
Three Steps to Unlock the Potential of AI in Africa

In the [first part](#) of this series, published in the journal *Science*, I laid out the three core challenges of power, connectivity, and data that stand in the way of Africa's artificial intelligence (AI) ambitions. Overly optimistic leapfrogging narratives cause us to either ignore these factors (for example, by excluding the persistent electricity problem in AI and digital strategies), or approach them with a troubling lack of granularity and nuance (for example, by using "digital infrastructure" as a byword for broadband access, which merely scratches the surface of AI needs).

These challenges are complex and interconnected, and further compounded by the diverse array of starting conditions, needs, and constraints unique to each African country. There are clearly no one-size-fits-all nor silver bullet prescriptions. Here, I outline three broadly applicable steps that African governments and their development partners can take to harness the potential of AI and minimize its risks on the continent.

1. Address the Root Problem of Affordable and Reliable Power

Energy poverty — not just the hundreds of millions of Africans lacking access to basic energy services, but also the [ubiquitous lack of affordable and reliable power](#) — is holding the continent back in every dimension of social and economic progress. AI is just one in a long list of sectors constrained by endemic energy poverty.

There is simply no 'leapfrogging' or bypassing the hard and costly work of increasing energy generation and building power grids fit for the 21st century. However, the power demands of AI and other digital industries opens up new opportunities to tackle the power problem. For example, data centers — massive facilities which house the physical equipment used for data storage, computer processing, networking, and other related systems — are ideal anchor customers that [provide numerous co-benefits to the power sector](#). This includes opening up new revenue streams for beleaguered electric utilities, driving improvements in power quality through their own investments and in partnership with utilities, and boosting demand for renewable generation. Notably, [while utilities in rich countries are struggling to meet the demand spike](#) from data centers particularly with increased deployment of AI applications, energy poor countries have more to gain by tapping into this demand center to shore up the entire system. Utilities and governments should thus do more to court these anchor digital technology customers, including through expedited power connections, aligned pricing, and joint infrastructure investments.

2. Enable (Instead of Directing) Technological Transformations

The era of sprawling and generic “digital transformation” strategies and related policy documents that are big on aspiration and light on specifics must end in Africa. Few governments have both the sweeping political authority and substantial resourcing to direct a technological revolution from the top down. African governments would then do better to focus on their role as enablers, rather than orchestrators, of technological progress, and start with ensuring that the necessary fundamentals are in place that create an enabling environment for other players in the ecosystem to thrive.

What are some of the steps to enabling technological transformations?

- **Ensure stable, transparent, and competitive markets that incentivize private sector investment.** This is exemplified by the major gains that the private sector has driven in deploying digital infrastructure on the continent — from cellular networks to fiber optic networks and the recent boom in data center construction — open and competitive markets plus growing local demand have fueled rapid growth in recent years. This will include clarifying and streamlining relevant regulations, standards, and legal procedures (e.g. environmental management, land leasing, power contracting and data governance in the case of data centers), as well transparent public procurement.
- **Collaborate to harmonize standards across the region, as proposed in the [African Union’s Data Policy Framework](#).** The AI and digital era brings with it new challenges with regards to standards and regulation. Current controversies around data localization and sovereignty — encompassing restrictions on cross-boundary data transfers and other legal requirements — are a case in point. The [current fragmented approach](#) being taken by several African countries could [impose additional hurdles, increase costs, and restrict access to cloud services](#).
- **Create demand by migrating public services to digital platforms, leading by example.** This is a growing trend on the continent, and indeed sixteen African countries — a diverse mix that includes Kenya, Gabon, Zambia, and Tunisia — were recently ranked as high performing in the United Nations’ latest [E-Government Development Index \(EGDI\)](#). It creates significant demand for digital infrastructure and services (for example, systems to manage the data generated from e-government activities and internet use by citizens accessing these services) catalyzing investment into the sector.
- **Ensure widespread availability of robust public data sets and repositories,** a necessary input for operationalizing context-specific AI applications and more. Currently, African countries have the [lowest statistical capacity globally](#), the ability to produce reliable statistics that track trends for a wide range of indicators covering demographics, economy, meteorology, energy, health, and many others. Innovative

methods such as satellite data, sensor technologies, and even AI-generated data sets are increasingly important data sources, but traditional institutions tasked with collecting, processing, publishing and updating public data sets are still critical. These underappreciated national statistical offices often languish in the background and are chronically underfunded. African governments must protect more funding for this work, such as [Mali's recent creation of a dedicated trust fund](#) within the treasury to support core statistical activities such as censuses and surveys.

- **Make direct investments into AI research and development.** Some donor-led initiatives are currently funneling initial investments into African AI research, such as the [Canadian-Swedish AI for Development initiative](#) and a [new collaboration between the UK, Canada and Gates Foundation](#), but African governments and other development partners should step up as well. South Africa is one of the regional outliers in its longstanding investments into this space — the government [established one of Africa's major supercomputer facilities over a decade and a half ago](#) and funds AI research through programs such as the [South African Research Chairs Initiative](#). But even modest investments can make a big difference. The Nigerian government recently launched the [Nigeria Artificial Intelligence Research Scheme](#), which awards N5,000,000 (around \$3000) in grant funding to Nigerian AI researchers or startups. These are small sums by global standards, but can go a long way for cash-strapped African researchers who are experimenting with AI applications, enough to purchase a high performance laptop and training data sets, for example.
- **Ground vision-setting AI strategies and policy roadmaps in local contexts and specific actions, not the usual policy boilerplate.** For example, recent reviews of national AI policies globally by the [OECD](#) and the [World Bank](#) showed that while governments take different approaches, a common feature is to outline specific actions in a few priority areas. This includes indicating specific R&D allocations, introducing new schemes to support SMEs and AI startups, expanding public data sets, or announcing initiatives targeting locally-relevant priority sectors or themes (e.g. chip manufacturing in China, or local language resources in Denmark). Many African countries haven't created AI-specific strategies yet, and thus have a chance to learn from these examples and avoid the pitfalls of the performative and ineffectual strategies that predate the AI moment.

3. Reduce Barriers to Entry for Local AI Players

There are many smart and motivated researchers and entrepreneurs who are keen to explore local use cases for AI on the continent. [Deep Learning Indaba](#), an annual gathering of Africa's AI research community that has taken place since 2017, embodies these growing bright spots. Tech majors, global academic institutions, as well as African governments and their funding partners need to do more to help local players get a stronger foothold in the AI space.

This will include expanding access to free and low-cost cloud computing resources. Platforms such as [Google Colab](#) and [Amazon Sagemaker](#) provide free processor and storage access that are helpful for testing and experimentation, but are only viable for small-scale projects. More should be done to expand these options for users in African and other developing countries, who face significant cost barriers. Similarly, equipment donations from tech companies and research institutions in rich countries can help give African research centers a headstart on high performance computing.

Complementing government efforts to shore up local public data sets, international players can also play a role in supporting improved data access. Many big global data sets are still paywalled. Efforts to push international organizations such as the International Energy Association to open up their data sets have seen [stilted progress](#). Advancing the [FAIR data principles](#) and the broader open science movement within academic publishing is also needed to give African researchers access to primary data, particularly since a significant share of peer-reviewed research about Africa is published by experts based outside the continent ([63% of studies in African energy transition research](#), for example).

Finally, more needs to be done to help Africans gain the necessary skills to be competitive in the AI space. Currently, there are few AI-focused postgraduate programs on the continent, and these are largely concentrated in South Africa. Regional programs such as the [African Masters of Machine Intelligence program](#) run by the African Institute for Mathematical Sciences at its Pan-African campuses with support from tech companies and global expert instructors is an interesting model for pooling together resources across the region. More bootcamps and flexible short courses, such as those run by Nigeria's [Data Science Network](#), are also needed. Research collaborations between global and African researchers are another important mechanism for knowledge and skills transfer in this area.

The AI future is full of both great potential and uncertainty. Industrial revolutions have come and gone, leaving many African countries on the sidelines. History is poised to repeat itself if we don't act now to build strong foundations that will enable us to be active agents rather than passive spectators in the next phase of global transformation. The details will vary from country by country, but the general principles stand: Africa needs less buzz and more of the basics — affordable and reliable power, governments who act strategically as enablers rather than ineffective orchestrators, and a constellation of actors across the public and private sectors working to reduce barriers to entry for ambitious Africans with big AI dreams.