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KEYNOTE ADDRESS AT MISTRA'S LEAP4.0 CONVENTION, 29 SEPT. 2020:

UTOPIA OR DYSTOPIA

ROBOTS, WIZARDS, UNICORNS AND OTHER HEROES OR VILLAINS OF THE 4IR

By Rapelang Rabana

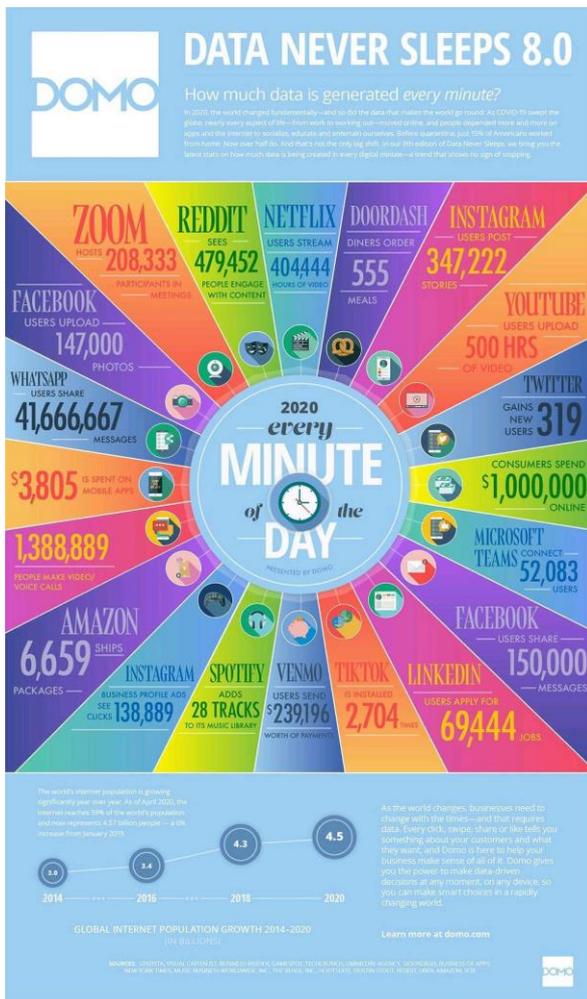
29 September 2020



In most literature on the Fourth Industrial Revolution, human agency is relegated to the margins- displaced by cyber-physical technologies which, at times, take on mythical forms. Are we doomed to live at the mercy of machines? Are we looking at technological change in the best way?

Let us start unpacking what we mean by the Fourth Industrial Revolution. The first revolution was driven by water and steam and new manufacturing processes; the second used electric power to drive scale, and the third

revolution was characterised by electronics and information technology to automate production. A lot of the technology we refer to as part of the 4IR, like automation, is actually part of the 3rd one. The 4th Industrial Revolution, according to the World Economic Forum, 'blurs the lines between physical, digital and biological', brings unprecedented speed to breakthroughs and delivers unlimited access to information. It includes technologies like Augmented Reality, Virtual Reality, 3D printing, nanotechnology and implanting chips into our bodies.



How did we get here? Why is it happening now? Change has been happening for a long time. What is different about this time? On a technological level, the upsurge in computing power, supported by dramatic reductions in the cost of computer components, ushered in a time where smart devices are now so affordable that there are more mobile phones than people on the planet. The number of devices, from cameras and sensors, is exploding and so is the amount of data we produce.

Every minute we are generating extraordinary amounts of data: almost 42 million WhatsApp messages are sent, over 500 000 hours of video are uploaded to YouTube and over 200 000 people are in Zoom meetings. And that is before we even consider the data generated through the devices of the Internet of Things.

There have also been transformative changes in how we share knowledge and expertise. We have come a long way from sharing knowledge orally, to using script, then print and now electronic mediums. This transformation has democratised access to information and knowledge with each step, which affects so much of our work and



lives. Macro-economic dynamics create a greater necessity for new solutions that are more efficient and more affordable. The emergence of the African demographic dividend, with mass urbanisation and a growing middle class, generates significant demand for services and products. And now, with the advent of COVID-19, the pressure for rapid change and the adaptability to cope in this new world has only heightened. These social, economic and political dynamics mean that life can't remain business as usual.

But can the 4IR help us? Unfortunately, when most of us think about AI, it isn't positive. We think of all the sci-fi movies we ever watched, with scary predictions about the end of the human race or humanity losing control to machines. We think of a mysterious black box taking in all the data points we don't even know about and making decisions we don't understand or that are biased. My challenge to that notion is that human intelligence and decision-making itself is — and always has been — a black box.

We have lived so much of our lives without understanding how decisions around us are made. The mind of a doctor making a diagnosis is also a black box. They use their learned and tacit knowledge, combined with a 'gut feel' — hence doctors don't always reach the same conclusion. Nor do judges or business leaders. AI is no less transparent than the way in which people have always worked — and in many cases it could represent an improvement. Yes, machines and software can be prone to biases. But with AI, we can set ethical boundaries. We are in a better position to curate the mental models and decision making process, ensure that teams are diverse and that data points used to train models are representative of the people they serve. And we can keep improving a model.

What happens when people hold inherent biases? You can't look inside the mind of a human, and so we battle to do anything about it. We have even seen biased, narrow-minded people rise to become presidents, at which point biases go on to become national policy. In many ways we have already seen disaster, so shouldn't we be more open to explore new ways? Viv Ming said so aptly, 'people treat AI in the same way they treat stories of demons and angels and fairies.' Now is not the time to think in black and white. Our world is just too complex. We are still at the stage of narrow AI — computers can take in a complex set of instructions and spit out an output. We are a long way from getting wiped out by our own digital baby. Machines are great at going through and storing masses of data, complex computation, pattern recognition, curation of information and finding links. What machines can't do is to decide what to do, what to focus on, where and how to get inputs or exercise judgement where all options entail some loss. Machines can't consider all stakeholders and make decisions for a broader society, because a machine doesn't understand what it's doing or attach meaning to its work. We can benefit from significant gains if we shift from this either/or thinking -Utopia or Dystopia - and consider how we combine machine and computer power to do all things better.



My concern with this either/or thinking, this utopia or dystopia thinking, is that it assumes that our starting point is utopia and that we are deciding between a future utopia or dystopia. Let's not dupe ourselves. We are not in utopia right now and we need help to get to a better place. The challenges of social inequality and human strife in our country and many parts of the world persist. We are facing chronic unemployment, unequal access to education and skills, the rise of new diseases and the health risks posed by viruses like COVID-19. We face the challenge of climate change and what that means for food security, our health and the environment. I refer to the book *Factfulness* by Hans Rosling, who defines a different approach to organising populations by how they live, so we can more intimately understand social and economic progress being made. Rosling divides livelihoods into four income levels with Level 1 representing extreme poverty (those living on less than \$2 a day) and at the other end of the spectrum is Level 4 (where people can afford to save, buy a car or a home, experience travelling for leisure, save for their children's university and even take risks like starting a business or changing careers.) Level 4 is for those earning \$1000 a month or more and there are only about 16-million Africans on the whole continent enjoying level 4 in this year, 2020. When we consider the distribution of African people in all the levels, we are certainly not in utopia today. The status quo is just not worth preserving.

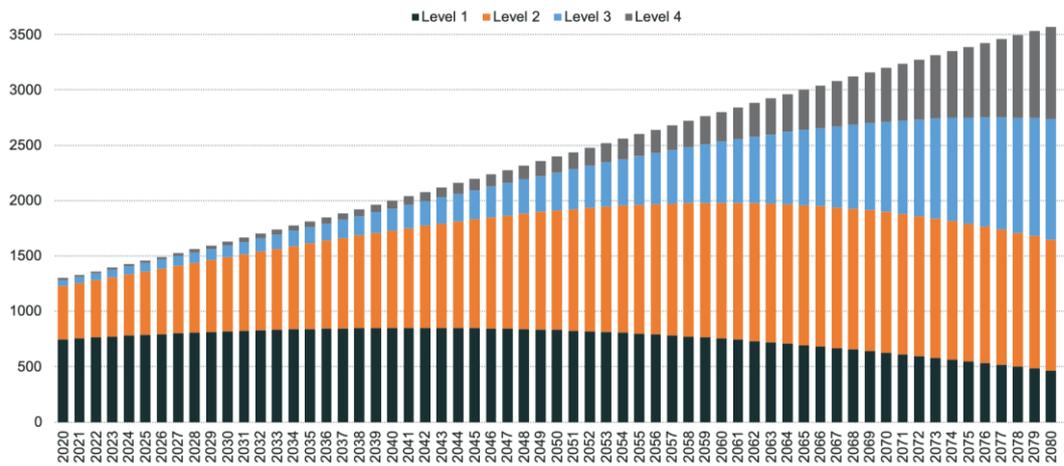
Valter Adao, a digital thought leader, said 'If we take the productivity achieved through manual labour over the last few decades and extrapolate that forward, it is not sufficient to maintain our GDPs, and therefore not enough to serve our needs. If we keep on doing what we did in the past, we are going to see a slowing down in our economies.' With the slow economic progress we are facing we are actually following linear growth in GDP that isn't meeting the needs of all people on this continent. We have to evolve faster to reach exponential productivity that can match our economic growth and social needs. I believe that AI, instead of being the thing we need to fear, that takes our lives and jobs, can instead give us a whole new path to evolution, giving us new capabilities. Let's look at AI as a path to **Accelerated Improvement**: instead of waiting for the millennia it has taken us previously for our natural human evolution to be able to adapt to cope with the increasing complexities of our world, let's use AI to make that leap in a few decades. Progress is an unstoppable force and you can either ride it into the future, letting it raise you to new heights, or you can plant your feet stubbornly in the sand, hold on and prepare to be drowned or left behind forever.

We can look at new technologies as a WIN WITH and use them to enhance our capabilities. Digital technologies enable us to be smarter, to see more accurately and to make better decisions. We are able to do more, be more efficient and productive, develop more affordable products and services to reach underserved markets, improve healthcare, expand access to education, see further into the future and predict outcomes multiple years into the future to avoid cancer and other illness. Given we are far from utopia today, how can we not explore these



options? The pressure to do things differently is only going to be compounded, as can be seen in Figure 1, which examines both expected population growth and income distribution. Breaking down population growth according to Rosling’s four income levels shows tremendous opportunity. There is increase of people living on levels 2 and 3, creating a huge middle class. Providing everyday services and products to levels 2 and 3 simply cannot be done at the costs currently paid by those of us living at level 4 pay. We have to change paradigms to serve our growing market. We need help. We need Accelerated Improvement.

Figure 1: African – Income Distribution



Source: UN data, World bank data, LifeCheq Research

Digital technologies can transform agriculture by making the work of smallholder farms more visible. For example drones flying over farms taking high resolution pictures can discover and analyse problems, pests and diseases affecting individual crops or vines on a farm; measure size, height and canopy volume, and use AI to predict with greater reliability the likely yield in any given area. High quality and timely data transforms the business of farming by facilitating access to competitive finance, insurance and growth beyond subsistence farming. Similar transformations will be experienced across other economic sectors. The use of smart IoT devices give us more eyes and ears to collect more information which can be analysed to gain insights, diagnose problems and using AI, predict future outcomes and prescribe how to achieve better outcomes. In our work at Rekindle Digital we are already helping companies along their digital transformation journeys to use digital technologies to tap into new revenue streams, reduce costs, enhance customer experiences and improve employee experiences. So many more services will be able to be delivered affordably – and this is already happening now.



Different Digital Skills - It's not all about coding!

- Skills for Inclusion**
Skills for people who will consume and use digital products and services
 - › Cyber Safety
 - › Email Etiquette
 - › Collaboration & Productivity Tools
 - › Data Processing
 - › Application User
 - › Capabilities behind Digital Technologies
- Skills to Thrive**
Skills for everyone to be able to perform in the future world of work
 - › Active Learning
 - › Creativity
 - › Critical Thinking
 - › Complex Problem Solving
 - › Collaboration
 - › Emotional Agility
 - › Effective communication
- Skills for Producers**
Skills for people who will create African digital products and services
 - › Cloud
 - › Process Automation
 - › IoT & Robotics
 - › Data Science & AI
 - › CyberSecurity
 - › User Design & UX
 - › Digital Software Development
 - › Devices and Infrastructure

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The ticking time bomb, which stop all possibilities in their tracks, is skills. This is why I invest much of my time at Rekindle Learning in identifying ways to leverage technology to accelerate how we build skills and new competencies. It is important to note that the digital skills of the future span differing degrees of complexity. Yes, we need coders and data scientists and other advanced tech. There is

no doubt we need more of these skills to produce our own African solutions that serve our interests. Skills for the producers will drive contextually-relevant African innovation.

But let's not forget that the mega tech companies are successful because their local markets avidly consumed their new innovative solutions. Unless large corporates, medium businesses and the public sector actually buy local innovation we won't see African innovations thrive. I believe the hindrance to local consumption lies with the buyers themselves, who need greater digital skills and awareness. You don't know that you need, or that what you need even exists. And you are certainly less likely to buy things you don't understand. Digital skills need to span the whole spectrum. Skills for inclusion are the ones everyone needs to be able to consume and purchase digital products and services. They include being able to use applications, online communication and collaboration tools, cyber safety, information processing and a fundamental understanding of the capabilities behind digital technologies. The hardest skills to impart and acquire are the skills needed to thrive, to be able to adapt and perform in the future. These are skills like communication, managing people, leadership and emotional agility. These skills also include critical thinking, creativity, and problem solving.

In order to develop the skills to thrive, we need to recognize that our current model of learning based on knowledge-transfer - is not going to cut it. The oft-used quote from Charles Darwin, 'it is not the strongest species that survive, nor the most intelligent, but the most adaptable to change,' gives us some clues. Being able to adapt to change entails more transformative learning which changes mindsets, values and behaviours to enable people to become self-starters, take initiative and direct their own life outcomes. We already know that you can give a promising nursing candidate amazing content, but that doesn't mean they will necessarily become a great nurse. What makes a great nurse is something else. That something else is about behaviours, mindsets and values. The



trick to developing mindsets and behaviours is that it has much less to do with ‘what’ we are taught (content) and more about ‘how’ we are taught when facing challenges, and exposure to a wide range of experiences and intelligent stimulation. Unfortunately most of our educational and human development endeavours focus on content-driven learning. Standardized testing and homogenous teaching were designed with the previous industrial revolutions in mind, when our memory and analytical function was what separated humans from every other species and machines.

We need to rather identify and focus on the core capabilities, the underlying functions, of a human being through which we can change ‘what we know’ like a hat, and adapt. Those core capabilities could be literacy and numeracy, and tools to think better and to process information by knowing how to validate it, organise it, analyse, categorise it. Whole brain function is required to support not only analysis functions where we zoom in to see the detail, but also synthesis functions where we zoom out to see larger patterns; when we look at the bigger picture, the why or purpose of things. Another core capability would be creativity and problem solving. While most people think creativity is about ‘thinking out of the box’, that typically does not work as we draw blanks when we try to think out of the box. In fact its more about becoming aware of the boxes we have created in our minds and thinking into different boxes. Fortunately, even adults can be trained to reconnect with creative abilities. Lastly, and most importantly, a can-do mindset is required with which people exercise an internal locus of control and innate agency to improve their life condition. Our locus of control is external when we perceive factors outside of ourselves to be driving an outcome for a particular task, while an internalized locus of control speaks to an appreciation of the cause-and-effect relationship that allows us to self-direct and author the outcome we seek. Locus of control drives one’s degree of independence.

The afore-mentioned capabilities are truly only gained through life experiences beyond our comfort zone, challenges just beyond our current ability that stretch us and by so doing, develop our neurology. Project-based learning, internships, work experiences and stimulating home and work environments are essential here and will be sufficient for some, at least for those who have the privilege of a manager or mentor dedicated to crafting out-of-comfort zone experiences to drive personal growth. This life experience gap goes beyond work experiences though. What about the young people who don’t have the benefit of listening and learning from their parents around the dinner table for decades, the benefit of being taken under someone’s wing and having access to conversations that inform how we make sense of the world, the benefit of being close enough to someone to model your work and behaviour on them? The mountain that young people must climb to be future-fit has risen to dizzying heights.



If developing adaptability entails immersive experiences, then how do we offer these? How do we create large-scale immersive and transformative learning experiences that consistently provide the right quality of experiences suitable for an individuals' progress across varied dimensions? Virtual Reality and Artificial Intelligence technologies present us with an opportunity to create a platform for artificially created experiences that can be consumed by millions at the same time. They provide an avenue to move from giving content to curating experiences in a manner that, while not real life, can nonetheless deliver most of the learnings. Imagine young people preparing for an interview by undergoing several practice experiences with a computer-created human being? Or developing communication and assertiveness skills that are practiced in an artificially created meeting similar to those in the workplace? Or tackling a project and engaging with an artificially created client who provides feedback and responds like a real client would? Or practicing specialised technical skills? Given the plight of young people, the African continent has to take the lead in the use of AI and VR to artificially create the experiences that will provide the stimulus required to develop young people's minds.

The 4IR is challenging us about what it means to be human. We can take actions now to ensure that new digital technologies help, and not hinder, humanity's future. The only limitation here is our imagination and how well we can use these tools to build a world that serves our mutual interests. The emerging research predicts that AI will create more jobs than it makes obsolete. It is easy to feel the loss of what was, when you can't imagine what will be, but a limitation of imagination doesn't mean there won't be new opportunities. This industrial revolution, like the ones before it, will push us to direct our energies to what we are actually better at.

In 1957, Kwame Nkrumah of Ghana proclaimed: 'we shall achieve in a decade what it took others a century... and we shall not rest content until we demolish these miserable colonial structures and erect in their place a veritable paradise.' More than half a century later, we still have not reached that veritable paradise. Today, we are standing at the doorway between the world of Utopia and Dystopia. But it's a Dystopia we need to leave behind now rather than imagining a Dystopia in the future. We can choose to architect a future that is a Utopia. I cannot think of a more exciting time to be human.

About the Author

An internationally renowned technology entrepreneur, Rapelang Rabana has amassed 15 years' experience building innovative technologies. She is the Founder of Rekindle Learning and Rekindle Digital, a thought leader on innovation and a Young Global Leader of the World Economic Forum. She holds a B.Bus.Sci (Hons Comp. Sci), and M.Sc. from the University of Cape Town.