



The Future of Artificial Intelligence in Africa: Risks and Opportunities

By Claudio Butticè



Artificial Intelligence (AI) is going to be the most revolutionary technology that humanity ever experienced, and many developed countries have already started implementing it in its earliest forms. The African continent is lagging behind, and many challenges, including inadequate knowledge, infrastructure, and research capacities, must be overcome to harness its potential fully. If Africa won't find a solution to harness AI's full potential quickly enough, the digital divide will be exacerbated, further widening the gap between this continent and the rest of the world.

However, things are not so simple. Social media platforms have already been exploited by many ruthless governments to distort reality and spy on people, and it's no secret that China is among those countries behind these dystopian scenarios. Many African countries are increasingly reliant on Beijing's Big Brother technologies to monitor their citizens' communication, and the Chinese giants are, in turn, using data drawn from these partnerships to feed their AI.

Why are the most unethical uses of AI used, such as mass surveillance and social control, being exported to developing countries? What does the future of AI technology hold for Africans? Is there any way to keep up with the new global technology race without being involved in the current rivalries between China, Russia, Europe, and the United States?

The full range of opportunities opened by AI is simply immense. The latest advancements in machine learning (ML)-based technologies are affecting literally every field of human knowledge and every aspect of human society. AI is so revolutionary that it is [a disruptive and sustaining technology at the same time](#), with applications ranging from architecture to education, security, data collection, agriculture, industry, communication, and [even the world's economy](#).

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One of the most controversial uses of AI and ML is augmented analytics to understand human behaviour. Drawing from the immense amount of big data collected in the last few years by data analysts across the world, modern AI development is being used to improve all kinds of enterprise needs - from marketing to sales, customer services and human resources (HR). The new predictive models of human behaviour are becoming more refined, and new sciences, such as social physics, are emerging to help us understand an entire society.

Keeping up with the current AI revolution is critical for Africa because this technology has the potential to have as much global impact as the discovery of America, the invention of gunpowder, or the Industrial Revolution. AI will be able to influence human society so deeply that it will open up a unique opportunity to improve the lives of wealthy and poor people equally. On the other hand, failing to adopt it as quickly as possible may exacerbate global inequalities even more, forcing Africa to lose any ground it may have gained over the rest of the world. Moreover, rushing its development may expose many countries to the interests of unscrupulous giant corporations (and foreign governments) who may want to expropriate their digital sovereignty.

The current state of AI in Africa

Healthy development of AI in Africa is a central topic of discussion today. A central point brought up during the latest [UNESCO Forum on Artificial Intelligence in Africa](#) that took place in Morocco on 12 and 13 December 2018 was that the proper use of local human resources is the best approach to harness the full potential of AI. Start-ups across the world are identical in one aspect: they're always driven forward by the enthusiasm of the people who founded them. This energetic ecosystem of AI start-ups is just as lively in Africa as in other richer countries and represents a powerful force that can make the difference.

[There are many examples](#), such as Clevva, a Stellenbosch-based company founded in 2011 that implemented AI in agriculture. Their virtual advisor helps sales and technical consultants by providing them with fundamental information about the products that are used to make optimised and accurate decisions. Their platform is so efficient and flexible that it was later used even by financial services and petroleum companies. Or Hubs.ng, a Nigerian company that recently launched an AI-based digital assistant and customer care agent named Emily that earned the start-up [the 2018 Digital Africa Start-Pitch prize](#).

The enormous potential of the thriving African digital environment has attracted the attention of many venture capitalists, who invested \$560 million in 2017 in this continent. And the future seems to be even brighter for AI in Africa, as none other than the biggest technology giant of the world - Google - decided to make substantial investments. After supporting and advising more than 60 start-ups through the Launchpad Accelerator Africa project, Google pushed forward its AI efforts in Africa by [opening its first AI laboratory in Ghana's capital city, Accra](#). According to the Senegalese lead

research scientist Moustapha Cisse, its goal is to provide local developers with the necessary means needed to build products that can address the many problems faced by African countries every day. For example, its algorithm deployed on phones to diagnose crop diseases will be published as an open-source code for everybody to access.

Things are, however, rarely that simple, and AI is evolving at an amazingly fast pace. Many challenges still need to be overcome if Africa wants to keep pace with the rest of the world.

Barriers against the implementation of AI in Africa

Just like its entire technology infrastructure, the development of AI in Africa is still in a very immature stage. Much like a valuable crop, AI requires a suitable environment to eventually bear fruit and become productive. Extremely inconsistent IT infrastructure represents a major challenge that needs to be addressed by various African governments, mostly because AI requires robust networks, immense computing power, and stable connections.

And diversities do matter for AI - quite a lot, in fact. If the data fed to AI is full of bias, the machines will see that bias as "normality" and react accordingly. The vast majority of ML experts are in North America, Europe, and Asia and they're inadvertently building discrimination inside their products.

Machines have their own way of learning. Machine Learning (ML) can be compared to a child - it needs to be "educated" in the appropriate way before it can grow into a fully functional adult. However, deep learning models must be fed with lots of data to train them, a resource that is currently scarce in Africa. Other than lacking the raw amount of big data that the other highly developed countries collected in the last few years, even the data that is currently available is often largely irrelevant. Much like Europe, the African continent is a mixed bag of complex and varied cultures, languages, and identities, with substantial diversities between the political and legal frameworks that characterise each country and region.

And diversities do matter for AI - quite a lot, in fact. If the data fed to AI is full of bias, the machines will see that bias as "normality" and react accordingly. The vast majority of ML experts are in North America, Europe, and Asia and they're inadvertently building discrimination inside their products. [A tragically comic but outrageous episode occurred in 2015](#) when the facial recognition software of the Google Photos app tagged images of black people as "gorillas" because that was the data the algorithm has been fed with. The samples used to gather data must be diverse enough to provide an accurate representation of reality. But the humans and the experts that gather this data must be diverse as well - or else they will inevitably transfer their bias inside the algorithms.

African engineers and AI researchers are very limited in number, mostly because the education system is often insufficient to provide African talent with the necessary degree of specialisation. The most brilliant minds have no choice but to complete their academic studies overseas and are, therefore, lost to competition in the never-ending technology race. There's no network of African institutes of artificial intelligence available to coordinate the efforts made by the various African countries, which still need to depend on external aid. This overreliance on help from outside is a serious liability, and, once again, represents a vulnerability that endangers the ability of most African governments to retain their sovereignty.

A unique opportunity or the theatre of an upcoming digital war?

AI is neither good nor bad. It can be used to improve the lives of people or to manipulate their

opinions and create “fake news” – it depends on how it is used. Nevertheless, the rapid evolution of AI is not devoid of dangers. Undeniably, some of the global players saw in this emerging technology an opportunity to encroach on human rights. ([We already talked a lot about the serious threat](#) represented by those external forces which are currently influencing Internet freedom in Africa.)

China is planning to become the world leader in the field of AI and ML, and it is fueling its plans for domination by using the developing world as a giant laboratory. Many African governments are strictly dependent on Chinese companies for their telecom and digital services, which are used to improve the newest surveillance technologies and facial-recognition algorithms.

Companies like Google say that they have ensured that all privacy concerns are addressed and that their algorithms are transparent enough, but it’s still too early to know if they will keep their word. In the meantime, the power of AI has already been used more or less secretly by governments and organisations to influence society and to push their agenda.

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But digital sovereignty is not a problem that affects Africa alone. After Edward Snowden blew the whistle for the first time back in 2013, many industrialised countries felt that the privacy of their citizens was endangered by the unstoppable power of tech behemoths. Digital paranoia is spreading everywhere. In Europe, in November 2018, [the French government announced](#) that it will ditch Google as the default search engine for their devices in favour of the privacy-focused Qwant. The United States, Australia, and New Zealand have all banned Huawei 5G gear on the grounds that the Chinese equipment poses a threat to their national security. With so many global interests at stake, every choice made by African governments about the future (or the present) of AI technologies is inevitably going to have many repercussions – even from a strictly political point of view.

And despite efforts made by continental forces in Europe and North America to set ethical guidelines for the implementation of AI, the threat represented by its most nefarious uses is always present. Africa must establish a solid legal and ethical framework to ensure that the digital journey of AI leads to positive outcomes.

Governments have the responsibility to harness the power of AI and ML to help communities grow and prosper. This technology should never be used to spy or prey on citizens, or to enforce the position of dystopic tyrants; it must always be employed to serve the good of humanity first and foremost.

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