

PROPELLING AFRICA'S ECONOMY:

THE ROLE OF ARTIFICIAL INTELLIGENCE (AI)



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TECH HIVE

ADVISORY

About Tech Hive™

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Contributors

Favour Borokini & Oluwabeminiyi Ojedokun

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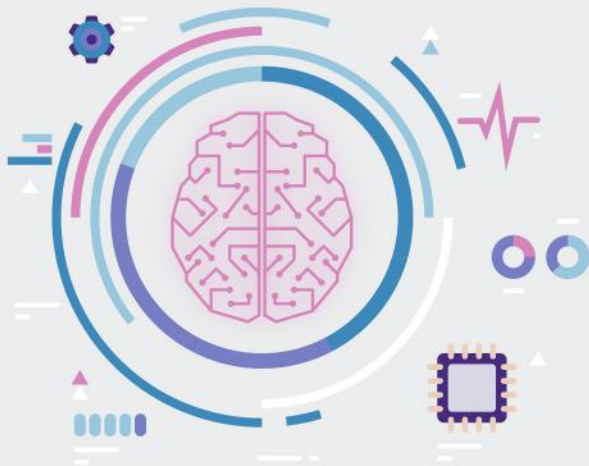
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HIGHLIGHTS

Artificial Intelligence (AI), a term often connected with robotics, cloud computing, data analytics and so on, has been considered by many to be a driving force behind the Fourth Industrial Revolution (4IR), thus begging the question if Africa will be a part of this revolution or be left behind. Conversations around the use of Artificial Intelligence (AI) have for the most part existed outside of Africa and many African nations are yet to fully implement the necessary infrastructure needed to facilitate its adoption due to a variety of factors. The International Development Research Centre (IDRC) AI Readiness Index 2020 recently ranked Sub-Saharan Africa lowest along with Latin America, the Caribbean, and South and Central Asia¹.

In recent years, however, Africa has seen an increased interest in discussions surrounding AI, largely driven by private individuals in the tech sector. However daunting it may be to many African nations, AI might just be that innovative tool needed to meet the expectations of growth in the African community as it offers a plethora of solutions to the many complex challenges plaguing most African nations. It is, however, doubly important to take note of the novel risks and challenges which could significantly affect development and growth positively or negatively² posed by Artificial Intelligence. The absence of regulation in the region could make it difficult to properly oversee its uses and impact, hence the need for regulation.



¹ International Research Development Centre (2020). Government AI Readiness Index 2020. Malvern: Oxford Insights. www.oxfordinsights.com/s/AI-Readiness-Report.pdf

² Besaw, C., & Filitz, J. (2019, 16 January). AI & Global Governance: AI in Africa is a Double-Edged Sword. Centre for Policy Research, United Nations University. www.cpr.unu.edu/ai-in-africa-is-a-double-edged-sword



1. Tunisia

In Tunisia, the government has approved the creation of a Task Force to oversee the National AI Strategy project and a Steering Committee to devise a methodology and an action plan to produce the strategy³.

2. Egypt

The Egyptian government launched its national AI Strategy which is meant to be implemented within three to five years in 2019. The strategy rests on four pillars: AI for Government, AI for Development, Capacity Building, and International Relations.

The Egyptian government also formed the National Council for Artificial Intelligence, chaired by the Minister of Communications and Information Technology, as a partnership between governmental institutions, prominent academics and practitioners from leading businesses in the field of AI and its main objective is to unite national efforts, and develop Egypt's AI strategy and various AI-related applications⁴.

Egypt is also interested in setting up a new Egyptian University of Information Technology, as well as two new AI colleges and eight computer and information faculties⁵. According to the Government AI Readiness Index, Egypt soared up 34 places from last year's 111th to 56th position this year.

3. Kenya

The Government of Kenya announced a Blockchain & Artificial Intelligence task force in January 2018 to create a five-year strategy on national use of emerging technologies. The task force which was unveiled⁶ in February of the same year consists of 11 total members from academia and industry.

Areas of interest for the task force include the application of these technologies to public service delivery, cybersecurity, financial inclusion, and election processes. The task force will also provide recommendations for the government in the next five years with key milestones slated for 2027 and 2032 and situate the strategy in the areas of financial inclusion, cybersecurity, land titling, election process, single digital identity, and overall public service delivery.

4. Rwanda

Although Rwanda does not have a National AI strategy in place at the moment, plans are underway through partnerships and collaborations with foreign and local experts⁷. Reports state that there are ongoing policy developments to cater for AI being supervised by the Ministry of ICT and Innovation, in partnership with RURA, the Rwanda Information Society Authority (RISA), and all relevant stakeholders from the public and private sectors and civil society⁸.

In September 2018, AI officially entered the university curriculum, thanks to a master's degree launched by the Senegalese expert Moustapha Cissé, head of Google's AI research centre in Ghana, and by the African Institute of Mathematical Sciences (AIMS) in Kigali⁹.

³ National Agency for Scientific Research Promotion. (2018). National AI Strategy: Unlocking Tunisia's capabilities potential. www.jaist.ac.jp/~bao/AI/OtherAIstrategies/National%20AI%20Strategy%20Unlocking%20Tunisia%E2%80%99s%20capabilities%20potential%20%E2%80%93%20Agence%20Nationale%20de%20la%20Promotion%20de%20la%20Recherche%20scientifique.pdf

⁴ www.mcit.gov.eg/en/Artificial_Intelligence

⁵ Wight, B. (2019, 9 September). Egypt sets its sights on artificial intelligence. CIO. www.cio.com/article/3435110/egypt-sets-its-sights-on-artificial-intelligence

⁶ (2018, 28 February). Kenya Govt unveils 11 Member Blockchain & AI Taskforce headed by Bitange Ndemo. The Keryan Wall Street. www.keryanwallstreet.com/kerya-govt-unveils-11-member-blockchain-ai-taskforce-headed-by-bitange-ndemo

⁷ (2020, 31 August). The Development of Rwanda's National Artificial Intelligence Policy. The Future Society. www.thefuturesociety.org/2020/08/31/development-of-rwandas-national-artificial-intelligence-policy

⁸ Habumuremyi, E. (2019). Rwanda. Global Information Society Watch. www.giswatch.org/node/6186

⁹ www.unesco.org/courier/2019-2/rwanda-miracle

5. Mauritius

Ranked 45th globally in the Government AI Readiness Index, after Egypt, Mauritius is the only other African country with a national AI strategy. The Mauritius Artificial Intelligence Strategy is a report released in 2018 by the Working Group on AI, one of three working groups reporting to a steering committee, set up under the Chairmanship of the Secretary to the Cabinet¹⁰. A unique selling point of the strategy is its focus as an island nation on the Ocean Economy.

6. Nigeria

In 2018, the Nigerian Minister for Science and Technology announced that the Nigerian government had approved a new agency for robotics and artificial intelligence (AI),¹¹ the National Agency for Research in Robotics and Artificial Intelligence (NARRAI).¹²

However, this year, on the 13th of November, the Minister of Communications and Digital Economy, Dr Isa Pantami, officially commissioned the National Centre for Artificial Intelligence and Robotics.¹³ It is unclear if this centre would be under the control of the NARRAI, as no mention was made of the agency.



Use Cases of AI In Africa

The use of AI is currently gaining traction in Africa and if well leveraged, it could positively transform Africa's economy. A step in this direction was made by Google last year when the tech giant opened an AI research lab in Ghana, the first on the continent¹⁴. The aim is to provide researchers an avenue and appropriate tools to develop problem solving innovations that would directly address the many challenges in Africa.

According to Moustapha Cisse¹⁵, lead of the Google AI Research Lab in Ghana, "AI is a critical tool used today to accelerate all sorts of sciences in physics, chemistry and engineering. But most of the people working and advancing the science and developing it in the field are based mostly in Western countries. It's important that such an important field [can address] a diversity of the problems that the world faces today, and Africa is accurately represented."

AI has the potential to provide a host of benefits to

sectors such as health care, agriculture, education, finance, art and security. Already, we can note a few examples that demonstrate the benefits of AI. In the health care sector, AI is being used in situations where human knowledge is inadequate. For instance, to diagnose various kinds of health challenges at early stages especially when it comes to maternal and child health. In Nigeria, the startup, Ubenwa¹⁶, uses AI to detect asphyxia in babies through the analysis of a baby's cry¹⁷. AI would also expand the accessibility of healthcare while improving the quality of healthcare provided.

In the banking industry, the use of chatbots on the websites of many financial institutions equally demonstrate the positive use of AI. This is particularly helpful in situations where human resources are inadequate and insufficient. There is also the issue of enhanced security as well as increased access to financial services by all and sundry.

¹⁰ Working Group on AI. (2018). Mauritius Artificial Intelligence Strategy. [www.cib.govmu.org/Documents/Strategies/Mauritius%20AI%20Strategy%20\(7\).pdf](http://www.cib.govmu.org/Documents/Strategies/Mauritius%20AI%20Strategy%20(7).pdf) 11

¹¹ Alajemba, N., & James, C. (2018, 6 August). Nigeria To Set Up New Agency For Robotics And Artificial Intelligence. *IT Edge News*.ng. www.itedge news.ng/2018/08/06/nigeria-set-new-agency-robotics-artificial-intelligence

¹² Shogbola, O. (2018, 1 August). FG TO ESTABLISH TWO NEW AGENCIES. Federal Ministry of Science and Technology. www.scienceandtech.gov.ng/2018/08/01/fg-to-establish-two-new-agencies

¹³ (2020, 13 November). Nigeria gets Artificial Intelligence, Robotics Centre. *The Guardian*. www.guardianng/news/nigeria-gets-artificial-intelligence-robotics-centre

¹⁴ Kionguyi, K. (2019, Apr. 17). 'Ghana: Google Opens Its First Artificial intelligence Lab On the Continent.' Available at: <https://allafrica.com/stories/201904180055.html> Accessed 11 November, 2020.

¹⁵ Caboz, J. (2019, Apr. 15). 'Google's African scientists are teaching machines to solve problems on the continent.' Available at: <https://businessinsider.co.za/european-ai-dont-understand-ai-so-google-is-going-to-start-building-thinking-machines-in-ghana-2019-4> Accessed 11 November, 2020.

¹⁶ Visit www.ubenwa.ai

¹⁷ Mbamalu, S. (2017, Dec. 19). 'Nigerian innovators create Ubenwa, an app that detects asphyxia in babies.' Available at: <https://thisisafrika.me/africans-rising/nigeria-ubenwa-app/> Accessed: 11 November, 2020.

Not excluding the agricultural sector, AI is being harnessed to leverage genomic precision in livestock production models which would enable the selection of good genetic characteristics at an early stage¹⁸. The research centre in Ghana is also working on an application that would allow farmers to identify sick plants from just a photo¹⁹. Basically, AI is being used to ensure efficiency and effectiveness in farming which would eventually lead to increased yields.

Challenges to the Use of AI

There are several challenges hampering the growth and development of AI in Africa. To start off, many countries in Africa lack a governance framework to effectively implement the use of AI in its various sectors. This is not surprising, as the use and development of AI has mostly occurred in North America, Europe, and Asia.

There are also deficits in infrastructure, digital and otherwise, hampering the growth and development of AI as well as a lack of technical know-how/talent deficits needed to understand the complexities of AI use. The cost implications for the adoption of AI alone, can be crippling for African nations, many of which are already in debt.

The absence of reliable data sources in the continent also affects the effectiveness of AI applications to the very issues it is expected to solve. In the absence of data or worse, with malicious or unreliable data, it is difficult to adequately measure and define scope and therefore the solutions needed for targeted use cases²⁰. The absence of local data itself could therefore promote a reliance on foreign data sets, thereby hampering the ability of AI to provide locally relevant and useful information and contributing to a phenomenon described as “algorithmic colonisation”²¹. In addition, since AI algorithms are so reliant on data to make predictions and provide solutions, existing data sets, many of which are exclusionary to women and other marginalised groups, through algorithmic bias produce harmful results²² inimical to socio-economic growth and development worsening existing biases and in some cases, importing new ones.

A lack of public trust in the general deployment of emerging technologies, of which AI is most prominent, based on socio-cultural biases and stereotypes, also presents challenges to the mass adoption of AI. Further compounding this problem, are recorded instances of gender-based violence against women²³ and racial minorities²⁴.

¹⁸ Travaly, Y. and Muvunyi, K. (2020, January 13). “The future is intelligent: harnessing the potential of artificial intelligence in Africa.” Available at: <https://brookings.edu/blog/africa-in-focus/2020/01/13/the-future-is-intelligent-harnessing-the-potential-of-artificial-intelligence-in-africa/> Accessed: 11 November, 2020.

¹⁹ Caboz, J. (2019, Apr. 15). “Google’s African scientists are teaching machines to solve problems on the continent.” Op. cit.

²⁰ Sey A., & Ahmed, S. (2020). An African perspective on gender and artificial intelligence needs African data and research. Cape Town: Research ICT Africa. www.researchictafrica.net/wp-content/uploads/2020/10/Gender-AI-Policy-Brief.pdf

²¹ Birhane, A. (2020). Algorithmic Colonization of Africa. SCRIPed, 17(2).

www.script-ed.org/article/algorithmic-colonization-of-africa/

²² Prabhu, V. U., & Birhane, A. (2020). Large image datasets: A pyrrhic win for computer vision?. arXiv preprint arXiv:2006.16923. www.arxiv.org/pdf/2006.16923

²³ Deva, S. (2020, 12 April). Addressing the gender bias in artificial intelligence and automation. Open Global Rights, www.openglobalrights.org/addressing-gender-bias-in-artificial-intelligence-and-automation

²⁴ Buranyi, S. (2017, 8 August). Rise of the racist robots – how AI is learning all our worst impulses. The Guardian. www.theguardian.com/inequality/2017/aug/08/rise-of-the-racist-robots-how-ai-is-learning-all-our-worst-impulses



Recommendations on the Best Model for Regulation

Inter-border, Cross-border, Collaborative Action

The most effective form of regulation would take into cognisance the inter-border, cross-border peculiarities of technological innovations such as AI. Our recommendation is for States to build on existing regional conventions and agreements such as the African Union Convention on Cyber Security and Personal Data Protection²⁵ and The Digital Transformation Strategy for Africa (2020-2030)²⁶. These efforts could significantly boost legislative effectiveness and assist enforcement necessary to mitigate the misuse of AI by bad actors²⁷.

Partnerships between stakeholders in academia, as well as public and private sectors are necessary for wholesome, holistic policy making. These collaborations would facilitate the development of locally relevant policies that take community idiosyncrasies into cognisance.

AI-Specific Legislations

In addition to regional approaches to AI development and regulation, it is also important to consider the development of subsidiary legislation targeting specific challenges posed by AI usage including but not limited to algorithmic bias²⁸ and data processing.

Other Recommendations

To benefit from the use of AI however, efforts must be put in place to address certain structural challenges that currently exist to prevent the growth of AI in Africa. The most essential requirement would be for governments to implement clear frameworks that encourage and guide the adoption of AI. There is a need for reforms to accommodate AI. This would be the first and foremost step in addressing the structural challenges faced by the continent.

The next logical step would be training of individuals for them to develop the necessary skills. This would be achieved through reforms in education from the earliest possible level and investing in technology research and development.

Also, plans must be put in place to ensure the local applications of AI in order to maximise its full potential for African nations.

Conclusion

It is not hard to imagine what Africa's future would look like if AI is fully harnessed. One thing that the adoption of AI would put an end to are the terms, "developing" or "third-world" countries. It is worthy of note that a few forward-thinking governments and startups in Africa are already active in promoting the growth of AI and this can only be commended and encouraged.

²⁵ African Union. (2011). African Union Convention on Cyber Security and Personal Data Protection. www.au.int/en/treaties/african-union-convention-cyber-security-and-personal-data-protection

²⁶ African Union. (2020). The Digital Transformation Strategy for Africa (2020-2030). www.au.int/en/documents/20200518/digital-transformation-strategy-africa-2020-2030

²⁷ Besaw, C., & Filitz, J. (2019). Op. cit.

²⁸ Algorithmic Accountability Act of 2019, H.R.2231, 116th Cong. (2019) [www.congress.gov/bills/116/congress/house-bill/2231/all-info#:~:text=Introduced%20in%20House%20\(04%2F10%2F2019\)&text=This%20bill%20requires%20specified%20commercial,artificial%20intelligence%20or%20machine%20learning.](https://www.congress.gov/bills/116/congress/house-bill/2231/all-info#:~:text=Introduced%20in%20House%20(04%2F10%2F2019)&text=This%20bill%20requires%20specified%20commercial,artificial%20intelligence%20or%20machine%20learning.)