

# The Fourth Industrial Revolution by Klaus Schwab

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## **BOOK REVIEW: *THE FOURTH INDUSTRIAL REVOLUTION*, BY KLAUS SCHWAB.\***

JAKE OKECHUKWU EFFODUH<sup>+</sup>

As the Founder and Executive Chairman of the World Economic Forum, Professor Klaus Schwab introduces *The Forth Industrial Revolution*<sup>1</sup> (4IR) to uncover the current technological revolution we live in and to explore how the world is witnessing a transformation that is inevitably affecting the way we live, interact and work. An astounding confluence of emerged (and emerging) breakthroughs that is spanning extensive areas of endeavor evidences this revolution. Some examples of the areas in which these breakthroughs have occurred include: (1) artificial intelligence (AI) robotics (such as machine learning<sup>2</sup>); (2) nanotechnology; (3) biotechnology; (4) quantum computing<sup>3</sup>; (5) blockchain<sup>4</sup>; (6) the Internet of Things (IoT)<sup>5</sup>; (7) 3D-printing, etc.

Schwab is the first person to introduce the world to the concept of the 4IR, and he does it through this book. Without a doubt, this ideation of the 4IR is “unlike anything humankind has ever experienced.”<sup>6</sup> Beyond the book’s credible projection of global accounts, this is relevant literature – not only for anthropology or innovative technology discourse, but also for legal academia, especially given the 4IR presents a challenge (and/or opportunity) for regulation,

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<sup>1</sup> Klaus Schwab, *The Forth Industrial Revolution* (Geneva: World Economic Forum, 2016).

<sup>2</sup> Machine learning is a type of artificial intelligence (AI) that provides computers with the ability to learn without being explicitly programmed. The process of machine learning is similar to that of data mining.

<sup>3</sup> Quantum computing is an area of study focused on developing computer technology based on the principles of quantum theory. Quantum theory explains the nature and behavior of energy and matter at the quantum (atomic and subatomic) level.

<sup>4</sup> A digital ledger in which transactions made in bitcoin or another cryptocurrency are recorded chronologically and publicly.

<sup>5</sup> This refers to the interconnection of computing devices embedded in everyday objects via the Internet, enabling them to send and receive data.

<sup>6</sup> See K Schwab, *supra* note 1 at 1.

governance, and education. As we shall see, the 4IR also has important implications for the conceptualization and enjoyment of human rights.

The 4IR is, simply put, the fourth major industrial era since the first Industrial Revolution, which took place during the eighteenth century. Schwab asserts that the world has experienced four industrial revolutions:<sup>7</sup> the first employed the use of steam engines for mechanical production; the second utilized electricity and the concept of division of labor to create mass production; the third (which grew in the middle of the last century) introduced information technology; and automated production processes; and now we have reached the fourth. At this stage, the 4IR, we are witnessing a digital transformation that pervasively impacts every work of life across the globe.

The book is divided into five parts, with the first part being the introduction. In the second part, Schwab describes the drivers of the 4IR as megatrends in three manifestations: physical, digital, and biological. These manifestations are giving rise to practical developments with tipping points that provide the context for the expected changes in global society. Some of these include the following: the projection that by the year 2025, ten percent of the world will wear clothes connected to the internet; an AI machine will be on a corporate board of directors; and the first transplant of a 3D-printed liver will be successful.<sup>8</sup> The third part of the book (which constitutes the book's largest part) is where Schwab engages with his theory of the 4IR and the impact of the 4IR on global economy, trade, international security, identity, morality, ethics and human connection, to mention but a few. The final two parts are titled "The Way Forward" and "Acknowledgements" respectively.

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<sup>7</sup> See K Schwab, *supra* note 1.

<sup>8</sup> See K Schwab, *ibid* at 26.

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As a citizen of the “Third World”, some thoughts occurred to me as I read this book. By simply imagining the possibilities of having billions of people connected by smart devices, with extraordinary processing power and access to data, excites me; not to mention that there are already algorithms used to foretell cultural interests or even software to discover new medications. However, I also felt a sense of despair and pessimism as I become aware of the gap that the 4IR further creates between the “West” and the “Rest”. This gap is not only a technological one but touches on almost every area of human development and agency. For example, in the West, genetic sequencing is now unbelievably cheap,<sup>9</sup> and humans and machines are augmenting and assisting each other with knowledge and skills. Meanwhile, there are four billion people in the “Third World” who tend to lack reliable internet access. For Africa, the second industrial revolution is yet to be fully experienced as nearly 1.3 billion people lack access to electricity. The problem rests not with the “failure” of the “Third World” to “catch up” to the 4IR, but it is how the 4IR raises concerns around issues of power asymmetry, security, and the resulting threats of inequality, disempowerment, and exploitation.

Schwab is convinced that since it took almost 120 years for the Spindle (the hallmark of the First Industrial Revolution) to spread outside Europe but took only less than a decade for the internet to permeate across the globe, then perhaps the gap between both worlds could close faster. According to him, however, this will happen only if governments, public institutions and the private sector do their part, and if citizens accept the Internet’s long-term benefits. Schwab states:

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<sup>9</sup> *Ibid* at 21. “Considerable progress has been achieved in reducing the cost and increasing the ease of genetic sequencing, and lately, in activating or editing genes. It took more than 10 years at a cost of 2.7 billion U.S Dollars, to complete the Human Genome Project. Today a genome can be sequenced in a few hours and for less than a thousand dollars.” See KA Wetterstrand, “DNA Sequencing Costs: Data from the NHGRI Genome Sequencing Program (GSP)” *National Human Genome Research Institute* (2 October 2015), online: <[www.genome.gov/sequencingcosts/](http://www.genome.gov/sequencingcosts/)>.

I am convinced that the fourth industrial revolution will be every bit as powerful, impactful and historically important as the previous three. However, I have two primary concerns... First, I feel that the required levels of leadership and understanding of the changes underway, across all sectors, are low when contrasted with the need to rethink our economic, social and political systems... Second, the world lacks a consistent, positive, and common narrative... that is essential if we are to empower a diverse set of individuals and communities and avoid a popular backlash against the fundamental changes underway.<sup>10</sup>

From a human rights lens, reading this book has provoked many questions. With respect to the future of jobs, for example, if it will take 118 years before economic gender parity is achieved around the world,<sup>11</sup> will the 4IR improve or worsen conditions? How will the 4IR reduce these projected years, shrink this gap, or affect the role that women will be able to play in new digital workplaces? Automation has caused massive job losses in male dominated sectors (such as manufacturing, construction, etc.) due to machine substitution. On the other hand, however, some female dominated sectors cannot be substituted as they rely on intrinsically human traits like empathy and compassion to thrive (e.g. psychology, nursing, event planning, and so on). However, because men still tend to dominate STEM fields (Science, Technology, Engineering and Maths), this increasing demand for specialized technical skills will likely exacerbate gender inequalities.<sup>12</sup> Furthermore, as doctors in the West are “trending” towards telemedicine and lawyers move towards “tele-lawyering,” telecommunications know-how and related information technology skills are now a need-add, including in the provision of clinical legal education.

While Schwab cannot predict the gendered impact of jobs in the 4IR, he pushes for a redesign of policies to empower women, which makes sense. It would have been apt if he also suggested the need to advance the enforcement and “internalization” of global international

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<sup>10</sup> See K Schwab, *supra* note 1 at 8.

<sup>11</sup> *Ibid* at 2 (quoting the 10th edition of the World Economic Forum’s *Global Gender Gap Report 2015*).

<sup>12</sup> *Ibid* at 44.

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human rights standards for women<sup>13</sup> – particularly now that an even greater threat is somewhat foreseeable.

Further questions include: when a robot becomes a staff of an organization (*e.g.* on a recruiting panel), will it be blind to race, gender, or age? If so, is this a desirable result? Will robots understand intersectionality? Considering that Karl Marx expressed concern regarding the ways hyper-specialization can reduce purpose,<sup>14</sup> this is also a concern for the 4IR given Schwab’s concern for the “younger generation,” amongst whom many consider white collar jobs to be the norm.<sup>15</sup> He fears that this generation may not find “happiness” (purpose), or will have to deal even more with corporate cravings of a work-life balance and “harmonious work-life integration.”<sup>16</sup>

It is comforting to read that the 4IR will enable firms to reuse resources and assets and re-purpose energy for further uses, thereby lowering emissions and resource loads. Due to improvements in technology, “greener machines” are helping corporate performance meet environmental standards (especially in countries like Canada and the Netherlands).<sup>17</sup> According to Schwab:

In this revolutionary new industrial system, carbon dioxide turns from a greenhouse pollutant into an asset, and the economies of carbon capture and storage move from being cost as well as pollution sinks to becoming profitable carbon-capture and use-production facilities.<sup>18</sup>

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<sup>13</sup> See *e.g.* the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) and the General Comments and Reports of the CEDAW committee.

<sup>14</sup> Schwab references Marx’s theory of alienation. See Gary North, “Marx’s view of the Division of Labor” *Foundation for Economic Education* (1 January 1969), online: Fee <[fee.org/articles/marxs-view-of-the-division-of-labor/](http://fee.org/articles/marxs-view-of-the-division-of-labor/)>.

<sup>15</sup> See K Schwab, *supra* note 1 at 50.

<sup>16</sup> *Ibid.*

<sup>17</sup> See *e.g.* the *Canada Foundation for Sustainable Development Technology Act*, SC 2001, c 23. The Act provides for the funding of technologies that provide solutions to issues related to climate change, clean air, water, and soil quality.

<sup>18</sup> See K Schwab, *supra* note 1 at 66.

I agree with Schwab that the 4IR holds potential for creating cleaner, more inclusive and more resource-secure economies, as well as for improving the management and governance of the global environment (a crucial human rights goal). However, I wonder – if energy conservation did not have a business case, would transnational corporations buy in? Where does the 4IR locate the struggles of environmental justice and “activist forces”?<sup>19</sup> How does the 4IR legitimize or de-legitimize environmental causes? Is there value-add or value-loss when these struggles move from the streets to digital spaces? It may be too critical to expect a rights-conscious or access-to-justice perspective from Schwab who has spent the last forty years engaging mostly with political leaders and CEOs. Yet, it is important to note that this book was also published after a decade of “hot” international debates, and a resulting unanimous decision in the United Nations (a stone throw from the World Economic Forum) that multinational corporations have a responsibility to respect human rights.<sup>20</sup>

Schwab advises that governments must adapt to the fact that state power is now shared with non-state actors and institutional influence is now also shared with loose networks:

It would take a book dedicated to this subject alone to explore all the multifaceted impacts of the fourth Industrial revolution on governments but the key point is this: Technology will increasingly enable citizens, providing a new way to voice their opinions coordinates of your efforts and possibly circumvent government supervision I see possibly because the opposite might just as well be true with new surveillance technology has given rise to all-too-powerful public authorities.<sup>21</sup>

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<sup>19</sup> The term “Activist Forces” is an expression advanced by Obiora Chinedu Okafor to recognize the role of local activism in international law. See Obiora Chinedu Okafor, *The African Human Rights System, Activist Forces and International Institutions* (New York: Cambridge University Press, 2007).

<sup>20</sup> Human Rights Council, “New Guiding Principles on Business and Human Rights endorsed by the UN Human Rights Council” OHCHR (16 June 2011), online: <[www.ohchr.org](http://www.ohchr.org)>. Human Rights Council, *Guiding Principles on Business and Human Rights: Implementing the United Nations “Protect, Respect and Remedy” Framework*, UNHCR, 17th Sess, UN Doc A/HRC/17/31 (2011), online: <[www.ohchr.org/Documents/Issues/Business/A-HRC-17-31\\_AEV.pdf](http://www.ohchr.org/Documents/Issues/Business/A-HRC-17-31_AEV.pdf)>.

<sup>21</sup> See K Schwab, *supra* note 1 at 68.

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His proposal for “Agile Governance”<sup>22</sup> resonates with the current discourse within academia for the need for dynamism in our “post regulatory” era, especially with examples like the WikiLeaks saga.<sup>23</sup> Here, Black’s position on “decentering regulation”<sup>24</sup> gains corroboration within Schwab’s proposal. In light of today’s hyper-connected world, there is both an information overload (which gives room to “fake news”<sup>25</sup>) and a widening of (digital) social exclusion. The right to privacy, though not accounted for by Schwab in this book, is becoming a near implausible right given measures taken by many governments to manage real or perceived increased security threats. Beyond fears of nuclear attack (in respect of which Schwab frankly states that a nuclear taboo has emerged),<sup>26</sup> cyber warfare and autonomous warfare (which involves AI-powered weaponry) now threatens a new type of war: “robo-war”, which will require little or no human intervention. Again, there is a huge question mark over what this means for the “Third World”, a concern that Schwab does not address with great consideration in this book. A country like Nigeria, with the one of the most powerful ground military forces on the continent, needs to plug into this new armory or lose its military power. On a positive account though, the recent WannaCry malware attack that rocked 99 countries<sup>27</sup>, left African

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<sup>22</sup> *Ibid* at 70 (“[m]eaning that regulators must find ways to adapt continuously to a new, fast changing environment by reinventing themselves to understand better what they are regulating”).

<sup>23</sup> See *The WikiLeaks Saga*, online: YaleGlobal Online <yaleglobal.yale.edu/special-reports/wikileaks-saga>.

<sup>24</sup> According to Julia Black, “decentering” is a term often used to encompass several notions, and has both positive and normative dimensions. It is used to express the observation that governments do not (and the proposition that they should not) have a monopoly on regulation and that regulation is occurring within and between other social actors, for example: large organizations; collective associations; technical committees; professions, etc. These all operate without the government’s involvement or indeed formal approval; there is “regulation in many rooms”. Julia Black, “Decentering Regulation: Understanding the Role of Regulation and Self-Regulation in a ‘Post-Regulatory’ World” (2001) 54:1 *Curr Leg Probl* 103.

<sup>25</sup> Fake news is a type of yellow journalism that consists of deliberate misinformation or hoaxes spread via traditional print and broadcast news media or online social media. See D Leonhardt and SA Thompson, “Trump’s Lies” *The New York Times* (21 July 2017), online: <www.nytimes.com/interactive/2017/06/23/opinion/trumps-lies.html>.

<sup>26</sup> See K Schwab, *supra* note 1 at 89. Schwab states that the fear of nuclear warfare has given way to the relative stability of mutually assured destruction (“MAD”).

<sup>27</sup> Selena Larson, “Massive cyberattack targeting 99 countries causes sweeping havoc” *CNN* (13 May 2017), online: <money.cnn.com/2017/05/12/technology/ransomware-attack-nsa-microsoft/index.html>.

states mostly unaffected as they were nearly as “logged in” online or dependent on cloud technologies.

Schwab makes a brilliant case for the usefulness of regional international treaties and ethical standards and this can be likened to Okafor’s theory of correspondence.<sup>28</sup> In this case, Schwab is positing that we must accommodate modernity but value regional and domestic structures, especially with respect to how the 4IR as a theory will be utilized by labor-led ecosystems<sup>29</sup> and with the middle-class as an indicator for “communicating” empowerment. According to Schwab, “individuals, civil society groups, social movements and local communities” should never be stripped of their relevance.<sup>30</sup>

I find that the fact that Schwab closes the book with a focus on “the individual,”<sup>31</sup> the “identity, morality and ethics”<sup>32</sup> of humanity speaks volumes. With every innovation and advancement in technology, almost everything boils down to the individual, which validates the need for human welfare and dignity. The 4IR is helping the world to experience better efficiency and higher quality in living, working, being, and developing, but it should be a complement to the best parts of human nature, such as creativity, empathy, and stewardship. I see the 4IR as providing a redesign for humanity and Schwab as providing the insightful entrée into this subject.

This book is an obligatory food for thought especially for all those interested in exploring the future of human agency, human welfare, and human rights. The 4IR is not only altering the

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<sup>28</sup> See OC Okafor, *supra* note 19. According to Okafor, “correspondence” is not coerced compliance, which is associated with “top down” directives by a treaty body. Rather, it comprises altered and altering practices that indicates greater awareness of and reliance on international instruments among activist forces like NGOs.

<sup>29</sup> See K Schwab, *supra* note 1 at 92.

<sup>30</sup> *Ibid* at 95.

<sup>31</sup> *Ibid* at 97.

<sup>32</sup> *Ibid* at 98.

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“what” and the “how” of doing things, but is also the question of “who” we are – our normative influences, identities, and even the jurisdictions we fall under:

The changes are so profound that, from the perspective of human history, there has never been a time of greater promise or potential peril.<sup>33</sup>

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<sup>33</sup> *Ibid* at 2.