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Sovereign AI Capacity in Africa: Beyond Technology Transfer Through Lessons from India

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Authors:

Remy Takang Arrey
CAPA, LLM, MSc, CAIO.
Lawyer & Certified Chief AI Officer

Executive Summary:

This paper examines how African nations can develop sovereign artificial intelligence (AI) capabilities instead of remaining passive consumers of foreign technologies. With Africa accounting for only 1% of global computing capacity, the continent faces a significant amount of challenges, but also has many opportunities to build AI systems specifically designed for African contexts. Drawing lessons from India's successful Digital Public Infrastructure (DPI) approach, the paper proposes a comprehensive framework for African AI sovereignty that expands beyond simple technology transfer and addresses infrastructure, human capacity, governance, and regional collaboration gaps.

The key insights include the importance of developing open, interoperable digital infrastructure as a foundation for AI applications; investing in human capacity through education and leadership development; creating governance frameworks that reflect African values and priorities; and fostering regional collaboration to achieve necessary scale. The paper also highlights India-Africa digital cooperation as a potential South-to-South partnership model that differs from traditional North-to-South technological relationships. Implementation priorities include infrastructure development, strategic data governance, expanded AI education, focused research on African challenges, and sustainable funding mechanisms.

Ultimately, this paper serves as a valuable starting point for policy discussions that will contribute to a definitive continental roadmap on AI governance. It explains why AI sovereignty matters for Africa, while acknowledging that further research and contextual adaptation will be necessary for effective implementation. By following this approach, African nations can ensure AI serves as a tool for transformation rather than reinforcing digital dependencies, ultimately engaging with global AI development from a position of strength and self-determination

1. Introduction

Africa is at a critical turning point in its technological journey. As artificial intelligence (AI) transforms economies worldwide, African nations have a choice: become passive consumers of foreign AI technologies, or develop sovereign AI capabilities that address their unique local challenges. Currently, Africa accounts for only 1% of global computing capacity, demonstrating a significant gap in the market that must be addressed (Mungai, 2025). According to projections from the African Development Bank, by 2030, AI could add $1.8 trillion to Africa's economy. This technology shows particular promise in transforming healthcare, manufacturing, engineering, education, and financial services by boosting productivity, innovation, and subsequent financial returns. Currently, we can already see this potential in action through Nigerian startups that are using AI to help farmers make increase yields through more analytical decision-making.

These AI applications are helping improve crop quality, increase the ratio of successful harvests, and reduce waste in agricultural processes across the continent (Aderibigbe, Ohenhen, Nwaobia, Gidiagba, & Ani, 2023). This paper explores how Africa can build sovereign AI capacity by looking beyond simple technology transfer models towards an approach that addresses infrastructure, human capacity, governance, and regional collaboration gaps. Drawing insights from India's Digital Public Infrastructure (DPI) approach, I will examine how Africa can chart its own path toward AI self-sufficiency while maintaining beneficial international partnerships. Additionally, I will make a case for why AI sovereignty matters for Africa and provide a framework for thinking about key elements required for building sovereign AI capacity. While recognizing that implementation will require deeper country-specific analysis and adaptations, this paper offers conceptual tools and comparative insights to guide such efforts broadly across the continent.

2. The Need for AI Sovereignty in Africa

AI sovereignty in this paper refers to a nation or region's ability to develop, deploy, and govern AI technologies according to local values, priorities, and needs. For Africa, achieving AI sovereignty is not merely about technological independence, but about ensuring that AI development serves African priorities rather than external interests.

The SAT Reporter (2025) argues that building sovereign AI infrastructure is "a strategic imperative for national development" in African countries. This sovereignty is crucial as AI increasingly influencing critical sectors including healthcare, agriculture, education, and governance. Without developing local capacity, African nations risk becoming perpetually dependent on external AI solutions that may not align with local contexts, values, or development priorities.

The current landscape shows a significant number of challenges. Beyond the computing capacity gap, Africa faces infrastructure limitations, skill shortages, and funding constraints. However, these challenges also present an opportunity to build AI systems from the ground up that are distinctly suited to African realities rather than importing models designed for different contexts.

[1] A 12 digit individual identification number issued by the Unique Identification Authority of India on behalf of the Government of India)

[2] Stands for Digital Infrastructure for Knowledge Sharing. It's a national platform for school education in India. It's mission is to create a revolutionary learning ecosystem that empowers students to thrive in the 21st century.

3. India's DPI Approach: A Model for Consideration

India's journey toward digital sovereignty offers valuable insights for Africa. Rather than simply importing technology, India developed its Digital Public Infrastructure (DPI) – a set of shared digital systems that enable essential functions across society (Government of India). This approach prioritized:

- **Open-source, interoperable foundations:** India built open digital platforms that allowed various applications to function together seamlessly.
- **Public-private partnerships:** The government established the necessary infrastructure while private entities built services on utilizing it.
- **Problem-first approach:** Solutions were developed to address specific local challenges rather than adopting technologies for their own sake.
- **Digital identity systems:** Aadhaar [1] , provided the foundation for numerous digital services.
- **Educational infrastructure:** Platforms like DIKSHA[2] support widespread digital literacy and skills development (Ministry of Education, Government of India).

India's approach demonstrates how a developing region can build digital sovereignty while still engaging with global technology ecosystems. The success of initiatives such as the Unified Payments Interface (UPI) shows how locally-developed digital infrastructure can outperform imported alternatives by better addressing local needs.

4. Building Leadership Capacity: The Human Element

Alone, technology cannot ensure AI sovereignty. Anderson (2025) emphasizes that developing AI leadership capacity through "education, training, and mentorship programs" is essential for Africa's AI future. Commonly, this human element is overlooked in technology transfer models that typically focus on hardware and software. Thus, leadership development must occur at multiple levels:

- **Technical expertise:** Expanding the pool of AI researchers, engineers, and data scientists who understand both AI technologies and local contexts.
- **Institutional leadership:** Building capacity in universities, research centers, and innovation hubs to sustain long-term AI development through local agents.
- **Policy leadership:** Developing expertise among policymakers and regulators who can create enabling environments for AI development.
- **Entrepreneurial leadership:** Supporting local entrepreneurs who can transform AI research into practical applications.

India's investments in leadership capacity through technical education and digital literacy has been crucial to its digital transformation. Africa can adapt similar approaches while addressing its unique educational landscape, and the human element. This might include specialized AI curricula, expanded scholarship programs, and international faculty exchanges.

5. Governance Frameworks: Balancing Innovation and Protection

Effective governance is essential for AI sovereignty. As the World Bank (2024) argues, Africa must move "from the margins to the center" in shaping AI governance, rather than simply adopting frameworks developed elsewhere.

The Institute for Global Change (2024) notes that governance approaches must "unlock a new era of transformation in Africa" by balancing innovation with appropriate safeguards. This requires governance frameworks that:

- **Reflect African values and priorities:** Include community-oriented approaches to data ownership and privacy.
- **Address African risk profiles:** Focus on issues most relevant to African contexts rather than primarily Western concerns.
- **Enable cross-border collaboration:** Support regional integration while respecting national sovereignty.
- **Protect against exploitation:** Ensure that data from African sources benefits African populations.

India's governance approach to its DPI offers valuable lessons in balancing central coordination with decentralized implementation. The establishment of dedicated agencies to oversee digital infrastructure development while allowing

6. Regional Collaboration: A Pan-African Approach

Building sovereign AI capacity across the continent requires collaboration across respective national boundaries. As the African Center for Economic Transformation (2024) emphasizes, "collaboration is critical for successful AI development in Africa." This collaboration must occur at multiple levels:

- **Resource pooling:** Sharing computational resources, datasets, and research facilities to achieve scale.
- **Knowledge sharing:** Exchanging expertise, best practices, and lessons learned across countries.
- **Harmonized regulations:** Developing consistent approaches to data governance, AI ethics, and cross-border data flows.
- **Collective bargaining:** Negotiating more favorable terms with international partners through coordinated action.

The emerging India-Africa digital cooperation model[3] offers interesting possibilities. CoinGeek (2023) reports that "India aims to boost Africa ties through digital cooperation," potentially offering a South-to-South partnership model that differs from the traditional North-to-South technology transfer apparatus. This relationship could help Africa benefit from India's DPI experience while adapting approaches to their own local contexts.

7. Implementation Pathways: From Vision to Reality

Moving from a concept to effective implementation requires concrete action across five critical priority areas to build meaningful AI sovereignty in Africa:

a. Infrastructure Development

Power Infrastructure: Develop distributed renewable energy solutions and energy-efficient data centers adapted to African climates.

Connectivity: Expand high-speed broadband through fiber optic networks, satellites, and last-mile solutions, while implementing policies to lower prohibitive data costs.

Computing Resources: Establish strategically located, high-performance computing centers accessible to researchers across multiple countries and develop shared computing resource models.

Physical Facilities: Build purpose-designed research centers with appropriate environmental considerations alongside secure data centers with necessary safeguards.

b. Data Strategy

Data Sovereignty: Establish legal frameworks that recognize both individual and community rights while developing data localization requirements for sensitive information.

Data Collection: Fund initiatives in priority sectors (i.e, healthcare, agriculture, and education) with ethical frameworks respecting different cultural contexts and addressing historical exploitation.

Data Management: Establish continent-wide data classification standards and develop secure, interoperable repositories accessible to researchers across different countries.

Data Sharing: Create frameworks for responsible sharing that protect privacy while enabling innovation and cross-border collaboration within African regions.

c. Education and Training

Basic Digital Literacy: Integrate digital literacy skills into primary and secondary curricula and develop mobile-first learning platforms accessible in low-connectivity environments.

Technical Education: Establish specialized AI and data science programs in universities with standardized curricula adaptable to local contexts.

Advanced Research Training: Develop doctoral programs with international faculty participation and create research exchange programs with established global AI centers.

Professional Development: Create continuing education for working professionals, reskilling programs for those whose jobs are eliminated by AI, and specialized training for policymakers, judges, and other key decision-makers.

[1] The India-Africa collaboration model is a partnership focused on mutually beneficial development and economic cooperation, emphasizing a consultative and equal approach. This partnership covers trade, investment, developmental projects, food security and agriculture, education, healthcare, tech and so on.

d. Research Priorities

Sector-Specific Applications: Develop AI systems for including but not limited to: healthcare diagnosis, small-scale farming, multilingual education, and financial inclusion.

Foundational Research: Document and advance natural language processing for Africa's diverse set of languages, improve computer vision systems that will perform well across diverse environments, and edge AI , designed to work well on devices with limited power, memory, or intern.

Ethical and Governance Research: Develop frameworks reflecting African communal values and appropriate governance models that balance innovation with protection.

Infrastructure Research: Investigate climate-appropriate computing solutions and energy-efficient AI approaches that are suitable for power-constrained settings.

e. Funding Mechanisms

Public Investment: Establish dedicated national AI development funds and create tax incentives for businesses investing in AI activities.

Private Capital: Create specialized venture capital funds focused on African AI startups and develop angel investor networks connecting diaspora resources with local innovation.

International Support: Negotiate favorable terms with development finance institutions and implement South-to-South cooperation models, particularly with emerging economies in other regions.

Innovative Financing: Explore digital service taxes earmarked for AI development and create impact investment structures tied to development priorities.

These five priority areas represent the critical foundations for meaningful AI sovereignty in Africa, and though this approach requires sustained investment, it offers the possibility of AI systems that genuinely serve African priorities rather than reinforcing existing dependencies.

8. Limitations and Future Research Directions

This paper acknowledges several limitations that should influence future research and policy development. While using India's DPI as a comparative framework is useful, further critical examination is needed regarding privacy concerns (WEF's Global Risks Report 2019), implementation challenges, and persistent digital divides (Anand, 2021). These challenges are apparent in the Indian model and are likely elements that could be transferable to Africa's more fragmented landscape. Also, the analysis would benefit from a deeper exploration of political economic challenges including rent-seeking behaviours, elite capture of benefits, shortsighted political incentives, and power dynamics between African governments and tech multinationals. Financial viability requires more detailed economic analysis through realistic infrastructure cost estimates, assessments of fiscal capacity, the balancing of short-term development needs with long-term AI investments, and a consideration of opportunity costs.

The paper relied on secondary sources, thereby, highlighting the need for primary research on sovereign AI capacity in Africa including detailed case studies of existing initiatives, stakeholder interviews, baseline capacity assessments, and systematic stakeholder mapping. Additional dimensions requiring exploration include gender and inclusion aspects of AI sovereignty, environmental impacts of infrastructure development, and security and geopolitical considerations.

These limitations emphasize that this paper should be viewed as a starting point for further investigation rather than a comprehensive blueprint, with future work focusing on context-specific implementation plans that address these cross-cutting issues.

9. Conclusion

Building sovereign AI capacity in Africa requires moving beyond simple technology transfer toward a comprehensive approach that addresses infrastructure, human capacity, governance, and regional collaboration. India's DPI experience offers valuable lessons in how developing regions can chart independent technological paths while engaging productively with global ecosystems.

By prioritizing open, interoperable systems, investing in human capacity, developing appropriate governance frameworks, and fostering regional collaboration, Africa can develop AI capabilities that genuinely serve its unique needs and priorities. This approach requires patience and sustained commitment while still offering the prospect of AI systems that contribute meaningfully to African development rather than reinforcing existing dependencies.

The journey toward AI sovereignty is not about isolation, but about ensuring that Africa engages with global AI development from a position of strength and self-determination. By learning from experiences like India's while charting a distinctly African path, the continent can ensure that AI serves as a tool for transformation rather than a mechanism for digital colonization.

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