participation and spatial justice. It concludes that AI can promote inclusive and sustainable development only when locally grounded, ethically governed and directed towards citizens' needs.

Keywords: Artificial Intelligence, Humanities, Infrastructure Governance, Decolonisation, Indigenous Knowledge, Sustainable Development, Nigeria.

1. Introduction

Infrastructure is more than the physical foundation of economic and social life. Roads, railways, ports, electricity, water, telecommunications, schools, hospitals and digital systems reflect political authority, economic priorities and social values. They shape access to mobility, trade, communication and essential services. Infrastructure governance is therefore closely linked to power, development, inclusion and inequality.

In Nigeria, infrastructure predates colonial rule, this is based on the fact that the Nigeria's precolonial societies developed systems of mobility, trade, water management, markets, settlement and knowledge transmission adapted to local conditions. Colonialism therefore did not introduce infrastructure into an empty space; rather, it reorganised existing systems and constructed new

networks largely for administrative control and economic extraction. The railways, roads, ports and communication facilities provided by the colonialist was facilitate the movement of agricultural and mineral resources towards coastal centres, creating spatial patterns that reflected colonial priorities rather than balanced development.

Thus, the attainment of independence in 1960 repositioned infrastructure as an instrument of national integration, economic growth and social development. However, inherited institutional structures, spatial inequalities and technological dependencies persisted. Nigeria's infrastructure challenge which was not only a problem of inadequate facilities but also one of infrastructure governance who determines priorities, controls resources, adopts technologies and benefits from infrastructure.

The emergence of Artificial Intelligence (AI) introduces both opportunities and risks. AI can support predictive maintenance, transport management, electricity and water distribution, urban planning and public procurement. However, dependence on foreign technologies, datasets and algorithms may reproduce existing inequalities in digital form. AI systems are not entirely neutral because they reflect the data, assumptions and institutional priorities embedded in their development.

The humanities are consequently important to AI-enabled infrastructure governance. History exposes the roots of present inequalities, while ethics, philosophy, cultural studies, indigenous knowledge and local languages provide perspectives for responsible and socially responsive technological development.

This paper asks whether AI can contribute to the decolonisation of infrastructure governance in Nigeria or reproduce colonial and postcolonial inequalities through new technologies. It argues that AI is neither inherently liberating nor oppressive; its impact depends on the political, historical, ethical and institutional conditions governing its use. Decolonisation therefore requires transforming the knowledge systems, institutions and decision-making processes that shape infrastructure development. The paper advocates integrating AI with the humanities, historical consciousness, indigenous knowledge and participatory governance to advance inclusive, accountable and sustainable infrastructure development in Nigeria.

2. Conceptual Clarifications

This study is anchored on five interrelated concepts: infrastructure, infrastructure governance, decolonisation, Artificial Intelligence (AI), and the humanities. These concepts are not treated as isolated definitions but as analytical tools for examining how infrastructure in Nigeria has been shaped by technology, institutions, historical power relations and competing forms of knowledge. Their application enables the study to move beyond viewing infrastructure as physical construction to understanding it as a political, social, technological and knowledge-based process.

Infrastructure is understood broadly as the physical, institutional and digital systems that sustain social, economic and political life. It includes roads, railways, ports, electricity, water, schools, hospitals and telecommunications, as well as broadband networks, data centres, cloud computing and digital platforms. In this study, infrastructure is examined historically, from precolonial systems of mobility, markets and water management through colonial railways, roads and ports to postcolonial public infrastructure and contemporary digital systems. The concept is therefore applied to assess how different infrastructure regimes have served particular economic, administrative and social priorities and how AI can support their planning, maintenance and equitable distribution. Nigeria's National Artificial Intelligence Strategy identifies infrastructure, connectivity, data and human capacity as essential foundations for AI development.

Infrastructure governance refers to the institutions, policies, actors and processes through which infrastructure is planned, financed, constructed, maintained, regulated and used. It involves government at federal, state and local levels, private organisations, professionals, communities, civil society and citizens. Within this study, the concept is applied to examine who makes infrastructure decisions, whose interests influence those decisions, how resources are allocated, how projects are monitored and maintained, and how citizens participate in infrastructure-related decisions. This approach highlights infrastructure governance as both a technical and political process involving power, resources, knowledge and accountability. It also provides a basis for assessing whether AI-enabled systems can improve transparency, predictive maintenance, procurement monitoring and

equitable service delivery without reproducing existing governance weaknesses.

Decolonisation is understood as a continuing process of challenging the intellectual, institutional and structural legacies of colonialism rather than merely celebrating political independence. Frantz Fanon and Ngũgĩ wa Thiong'o demonstrate how colonial domination can persist through systems of knowledge, culture, language and institutional authority. In this study, decolonisation is applied to infrastructure governance by questioning inherited infrastructure priorities, examining the colonial origins of spatial inequalities and resource-oriented infrastructure, recognising indigenous and community knowledge, promoting Nigerian languages and strengthening local technological capacity and ownership. The concept therefore provides a critical mindset for asking whether contemporary AI systems merely reproduce inherited patterns or can help correct them.

Artificial Intelligence refers to computational systems capable of performing functions such as learning, prediction, pattern recognition, language processing and decision support. In this study, AI is examined as a potential instrument for transforming infrastructure governance through applications such as predictive maintenance of roads and electricity systems, intelligent transportation, energy optimisation, water management, urban planning, infrastructure mapping, procurement analytics and citizen-reporting platforms. However, the study does not assume that technological efficiency automatically produces social progress. AI systems are assessed in relation to data quality, algorithmic bias, transparency, privacy, accountability, local representation and technological dependence. The central concern is therefore not simply what AI can do, but whether it can be governed in ways that advance equity, sustainability and public accountability.

The humanities comprise disciplines concerned with human experience, history, culture, language, philosophy, ethics, values and meaning. In this study, the humanities provide the critical and interpretive framework necessary for understanding the historical and social consequences of AI-enabled infrastructure transformation. History, for example, helps identify how colonial and postcolonial infrastructure policies produced enduring spatial and socioeconomic inequalities; philosophy and ethics provide principles for evaluating fairness, responsibility, human dignity and accountability; anthropology and cultural studies illuminate indigenous knowledge and community practices; while language and literary studies highlight the importance of Nigerian languages and cultural representation in digital systems. The humanities therefore complement technical disciplines by asking whose knowledge is represented, whose values are embedded in AI systems, who controls technological resources and who benefits from infrastructure development.

The analytical relationship among these concepts is therefore central to the study. Infrastructure constitutes the material and digital foundation of development; infrastructure governance determines how that foundation is planned, financed, controlled and maintained; AI provides new capabilities for analysing data and managing infrastructure; decolonisation interrogates the historical structures of power, knowledge and dependency embedded in infrastructure systems; while the humanities provide the historical, ethical, cultural and human-centred perspectives necessary to guide technological change. Together, they establish the study's conceptual framework for evaluating whether AI can contribute to a more inclusive, accountable, and sustainable and locally grounded model of infrastructure governance in Nigeria.

In practical terms, the framework applies a five-dimensional analytical sequence: What infrastructure exists and whom does it serve? Who governs and controls it? What historical inequalities shape its distribution? How can AI improve its management without reproducing those inequalities? And what role should humanistic knowledge play in determining the values and purposes of technological transformation? These questions enable the study to connect Nigeria's infrastructure history with contemporary debates on AI, technological sovereignty, social justice and sustainable development. The ultimate concern is therefore not technological modernisation for its own sake, but the development of an infrastructure governance system in which technology serves human needs, local knowledge informs decision-making, historical inequalities are recognised and corrected, and citizens participate meaningfully in determining the future of infrastructure development.

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Historical Evolution of Infrastructure Governance in Nigeria

Understanding contemporary infrastructure governance in Nigeria requires attention to its historical development. Infrastructure did not begin with colonialism; rather, colonial rule transformed existing systems and introduced new networks whose spatial and institutional legacies continue to influence development.

The precolonial Nigerian societies developed and adopted local systems of roads, footpaths, markets, trade routes, river transport, wells, irrigation, defensive structures and urban settlements. Among the Hausa city-states, Kanem-Borno, Oyo, Benin, Nupe, Igbo societies and other communities, such systems supported commerce, agriculture, political administration, religion, security and social organisation. Long-distance trade also connected Nigerian societies to wider West African and trans-Saharan networks.

Although these systems differed from modern infrastructure, they represented practical responses to local economic, environmental and political needs. Recognising these systems is essential to decolonial history of infrastructure, since beginning the narrative with colonial rule would overlook indigenous knowledge, agency, innovation and adaptive practices.

On the other hand the British colonial rule substantially transformed Nigerian infrastructure through railways, roads, ports, telecommunications, public works and administrative centres. These developments, however, were closely linked to colonial economic and administrative interests. The Lagos railway began operations in 1898, and the railway network was progressively extended northward, with the Lagos–Kano system completed in 1912. The Eastern Railway subsequently connected important resource-producing and commercial areas with Port Harcourt and other centres.

Hence, colonial infrastructure consequently served not only transportation and communication interest but also territorial administration and economic extraction. Its spatial concentration created enduring infrastructural and regional legacies, as communities connected to major railway, port, commercial and administrative corridors generally enjoyed greater infrastructural attention than many peripheral areas. These historical patterns remain important for understanding contemporary inequalities and the continuing challenge of reorienting infrastructure governance towards equitable national development.

The attainment of Nigerian Independence in 1960 created expectations that infrastructure would serve national integration, economic growth and social development rather than colonial extraction. Successive governments expanded investment in roads, electricity, telecommunications, education, health and urban development, while the petroleum boom of the 1970s provided resources for major infrastructure programmes. However, centralised fiscal arrangements and dependence on oil revenues also made infrastructure closely linked to the distribution of state resources.

Thus, independence changed the political ownership and developmental purpose of infrastructure without completely removing inherited spatial inequalities and institutional practices. Although Nigeria expanded its infrastructure base, poor maintenance, uneven distribution and institutional weaknesses remained significant challenges.

Consequently, this historical experience demonstrates that infrastructure development involves more than constructing facilities. It also concerns how projects are financed, distributed, regulated, maintained and made accountable to citizens. A road may be constructed but deteriorate because of poor maintenance; a water project may be completed but fail to provide reliable services; and electricity infrastructure may exist without delivering affordable and dependable power.

The distinction is therefore important: infrastructure provision concerns what is built, while infrastructure governance concerns how it is planned, controlled, maintained and distributed. Nigeria's infrastructure challenge is consequently both developmental and institutional. Addressing it requires confronting historical inequalities while building more transparent, inclusive and locally responsive systems.

Furthermore, the provision of infrastructure is inherently political because decisions concerning its location, financing, access and maintenance determine the distribution of opportunities among citizens and regions. In Nigeria, infrastructure has consequently been influenced by developmental priorities as well as electoral politics, regional interests, patronage and elite competition. Major roads, airports, universities and hospitals may serve legitimate developmental

purposes while also becoming symbols of governmental performance.

As such the political involvement is not inherently undesirable because democratic governments must establish public priorities. The problem arises when infrastructure allocation is driven more by patronage and political influence than by transparent assessment of social need. Such practices can reinforce regional inequalities and weaken public accountability.

Therefore, from a decolonial perspective, the challenge involves three interconnected concerns: historical inequality, political discretion and technological dependency. Historical inequality reflects colonial spatial legacies; political discretion concerns the distribution of public resources without adequate accountability; while technological dependency increasingly relates to unequal access to data, knowledge, digital infrastructure and advanced technologies.

In view of that AI cannot automatically resolve these problems. If it relies on incomplete or historically biased data, or is deployed by institutions lacking transparency, it may reproduce existing inequalities while presenting them as objective technological decisions. The central question is therefore not simply whether AI can make infrastructure governance more efficient, but whose interests its efficiency serves, whose knowledge informs its decisions and who benefits from its outcomes.

Artificial Intelligence and the New Infrastructure Governance

The historical and political character of infrastructure governance provides the basis for examining AI as an instrument of transformation. By processing large datasets, identifying patterns, making predictions and supporting complex decisions, AI can shift infrastructure management from reactive administration towards predictive, preventive and evidence-based governance.

Predictive Maintenance

AI can analyse historical and real-time data to predict failures in roads, bridges, electricity systems, water pipelines and other infrastructure. This can reduce maintenance costs, improve safety and extend infrastructure lifespan. However, effective predictive systems require reliable data, connectivity, sensors and skilled personnel; without these, their benefits may remain concentrated in better-connected areas.

Intelligent Transport Systems

AI can improve traffic prediction, route optimisation, intelligent signalling, public transport scheduling and road-safety monitoring. Nigerian cities such as Lagos, Abuja, Kano, Port Harcourt and Ibadan could benefit from locally adapted systems. Such systems must recognise motorcycles, tricycles, informal buses and other mobility networks often excluded from foreign models. Local mobility knowledge should therefore inform intelligent transport design.

Electricity Management

AI can strengthen electricity-demand forecasting, grid optimisation, fault detection, load management and renewable-energy integration. It can also support solar mini-grids and decentralised energy systems in underserved communities. AI deployment should therefore address existing service deficits rather than reinforce infrastructure concentration.

Water Governance

AI can improve water-demand forecasting, leakage detection, flood prediction, water-quality monitoring and infrastructure maintenance. Combined with geographic information systems, it can identify vulnerable areas and prioritise interventions. These systems should complement community knowledge of seasonal water availability, traditional water sources and flood patterns rather than relying exclusively on formal datasets.

Urban Planning and Development

AI-assisted geographic information systems can analyse population growth, land-use change, housing demand, transport needs and environmental risks. Scenario modelling can also help planners assess proposed infrastructure. However, incomplete official data may make informal settlements invisible and deepen exclusion. Community participation must therefore remain central to AI-assisted urban planning.

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Public Procurement and Infrastructure Accountability

AI can examine procurement records for unusual pricing, repeated contract awards, abnormal bidding patterns and possible conflicts of interest. It can strengthen early detection and public oversight but cannot replace auditing, legal processes or human investigation. AI should support accountability, not substitute for institutional responsibility.

Citizen Participation and Service Delivery

Digital platforms can enable citizens to report damaged roads, failed water systems, electricity faults and other infrastructure problems. AI can classify complaints, identify recurring failures and help authorities prioritise responses. This can make citizens active participants in governance, provided that digital systems remain accessible to communities with limited connectivity and digital literacy.

The Decolonial Condition of AI

The application of AI to infrastructure raises a fundamental question: Whose AI, whose data and whose infrastructure? Global AI development is dominated by states and corporations with substantial computing capacity, capital and datasets. Excessive dependence on externally developed systems may reproduce older forms of technological dependency.

This concern reflects digital colonialism, whereby control over data, platforms, algorithms, digital infrastructure and technological standards becomes concentrated in powerful external institutions. For Nigeria, decolonising AI does not require technological isolation but the capacity to participate, negotiate, adapt and innovate on more equal terms.

This requires investment in local research, computing capacity, data governance, digital infrastructure, technical skills and indigenous innovation. Nigerian data should not simply become raw material for externally controlled technologies; ownership, privacy, representation, accessibility and public benefit must remain central to AI governance. Nigeria's National Artificial Intelligence Strategy provides a policy foundation through its emphasis on inclusive, human-centred and participatory AI development. The broader goal should be to move Nigeria from primarily consuming AI technologies towards becoming an active producer, adapter and governor of AI.

Humanities as the Ethical and Historical Compass of AI

AI is not merely a computational technology; it is also historical, cultural, ethical and political in nature. The humanities are therefore essential to ensuring that AI-enabled infrastructure governance, responds to human needs and social realities. History explains the origins of infrastructural inequalities, while philosophy and ethics address justice, dignity, privacy, transparency and responsibility. Anthropology and cultural studies brighten local practices and community relationships with infrastructure, while language studies can promote inclusion through Nigerian-language technologies. While Political science and sociology further examine power, participation, institutional control and accountability.

The humanities should therefore not be treated as peripheral to technological development. They constitute part of the intellectual and ethical infrastructure of responsible AI, directing innovation towards human dignity, social justice, inclusion and sustainable development.

Indigenous Knowledge and the Decolonisation of Infrastructure

Decolonising infrastructure governance requires recognising knowledge beyond official institutions and databases. Nigerian communities possess valuable knowledge of water systems, seasonal mobility, local materials, settlement patterns, environmental change and communal maintenance practices. A decolonial approach should not place indigenous knowledge above scientific knowledge but promote knowledge pluralism, allowing scientific, technical, historical and community knowledge to interact.

AI can support this process through community-based platforms where citizens report damaged roads, failed boreholes, electricity faults, blocked drainage and flood-prone areas. When combined with technical and administrative data, such information can improve responsiveness and transform citizens from passive beneficiaries into active participants in infrastructure governance.

From Centralised Administration to Participatory Intelligent Governance

The colonial administration was largely characterised by centralised authority and limited participation. Elements of this pattern persisted after independence, with infrastructure decisions often flowing from higher authorities to communities rather than emerging through sustained consultation.

AI and digital platforms can support more participatory governance by connecting citizens with local, state and federal institutions. An integrated infrastructure platform could combine geospatial and satellite data, infrastructure inventories, procurement records, maintenance reports, population statistics, environmental information, budgets and citizen feedback. AI could then identify infrastructure deficits, predict emerging needs and support investment priorities. However, technology alone cannot create meaningful participation. Intelligent governance must combine technology with transparency, responsiveness and accountability.

Infrastructure, Spatial Justice and Regional Inclusion

The decolonisation also requires addressing persistent spatial inequalities in the access to infrastructure, connectivity and public services. Historically concentrated infrastructure networks have contributed to uneven development, making spatial justice central to contemporary policy. ([15])

AI can support more equitable allocation through spatial analysis and an AI Infrastructure Equity Index incorporating population, poverty, road connectivity, electricity, water, health, education, broadband access and environmental vulnerability. Such a system would not eliminate political choice but could make investment decisions more transparent and evidence-based. The goal is not to replace politics with algorithms but to ensure that public decisions are increasingly informed by transparent evidence, social need and historical disadvantage.

Artificial Intelligence, Infrastructure and Sustainable Development

The value of Artificial Intelligence (AI) in infrastructure governance should ultimately be measured by its contribution to inclusive, resilient and sustainable development. Sustainable infrastructure must be economically viable, socially inclusive, environmentally responsible, technologically appropriate and maintainable. This aligns with Sustainable Development Goal 9, which emphasises quality, reliable, sustainable and resilient infrastructure with equitable access. AI can support these objectives through predictive modelling, energy optimisation, intelligent transport, water management, climate-risk assessment and renewable-energy integration. However, AI is not environmentally cost-free, as it requires electricity, data centres, computing facilities, cooling systems and hardware, all of which have environmental implications. Nigeria must therefore ensure that digitalisation does not automatically become synonymous with sustainability. Responsible AI governance should consider the entire technological lifecycle, including data production, energy use, procurement, maintenance, recycling and cybersecurity.

Major Challenges to AI-Enabled Decolonial Infrastructure Governance

The application of AI to infrastructure governance in Nigeria faces several structural challenges. The digital divide remains significant, as unequal access to connectivity may exclude rural and underserved communities from AI-enabled services. The electricity deficit further constrains computing, data centres and digital infrastructure. Poor data quality is another concern: incomplete, outdated or geographically unbalanced datasets can produce unreliable outcomes and reinforce algorithmic bias, particularly where historical inequalities are embedded in data.

Institutional capacity is equally important. Public agencies require skilled personnel capable of developing, interpreting, monitoring and challenging AI systems; otherwise, excessive dependence on foreign consultants and technology providers may deepen technological dependency. Cybersecurity and privacy are also critical as digitalised electricity, water, transportation and telecommunications systems become potential targets for cyberattacks and generate increasing volumes of citizen data. Finally, dependence on foreign platforms, proprietary algorithms and imported hardware may weaken technological sovereignty, while inadequate transparency and oversight could enable political manipulation or capture.

These challenges demonstrate that AI adoption requires more than technological investment. It demands reliable infrastructure, quality data, skilled personnel, strong institutions, ethical safeguards and meaningful citizen participation.

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Towards a Nigerian Decolonial AI-Infrastructure Framework

This paper proposes a Nigerian decolonial AI-infrastructure framework based on seven interconnected principles: historical consciousness, local knowledge, technological sovereignty, human-centred governance, spatial justice, transparency and sustainability.

Historical consciousness requires AI-based infrastructure planning to recognise the historical roots of spatial and socioeconomic inequalities rather than simply reproduce existing patterns. Local knowledge, including community experience, indigenous environmental knowledge and Nigerian languages, should complement technical and statistical data. Technological sovereignty requires investment in domestic AI research, computing, data infrastructure, software development and technical education, with international cooperation designed to strengthen rather than replace local capacity.

Human-centred governance requires AI to support rather than replace human judgement, democratic institutions and public accountability, particularly where decisions affect essential services. Spatial justice requires AI to identify infrastructure deficits and direct investment towards historically underserved communities rather than areas that merely possess better data or greater economic returns. Transparency demands that significant AI-assisted decisions be understandable, auditable and open to appropriate scrutiny. Finally, sustainability requires attention to environmental impact, energy efficiency, climate resilience, lifecycle costs and long-term maintenance.

Taken together, these principles represent a progression from colonial infrastructure, through postcolonial and digital infrastructure, towards intelligent and ultimately decolonial intelligent infrastructure. The defining issue is not technological sophistication alone, but who decides, whose knowledge counts, who controls technology and who benefits from infrastructure development. AI should therefore serve as an instrument for creating infrastructure that is inclusive, accountable, resilient and responsive to Nigerian realities.

3. Conclusion

The history of infrastructure governance in Nigeria demonstrates that infrastructure has never been politically or socially neutral. From precolonial systems of mobility, trade, water management and settlement to colonial railways, roads and ports, and from post-independence development programmes to contemporary digital systems, infrastructure has reflected changing relations of power, knowledge, economy and development. Colonial rule reorganised infrastructure primarily around administrative control and resource extraction, while independence introduced national development programmes without completely dismantling inherited spatial inequalities, institutional practices and technological dependence.

The emergence of Artificial Intelligence (AI) offers opportunities to address some of these challenges. Predictive maintenance, intelligent transport, energy management, water governance, urban planning, procurement analytics and citizen platforms can make infrastructure governance more efficient, transparent and responsive. However, AI is not inherently transformative. Biased or incomplete data can reproduce historical inequalities; foreign technologies can deepen technological dependence; and centralised digital systems can reproduce bureaucratic exclusion. Technology may therefore improve administrative efficiency without necessarily producing greater justice.

4. Policy Recommendations

The analysis demonstrates that AI can improve infrastructure governance in Nigeria only when supported by appropriate institutions, reliable infrastructure, local knowledge and ethical safeguards. Accordingly, the following measures are recommended:

The Federal Government should establish a National AI-Infrastructure Governance Framework linking the National Artificial Intelligence Strategy with national infrastructure planning, defining institutional responsibilities, deployment standards, data-governance requirements and coordination mechanisms among federal, state and local governments.

A National AI-Infrastructure Observatory should integrate reliable infrastructure data from different levels of government and, where appropriate, make non-sensitive information publicly accessible for planning, research and citizen oversight.

Regional AI-infrastructure innovation centres should be developed across Nigeria's geopolitical zones to create locally appropriate solutions for transportation, electricity, water, agriculture, environmental

management and urban development while strengthening domestic technical capacity.

Humanities and social sciences should be integrated into AI and infrastructure governance. Historians, philosophers, political scientists, sociologists, anthropologists and linguists should work alongside engineers and computer scientists to address questions of history, culture, ethics, power, justice and accountability.

Nigeria should invest in Nigerian-language AI to improve digital inclusion, public communication and citizen participation while supporting the preservation of linguistic and cultural knowledge.

Community-based infrastructure data platforms should enable citizens to report damaged roads, water failures, electricity problems and other deficiencies and monitor government responses, thereby strengthening participatory governance.

Nigeria should strengthen local data governance and technological sovereignty through clear rules on the ownership, storage, and processing, sharing and commercial use of public and community-generated data while protecting privacy and individual rights.

Governments should prioritise AI-supported predictive and preventive maintenance, using continuous infrastructure monitoring to identify failures before they become costly or dangerous.

Infrastructure equity mapping should guide public investment by identifying underserved communities and regions lacking roads, electricity, water, healthcare, education and telecommunications.

AI-assisted procurement analytics should be used to detect unusual pricing, repeated contract awards and suspicious bidding patterns, subject to legal, institutional and human oversight.

Nigeria should expand digital and physical infrastructure simultaneously, recognising that AI depends on reliable electricity, broadband, telecommunications, computing facilities and skilled personnel alongside roads, water and other essential infrastructure.

Government should establish safeguards against algorithmic discrimination, including standards for fairness, explainability, privacy, accountability, data protection, human oversight and independent auditing.

Nigeria should promote African technological cooperation through shared AI standards, research networks, datasets, digital infrastructure and capacity-building initiatives based on African realities.

Universities should develop interdisciplinary programmes combining AI, engineering, history, governance, ethics, environmental studies and development studies to produce professionals capable of addressing both the technical and human dimensions of infrastructure.

Infrastructure maintenance should become a national political priority. Government performance should be measured not simply by projects commissioned but by their functionality, accessibility, affordability, resilience and durability. AI can facilitate this transition through continuous monitoring and evidence-based maintenance.

Collectively, these measures point towards decolonial intelligent infrastructure governance, in which technology serves citizens rather than merely institutions or elites. The objective is to combine technological innovation with local knowledge, institutional accountability, spatial justice, environmental sustainability and democratic participation. Such an approach can help Nigeria move from being primarily a consumer of technological solutions towards becoming an active producer, adapter and governor of infrastructure technologies.

Finally, the central argument of this paper is that Nigeria needs AI with the humanities, not AI instead of the humanities. History provides the memory necessary to understand inherited inequalities; philosophy and ethics provide principles of justice, responsibility and human dignity; anthropology and cultural studies strengthen sensitivity to local realities; while political and social analysis addresses power, participation and accountability. Together, these perspectives can guide the responsible development and application of AI in Nigeria.

Nevertheless decolonisation should not be understood as rejecting foreign technology or international cooperation. Rather, it requires meaningful Nigerian ownership, agency and participation in the knowledge, data, institutions and technologies that shape infrastructure development. A decolonial approach should therefore strengthen local research, technical capacity and technological sovereignty while remaining open to beneficial global partnerships.

The goal should be a Nigerian model of intelligent infrastructure governance that is technologically advanced but historically conscious, digitally connected yet socially inclusive, data-driven yet human-centred, and globally engaged yet locally grounded. Such a model can enable AI to contribute not merely to the automation of infrastructure management but also to reducing historical inequalities, strengthening accountability, improving public services and advancing sustainable

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development.

Ultimately, the decolonisation of infrastructure governance is not fundamentally a technological project but a political, historical and human project. Its success will depend not simply on how intelligent Nigeria's technologies become, but on how wisely, ethically and inclusively they are governed. AI must remain an instrument of development—not its master.

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