

## A BEGINNER'S GUIDE TO THE FOURTH INDUSTRIAL REVOLUTION IN AFRICA:

# Concepts and Debates

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## What is a revolution?

**A** revolution is change that happens over a length of time. This type of change is driven by human beings. It starts as an idea in the minds of a few, and then spreads out into the minds of more people so that it gains momentum to force a change in the world. A political revolution is often forced through protests or policies, where the majority of the affected people drive this change in their desired direction. An industrial revolution is a change in economic power, where the main driver of the economy is changed from a certain technological sector to another.

## Industrial Revolutions' main fields

The various industrial revolutions have always depended on changes in the main technological fields. During the first industrial revolution, the mechanical engineering field was the main driver of the revolution. During the second industrial revolution, the field of electrical engineering was the main driver (in collaboration with mechanical). During the third industrial revolution, computers were the main drivers (in collaboration with

mechanical and electrical engineering). In today's fourth industrial revolution, the internet and AI are the main drivers (in collaboration with mechanical, electrical and computers). Each industrial revolution then contains elements of the previous ones and thus builds upon them.

## What influences these changes or industrial revolutions that happen over time

I believe that these changes are natural. The various industrial revolutions are a result of natural changes, or in scientific terms, these changes are called evolution. The source of innovative ideas are a type of intellectual evolution as technological advancements or developments are part of leaps in thought. Every revolution is then part of the evolutionary process. Evolution is not just about natural changes over millennia but it is also about change in human behavior over a shorter period of time that can be witnessed by people over the course of their lifespan. This can be illustrated with current ideas of generations: we have the silent generation (born 1945 and before), Baby Boomers (born 1946 - 1964), Generation X (born 1965 - 1976), Millennials (born 1977 - 1995) and Generation Z

(born in and after 1996). All of these generations have a different view of life, they approach life in different ways and that is why people of certain generations usually think that people belonging to a different generations are 'weird'. This kind of change in human behaviors is influenced by nature (evolution), and it first starts in the mind (where every type of change is initiated). So by simple definition, a revolution can be seen as basically the evolution of consciousness.

### Adapting to a revolution (change)

Charles Darwin's theory of the survival of the fittest still applies to revolutions in industrial ages; he defined it this way: "It is not the strongest species that survives, nor the most intelligent, but the ones most responsive to change" (Vergata, 1994). We have witnessed the rise of various nations who have been able to take advantage of or adapt to the changes in technology that each industrial revolution brought about, in order to become the powerful nations in this world. Africa has largely been behind with these developments, and that is partly why Africans have been spectators rather than leaders for so many years. Africa's history of subjugation has led to this predicament. It started with the international slave trade, when Europeans used more technologically advanced means of transportation and weaponry to subjugate and then transport millions of Africans across the world as slaves. Had they found Africa with similar weapons, Africans' international enslavement would have been difficult to establish in the way it was done. If Africa had had more advanced technologies for the mining of minerals, it would have been a wealthier continent as it is a fact that Europeans found Africans already mining for minerals (Mapungubwe's golden rhinoceros being the evidence) (Moffet, 2014) when they arrived on the continent. China is one of the leading nations in terms of technology globally today, and they have been investing and loaning funds to many of African countries. Some analysts see this as a strategy that China is using to recolonize Africa, just in a friendlier way (Kinyondo, 2019). This begs the question of what the African continent would look like with its own technological innovations.

### Shaping Africa for the 4IR

African leaders today have to be careful when it comes to working with other nations in the wake of

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the 4IR - that is, if they want to lead the continent into a better position, where it could be a globally competitive continent and have no other nations colonizing it again in any form. This new industrial revolution can work to Africa's advantage, since Africans are now exposed to technological information and education which they were deprived of during the past industrial revolutions. To achieve this, African leaders must give more attention and invest more in technologies and innovations in Africa. An example of such technological innovation is 'Libby' - a robot that was introduced at the University of Pretoria's library in South Africa. South African developed, 'Libby,' is used to help students with library usage such as to finding books or accessing content. The fact is that while this robot has put some jobs at risk as there is no longer a need to have a human do this kind of work manually, there are other benefits to be had here. If the robot is developed and manufactured locally, it would create more jobs for the manufacturing and maintenance of the robot. This means that while one job sector shrinks, another grows. The method of relying mostly on locally produced innovations will be the beginning of Africa's self-reliance, which is one of Pan-Africanist ideologies' important goals.

One of the other disadvantages of relying on technologies from elsewhere is that we are not sure if we are going to be 'friends' with these nations forever. Machines and AI in particular can be controlled from afar, so what will happen if we are no longer on good terms with whatever country a machine came from? Is it not a risk that the behavior of these machines can be remotely controlled and they become our enemies? We have already witnessed this kind of interaction happening between America and China with the Huawei scandal. This type of trade war could have a huge impact on everyday life if the scale

expands.

Since we know that connection to the internet is based on transnational undersea cables running from continent to continent, what could potentially happen with the main servers based in, and owned by, other countries? If the countries in charge of the servers decide to stop Africa from using the internet due to political reason, what would happen? Imagine life without the internet... how will we communicate since we have already adapted to this kind of communication?

### Decolonizing technology

African leaders need to start giving more attention and invest more funds in local innovators working on new technologies relevant to this 4IR. I am talking about prioritizing investing in local research and innovation in the technological field. We are already educating people in this new age of technology where some institutions, like the University of Johannesburg, have placed 4IR technologies at the forefront of education. This innovative approach is part of a long history of calls for the decolonization of knowledge from the African continent. Both Robert Sobukwe and Steve Biko called for self-reliant economies in Africa. This idea is not limited to land politics, but can also be achieved through a different way of using the 4IR to drive African economies into a better state. In fact, Africa is in a better position to turn things around than ever before by investing time, money and energy, however limited, in locally produced technologies. The problem with the many analysts in this 4IR age is that they are talking about the impact this new industrial age will have on our lives, and not how Africans can use this new age to our advantage to take Africa forward and make it a better continent.

### But what can be done in using 4IR to improve Africa?

Africa is an economically poor continent and young innovators need to work at any job that they can find in order to merely eat, leaving little time for invention. Most African governments, South Africa included, are investing more money in conventional businesses than innovations, but conventional business models like the ubiquitous tender system in South Africa do not create real jobs. Many of the people running these

tendering companies are not problem solvers and are more interested in gaining material wealth for themselves than actually creating value for the people that they are meant to serve; in addition, this system has proven to be filled with corruption as the Zondo commission has exposed and therefore this sort of business model does not really solve Africa's economic problems. Another problem that delays Africa's progress in general is corruption, but that is a topic for another day. Centers like the Innovation Hub in South Africa that are aimed at supporting innovation among youth, but they do so at a very slow pace and with very minimal funding. They initially cover the funding needed to pilot an idea, but do nothing to support the innovators' personal expenses, even basic ones, at that time. In reality, personal expenses are of extreme importance in poorer countries where most young people do not have surplus income from their families to support them through this process, regardless of the veracity of their ideas. This is a short sighted approach as innovation has long term potential to uplift people and countries out of poverty.

In technology leading countries like China, it takes a shorter time to take an invention from idea stage to commercialization stage, while in Africa it takes longer and that is only if the innovator does not lose hope and give up (Rees, 2018). This results in a lag for African countries in general when it comes to developments. African governments should give more support to innovators if they really want to take this continent forward and, they must do so at this early stage of the 4IR. This new industrial revolution is taking place at an exponential speed as compared to the previous revolutions, where a waste of more time will only lead Africa to becoming worse off as change will not wait for it. The only constant thing that remains unchanged in this world is change itself. Nothing remains the same forever. What we need to do as Africans is to adapt to this change as early as possible, and then drive it in our own direction for our own benefit. ■

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