

# The Fourth Industrial Revolution is Africa's to Lose

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*Two Kenyans “sheltering” under a drone used to deliver drugs and medicine in Rwanda. Africa must not lose in the 4th industrial revolution. Photo by XN Iraki*

On Wednesday 14th March, 2018 Africa Centre for Economic Transformation (ACET), a think tank based in Ghana was in Nairobi with a simple mission. To” undertake a study to better understand what the Fourth Industrial Revolution (4IR) means for the future of jobs and especially youth employment in Africa.” The study is on behalf of Africa development bank (AfDB).

The key areas of focus in 4IR include machine learning/artificial intelligence/robotics. Machines can now do jobs that were previously the domain of human beings. Machines can learn and adopt. Think of computers that can play games or driverless cars than keep tabs on the road conditions including traffic jams. Many people would be hesitant get into a driverless car, but that the future reality. Don’t we use “driverless” lifts in high rise buildings?

The second area is Internet of Things (IoT). Devices from our fridges to other gadgets we use every day are connected to the net. This allows unprecedented controls and communications whose social economic effects are yet to be fully understood. Think of picking items in a supermarket, without going through the cashier, money is debited directly from your bank account or Mpesa. In a continent where human interaction really matters, this is an interesting area to watch.

Third is Data mining technologies/data science: ACET (2018) notes that “The capture of vast amounts of data, when combined with powerful computing capabilities and AI algorithms, generate unprecedented amounts of insights.” Statistics is enjoying a renaissance. The patterns and trends within data are business opportunities. Think of airlines booking systems, hotels reservations, and even tax returns or customer information in banks. African governments holds vast amount of data. Will it become a public good or will it be commercialized by entrepreneurs?

Fourth is 3D printing. Just design a product and print it. From prosthetics to artificial teeth. Going directly from designing to physical product, promises the revival of cottage industry and could help developing countries particularly in Africa avoid the smoke stacks. What will happen to the factories, some that have stood for hundreds of years? As Vimal Shah (2017), the boss of BIDCO, a leading industrial firm in Kenya once joked, we could in future start printing pizzas. Have African policymakers factored realities like 3D printing in their long term plans?

The fifth area is Blockchain or trust technologies: ACET (2018) notes, “Blockchain lets people who may have no confidence in each other collaborate without having to go through a neutral central authority. Blockchain is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.” What will happen to lawyers, bankers, brokerage firms and lots of government officials? No wonder Blockchains are seen as the silver bullet against corruption. Blockchains will be the deathblow to power as we know it. Once in place, lots of power wielders and brokers in both private and public sector will lose their power. No stamps, no signatures, no come tomorrow for services. Blockchains could finally set Africa free from the yoke of nepotism into a growth trajectory.

The fifth area, which ACET left out, is the convergence of physical and biological systems. Do you call artificial hand that could be controlled by the brains just like the normal hand? Imagine such a robot? One hot area for those in school to think about is biophysics or bioengineering. We are accepting a simple fact, nature is far better than us, we better learn from it. The professions of the future will be more multidisciplinary. Have universities and school systems factored that in curriculum designs?

If you recall, the World Economic Forum Annual Meeting 2016, was held under the theme “Mastering the Fourth Industrial Revolution” (Schwab, 2016), the founder of World Economic Forum noted “4IR is characterized by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human.” It seems as usual, Africa is catching up with the rest of the world.

Now that we know what entails the 4IR, how shall Africa, a continent where joblessness is a huge problem, particularly among the youth react to the new reality? There three possible scenarios.

One, Africa can watch as the rest of the world moves on. We did that with the first three industrial revolutions. The first was based on mechanization of textile mills and steam engine, the second on mass productions pioneered by Henry Ford and the third was on digitization of manufacturing. I encountered the second and third revolutions by use of manual lathes and later numerically controlled lathe machines in a technical school. We are yet to come to term with earlier revolutions. The basics of an engine have remained the same, but we still can’t make cars. We prefer to show off our new cars oblivious of the jobs we could create if we made cars here. No wonder Obama made sure General Motors was saved after he became the president (Bigman, 2013). We still do not mass produce anything in Africa.

Two, we can do what we did in telecommunications, leapfrog. Most Kenyans never had fixed telephones in their house. We got directly into mobile phones which we have exploited better than western countries that came up with the mobile phone. Think of Mpesa and other services uniquely Kenyans that we get through our phones. This would be our preferred route.

The nature of social economic set up makes it easier to adopt the 4IR. Since we do not like learning, we can let machines do it for us. Blockchains can slay our most popular dragon, corruption. 3D would make our homes new industrial centers, with the biggest bottleneck being the design. All the data lying within the government and private sector, including churches could be mined for patterns and trends. Maybe we could eventually explain why we behave the way we do.

Three, we can move up the value chain so that we can become the providers of these technologies to the rest of the world. Japan did that with cars while India did the same with pharmaceuticals and software. Why can't Kenya become the leader in artificial intelligence? We only need our brains, unlike steel mills that demand huge capital outlay. Why can we be leaders in designing blockchains? The most important input in 4IR is brain, which lowers barrier to entry for professionals and new firms. The beauty about this approach is that instead of worrying over job losses we shall create more. Think of the jobs created by computers, yet we feared lots of jobs would be lost. After fearing computers as job killers, they spawned a new area of study, computer science and millions of jobs.

One big question is whether Africa is prepared for 4IR. Anecdotal evidence seems to suggest we are not. Are our schools ready for 4IR? I used to wonder why my maths, physics and chemistry teachers in high school were Indians. By focusing on sciences, India prepared itself to become the pharmacy of the world and center for software development. What of Africa?

To what extent have African education systems espoused the 4IR? To what extent has government policies embraced 4IR? Are we ready for the socio-psychological disruption from 4IR? Yet, we have not even fathomed the effects of social media on our society.

Africa has been losing other Industrial revolutions; the 4IR is ours to lose. We can be even be smarter, start the 5IR and reap all the benefits like other pioneers.

## **On The Fringes of 4IR: Drones in Rwanda**

The 6th Africa Humanitarian Logistics Conference took place in Nairobi from 14-15 March 2018. The conference shared ideas among humanitarian supply chain managers, logisticians, academia and other stakeholders. Among the key players in the conference was World Food Program (WFP), Kuehne Foundation and University of Nairobi.

Expert Speakers included Dr Jon Lenchner, Chief Scientist for IBM Research Africa, Prof. Gyongyi Kovacs from Hanken in Finland, Prof. Nico Vandaele from KU Leuven, Prof. Alan McKinnon from Kuehne Logistics University among others.

One major attraction in this conference was the use of modern technology in a very sensitive area, delivery of drugs and medicine in Rwanda. Yaniv Gelnik who works for Zipline demonstrated how a drone can deliver two kilograms of essential drugs to remote areas using a miniature parachute then return to base. The drone for this type of work resembles a plane, and is launched like a plane instead of vertical landing and takeoff like helicopters or drones popular in photo shooting.

Yaniv plans to get into the Kenyan market soon. In his discussion, one thing came out clearly. The regulatory regime is a big factor in adoption of new technologies including 4IR. Rwanda was quick to see the potential of drones. Yaniv, who imports the drone technology from California, thinks Rwanda is even ahead of USA in the commercial use of drones. USA is way ahead in the military use.

The use of drones to deliver medicine to remote areas in Rwanda can be a good template in how we can exploit the 4IR technologies. The government first must create an enabling environment, where private investors find it easier to exploit their talents and new technologies. Think of future uses of drones in other areas including in e-commerce.

Two, we do not need to reinvent the wheel. The drones have been used successfully in others areas e.g. the military. Why not adopt the 4IR technologies which have been used successfully elsewhere?

Someone is using artificial intelligence somewhere, with China becoming a power in this area. Someone must be data mining, with some software for that available for free. The same applies to blockchains and other facets of 4IR.

We also must build local capacity to use the technology. This will reduce resistance once the technology recipients see direct benefits like job creation. The capacity should be beyond the hand on training. It should extend to integrating new technologies into our curriculum right from primary to university. Can I find Artificial intelligence or blockchains in school textbooks or students only hear about them on TV or radio?

The young minds are more agile to exploit the new technologies and create new ones. How can they create 5IR when they are not conversant with 4IR? Unlike political revolutions that are started by emotions, industrial revolutions are started by hard thinking, investment in research and development and forward thinking. More importantly is that to reap from 4IR or 5IR we must believe in possibilities and ourselves. Who thought one day we could deliver drugs or medicine by drones or send money by phone? This project in Rwanda shows clearly Africa can reap from 4IR and 5IR, what it will contain.

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## References

- Bigman, D. (2013). How General Motors Was Really Saved: The Untold True Story Of The Most Important Bankruptcy In U.S. History. *Forbes*, November 18, 2013. <https://www.forbes.com/sites/danbigman/2013/10/30/how-general-motors-was-really-saved-the-untold-true-story-of-the-most-important-bankruptcy-in-u-s-history/#3b95f8a7eea2>, Retrieved on September 17, 2018.
- Boateng, G. (2018). The challenging problem of labour and youth education: A wake up call for Africa, Africa Centre for Economic (ACET), Transformation(ACET), Accra , Ghana.
- Gelnik, Y. (2018). Exhibition, The 6th Africa Humanitarian Logistics Conference, Nairobi , Kenya, 14-15 March 2018.
- Shah, V. (2017). Keynote speech at Africa international Management Conference (AIBUMA), Nairobi, Kenya.
- Schwab, K. (2016). Address to World Economic Forum Annual Meeting, Davos, Switzerland.