The State of AI in Africa - A Policy Brief

Strathmore University

Centre for Intellectual Property and Information Technology Law

Contributions

This work was aided by,

Introduction

From Cairo to Cape Town, Africans and African governments have embraced AI technologies. The adopted tools and technologies are as diverse as Africa, and abundant in agriculture, health, fintech, and education. African governments like Zambia have used AI technologies to fight electoral disinformation and misinformation; those in Libya have used AI to deploy autonomous weapon systems; in Zimbabwe, they have strengthened their surveillance systems using biometrics; and in Kenya, Ghana, and Togo, among others, the same technology has been used to develop microlending apps, to distribute social funds, and other initiatives. These exciting developments are not without risk or limits. This policy brief discusses the four main challenges in the current AI development ecosystem and pipeline and provides key recommendations that could address these challenges. The policy brief is based on findings from a survey on the current AI landscape in Africa, detailed in a State of Artificial Intelligence in Africa 2023 report.

The full report can be accessed via this link: https://cipit.strathmore.edu/artificial-intelligence/#1684756067281-dafd0a75-19eb

AI and Data: Privacy and Surveillance Concerns

AI technologies require vast amounts of data to predict patterns and automate systems. This endless need for data may lead to the collection of vast amounts of data without any explicit purpose and unethical and, at times, even illegal practices to gather and process data. These actions proliferate illegal and malicious practices such as hacking and cyber-attacks, make people and their data vulnerable to unlawful processing and use, and lead to privacy breaches. The privacy and surveillance concerns around how AI technology data is gathered affect governments and the private sector. Governments in Zimbabwe, Tanzania, Angola, and Mozambique have deployed surveillance technologies, in some cases with biometric and facial recognition capabilities.[1] These measures were often justified by citing national security concerns, often without providing adequate mitigation measures against privacy violation concerns. Private sector actors such as Google and Facebook have amassed vast amounts of data with and without the consent of their users. Internet Service Providers track and monitor their customers' online and offline activities, and often, this data is packaged and sold in data markets.[2] In addition, malicious actors intentionally attack companies to illegally access private information to extort companies, exploit the personal information of individuals listed in the database, or sell this information on the dark web.[3]

To have a healthy AI ecosystem and a clean data pipeline, governments, tech companies, and the private sector should adopt essential mitigation measures to fight the perils of unwarned surveillance and illegal data use.

- First, governments must balance surveillance for national security purposes with protecting citizens' privacy. These measures should be legal, necessary, and proportionate.
- Second, governments that have data protection laws should implement and enforce these laws, and governments without data protection and privacy legislation should enact these laws.

[1] Allen Munoriyarwa and Admire Mare, Digital Surveillance in South Africa (Pulgrave Macmillan 2022)

[2] Joe Robinson, Internet Surveillance and how to keep your activity private (23 March 2023) < https://www.privacyaffairs.com/internet-surveillance/> accessed 8 May 2023

[3] Patrick Howell O'Neill, Facebook Says 50,000 users were targeted by cyber mercenary firms in 2021 (16 December 2021) < https://www.technologyreview.com/2021/12/16/1042652/facebook-says-50000-users-were-targeted-by-cyber-mercenary-firms-in-2021/> accessed 8 May 2023

- Third, any actors who gather data to develop AI or other technologies should only collect data through the explicit consent of the data subjects.
- Finally, any actor that collects data should have privacy policies free of legal jargon and with adequate and verifiable information about what sort of data they collect, how they plan to use the data they gather and information about how the data will be discarded.

AI and Innovation: Infrastructure, Capacity, and Data Requirements

Even though African tech companies are developing exciting and innovative AI technologies, they face immense l challenges. A thriving AI ecosystem is infrastructure, data, and capacity intensive. AI technologies require vast data and sophisticated infrastructure that can help collect data, annotate, segment, transcribe, and make data ready for computation and AI use. Due to the low internet connectivity rate, the lack of mobile phones, and the analog nature of business and transactions, critical data necessary for predictive models is lacking in Africa. [4]Most African tech companies still struggle to develop AI technologies, including lacking resources for scaling; having to build on open-data architectures, digitizing operations, and fostering an agile culture for innovation. These companies are stuck in a vicious

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cycle: they need data to develop and grow their infrastructure, and they need the infrastructure to collect and analyze data. Computing infrastructure and data is the foundation of AI innovation and adoption, and it would be difficult to grow one without the others. The current alternative to the lack of critical data is to depend on 'foreign' or non-African data to develop the infrastructure. This approach is concerning as the resultant datasets often lack basic context about the realities of the data subjects. Lastly, capacity is crucial to make data and infrastructure abundantly available. Capacity, both in terms of practical and theoretical skills and experiences of understanding, developing, deploying, and using AI technologies, is currently limited across the continent and needs urgent intervention to develop the necessary skills.

To develop a thriving AI ecosystem, governments, tech companies, and the private sector need to play critical roles.
- First African governments must digitalize critical sectors such as agriculture, health, water resources, and other sectors to make this data accessible to develop AI technologies.
- Governments should facilitate legal, consensual, contextual, and accurate data collection to fill the massive data chasm in the continent across many sectors.
- Local tech companies should develop foundational infrastructures, robust data management culture, and peer learning.
- Higher learning institutions are pivotal in closing the skill and capacity gap across the continent. They also have a key role in developing key research, informing policy and are uniquely positioned to respond to Africa's critical AI needs.
- Lastly, if adequately sensitized, policymakers can positively influence the development of a healthy and thriving AI ecosystem. Practical and actionable tools such as an AI Handbook and practitioners' guide for policymakers

[4]UNESCO Launches the findings of the Artificial Intelligence Needs Assessment Survey in Africa.' (UNESCO, 5 May 2023), Chinasa T Okolo, Kehinde Aruleba and George Obaido, 'Responsible AI in Africa—Challenges and Opportunities ' in Kutoma Wakunuma, Damian Okaibedi Eke and Simisola Akintoye (eds), Responsible AI in Africa: Challenges and Opportunities (Palgrave Macmillan 2023).,

would enable policymakers to catch up to the AI discourse.

Practical AI: AI Use and Impact in Selected Sectors

African governments and local tech companies have innovatively used AI technologies to address health, agriculture, legal, and creative development. Countries such as South Africa have used this technology to understand the retention of health workers in the public sector[5], while Kenya is home to various e-health start-ups.[6] In Ghana, they use deep learning to automate radiology, while in Egypt, they use AI for triage and tele-nursing services.[7] From technologies that assist in mitigating climate change threats and diagnosing crop diseases to the appropriate use of fertilizers, water, and pesticides, African farmers have benefited from AI technologies.[8] Like health and the agricultural sectors, African law firms and start-ups have developed AI tools to build legal tech products and services. These legal tech products and services comprise 3% of the legal market share. Law firms in Kenya, Egypt, and Nigeria are leading with legal tech innovation.[9] Lastly, African creatives are increasingly using AI technologies for their artistic creations.[10] In some cases, creatives have used AI models to generate images from text descriptions or samples.

[5]Moyo S, Doan, T.N,, Yun, J.A. et al, Application of machine learning models in predicting length of stay among healthcare workers in underserved communities in South Africa [2018] Hum Resour Health 16, 68

[6]Illara Health last accessed 16th May 2023

[7]Minohealth last accessed 16th May 2023 & Egyptian ehealth startup , 7Keema to expand across Africa via quasi franchising model last accessed 16th May 2023

[8]An overview of AI technologies in African Agriculture last accessed 16th May 2023 & Nuru AI expansion : supporting farmers to diagnose crop diseases last accessed 16th May 2023; & Kenya AI based Agritech , Apollo Agriculture last accessed 16th May 2023

[9]Egypt: Pioneers In Integrating Artificial Intelligence to Enhance The Efficiency of Lawyers and Tax Professionals [2023] last accessed 11th May 2023.

[10]How AI is Changing the Future of Creative Enterprise last accessed 11th May 2023. https://www.forbes.com/sites/forbestechcouncil/2023/03/27/how-ai-is-changing-the-future-of-creative-enterprise/?sh=45a04fe65e6

These innovative use of AI technology in different sectors often has the potential to drastically change reactive archaic systems to proactive and agile systems. However, to benefit from and develop these AI technologies, governments, private sectors, technologies, and others must play a critical role.

Therefore:
- First, governments should roll out more context-specific tools and technologies so citizens can receive better government services.
- Second, governments should incentivize private sector actors and stakeholders, especially in health and agriculture, to innovate new technologies and make them accessible to their respective communities.

Responsible AI: Policies, Laws, and Frameworks

Rapid advancements in AI in almost every sector have opened up new opportunities and frontiers worldwide. However, these advancements will be futile if they are not supported with regulations to help mitigate against these risks. Currently, most African countries develop and regulate

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AI technologies through data protection laws, national AI strategies, or dedicated institutions. For instance, about 35 African countries regulate these technologies through data protection laws. At the same time, Egypt, Mauritius, and Rwanda

have developed National AI Strategies, [11]and others like Nigeria have instituted the first Africa National Center for AI and Robotics.

National AI strategies are better at marrying the development and regulations of AI together. For instance, Egypt's national AI strategies promote adopting, implementing, and using AI in different sectors, including government services, national development, and human capacity building. Mauritius, following Egypt, proposes a similar initiative in its National AI strategy and goes further to deploy and use AI technologies in manufacturing, health, biotechnology, maritime, transportation, business processes, and citizen and government services. Continentally, at least 46 African countries have adopted the UNESCO recommendation on the Ethics of Artificial Intelligence[12]; however, many of these countries are yet to consider their respective local contexts and contextualize these recommendations. Africa is yet to roll out AI technologies in almost every sector fully. Although this delay has its own challenges, it gives Africa and other countries a unique advantage to innovate while regulating.

To fully grasp these opportunities and develop a responsible AI ecosystem, countries must consider these issues:

- Firstly, governments must be willing to develop regulations, policies, and frameworks that push for innovation and regulation in tandem.
- Secondly, national policies and regulatory frameworks must ensure that emerging technologies benefit humanity and are contextualized to local contexts.
- Lastly, African developers must be incentivized, supported, and encouraged to develop an 'African AI' that responds to the needs and context of Africa.

Conclusion

Many African governments and citizens are slowly starting to experiment with AI technologies. From using AI to fight disinformation to creating art and music using AI, Africans are taking part in the AI revolution. However, there's a significant difference between Africa and the rest of the world regarding using AI. If the African and African governments do not improve their AI-related infrastructure, develop their data ecosystem, expand the talent pool related to AI, and, most importantly, develop and contextualize responsible AI regulations, policies, and laws. In that case, they will continue to be consumers of tools and technologies developed without their consent, content, contribution, and knowledge.

[11]Egypt National AI Strategy (Ministry of Communications and Information Technology, July 2021) accessed 5 May 2023. https://mcit.gov.eg/Upcont/Documents/Publications_672021000_Egypt-National-AI-Strategy-English.pdf; Mauritius Artificial Intelligence Strategy (2018) https://treasury.govmu.org/Documents/Strategies/Mauritius%20AI%20Strategy.pdf; Rwanda's National AI Policy https://www.minict.gov.rw/index.php?eID=dumpFile&t=f&f=67550&token=6195a53203e197ef-a47592f40ff4aaf24579640e

[12]193 Countries Adopt First-ever Global Agreement on the Ethics of Artificial Intelligence.' (UN News, 25 November 2021) <https://news.un.org/en/story/2021/11/1106612