A REVIEW OF HARARI'S "21 LESSONS" ON THE COMING TECHNOLOGICAL CHALLENGES

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Introduction

"21 Lessons for the 21st Century" is a 2018 book written by the bestseller Israeli author Yuval Noah Harari published by Spiegel and Grau, New York (i.e. the main reference for this review). The key ideas in "21 Lessons" were developed over two major previous works by the same author, "Sapiens" and "Homo Deus" published in 2011 and 2015, respectively. While the former looks to humanity's history—i.e. the history of Homo Sapiens over the past tens of thousands of years, and the latter looks ahead to our distant future in the next 100 or more years, "21 Lessons" is a collection of essays about where humanity has reached presently, and where it might be heading to in the not so distant future.

The insight of "Sapiens," Harari's first book, was that humans dominate the globe not because we are smart or rational, but because 70,000 or so years ago we humans developed the ability to agree to believe stories that we know need not be true. These stories or "fictions" as he refers to them are about religion as well as political and economic systems which have enabled us, humans, to work together cohesively towards a common goal, thereby turning us into the superior species on earth today. Put simply, belief in fiction is what has united us in thousands if not millions, allowing us to create empires, utilize money, and follow religions. The big insight in his second book, "Homo Deus" is that Artificial Intelligence (AI) and other technologies are about to transform societies and humanity far more—and far more rapidly—than almost anyone realizes. He argues that in the era of advanced technology and computational power, for example, authority shifts away from us humans to "algorithms"; Everything is a combination of deterministic and randomness which algorithms can "understand" better than us humans, and our futures, Harari warns, will be left to the mercy of those who have our data (discreetly or willingly), and may therefore manipulate us, humans, whether we remain as Homo Sapiens or some augmented cyborgs.

From the very first few pages of the "21 Lessons", Harari draws our attention immediately to three possible catastrophes that humanity faces today; the threat of (1) nuclear war, (2) climate change and ecological collapse, and (3) the dangers of disruptive technologies, especially AI. In this review, in line with this journal's theme for the current edition, "technology adoption and human interaction," I will focus on the third of these possible dangers, which in fact is the theme of the first of the five parts of the book entitled "The Technological Challenge" which continues the discussion of the coming technological change and its implications first explored in "Homo Deus".

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Biotechnology & Liberalism

Harari argued in "Homo Deus" that with the numerous and radical innovations in the field of biotechnology, genetic engineering, cognitive enhancement, and super-longevity, we humans will soon have the power to re-engineer the physical, mental and biological structure of human beings, both organically and even inorganically. In "21 Lessons", he further warns that this emerging biotech fused with advances in infotech, however, has enormous potential to very well undermine our conception of humanity and shake the humanist foundations of modern civilization.

Humanism, the contemporary model of the world, Harari states simply, is the belief that human *feelings* are the ultimate source of authority. That is, when confronted with any big questions or dilemmas in life and in society, humanism expects the *feelings* and *free* choices of us humans to provide an answer. After many centuries of seeking authority in the Gods, and in Kings and in priests, in the modern age, we as individuals have learned to listen to ourselves, to follow our heart, and to be true to ourselves.

And since no one can understand one's feelings and free choices better than oneself, the argument continues, no one should have absolute authority over any other individual.

Hence, humanist politics believes that the voter knows best and that indeed governments should serve the voter, while humanist economics says that the customer is always right, and businesses exist to serve the customer. Arguably, humanist aesthetics too believes that "beauty is in the eye of the beholder"—hence, there is no objective beauty, only subjective values, and judgment.

Furthermore, the main aim of education arguably would be to teach students to think for themselves because they as individuals are the ultimate source of authority.

But in the 21st century, Harari argues that humanism is facing an enormous challenge, as he likes to put it, "not from dictators or demagogues," but from AI, big data algorithms, and the few new oligarchs that harness data, which they can use to hack us, humans. And once humans are hacked, the authority is shifted once again away from us humans to those institutions that have our personal data, use them to "know" us better, and eventually manipulate us for their gain and profit.

In the World Economic Forum Annual Meeting at Davos 2020, Harari provided us with a clever formula:

$$B \times C \times D = AAH$$

where B is biological knowledge, C is computing power and D is data, and when these are "multiplied" together equals the AHH or the ability to hack humans. That is, given Harari's premise that everything that makes up an organism including us humans can actually be decoded and analyzed as data—i.e. if our full range of emotions, thoughts, decisions, and values we believe in are just the summation of a series of chemical impulses in the brain, caused by neuronal activation patterns defined in part by our past experiences and in part by our background genetics—then algorithms backed by powerful AI technology can hack the human species. Here is an interesting quote:

"Once we begin to count on AI to decide what to study, where to work, and who to marry, human life will cease to be a drama of decision-making Imagine Anna Karenina taking out her smartphone and asking the Facebook algorithm whether she should stay married to Karenin or elope with the dashing Count Vronsky" [p. 56].

In the 21st century, this merging of organisms and algorithms (biotech with infotech) allows even humans to be hacked, as this is already evident from the changes in our purchasing habits (e.g. Amazon), our trust in social media for information, whether fake or real (e.g. Facebook), directions (e.g. google maps), to gene therapy and mutation (and increasingly to perhaps even implanting chips and inorganic parts to augment our bodies and brains), all of which allows the algorithm to know us better than ourselves (and the bar Harari likes to remind us is set rather low in this respect given that we are quite

ignorant of the knowledge of ourselves, our histories and biases, to say the least). Moreover, as algorithms get even more powerful and will eventually "get under our skins"— with biometric sensors, for example— the potential for algorithms to hack human feelings and manipulate and predict human feelings and decisions will continue to grow exponentially, and in the wrong hands, liberal democracy and the market economic system as we know it today may give way to digital dictatorships. We can then say farewell to free will, free markets, and liberal democracy, as well as the celebration of human intelligence, experiences, values, and uniqueness—i.e. the end of liberal humanism?

Artifical Intelligence & Useless Class

In "Sapiens" Harari refers to three major revolutions in the history of the human species, (1) the cognitive revolution, when lop larger and more efficient brains useful for our species, (2) the scientific revolution, most strikingly, with the advancement of technology, increased automation, the increasing power of algorithms, and so on, Harari warns that almost all jobs will become fully automatable, resulting in what he refers to as the makings of a "useless class", people without any economic or political value, and (3) the challenge is much more serious than when hunters and gatherers had to find work on the lands with the agricultural revolution, or when farmers had to become cashiers at local stores with the industrial revolution. Many of the jobs AI is taking over are precisely those that humans enjoyed cognitive and intellectual superiority.

Below is a relevant quote:
"It is dangerous just to assume that enough new jobs will appear to compensate for any losses. The fact that this has happened during previous waves of automation is absolutely no guarantee that it will happen again under the very different conditions of the twenty-first century. The potential social and political disruptions are so alarming that even if the probability of systemic mass unemployment is low, we should take it very seriously" [p. 33].

But even before the coming triumph of data which will defeat the domain of individual autonomy, and when morality will take on the birth of the sedentary agricultural tribes although having brought stability, security and culture, also brought more inequalities, an increase in internal violence (which, of course, was present even in hunter-gatherer tribes) and further deficits and diseases in the human body. completely new and unimaginable shades, Harari foresees already upheavals in society and economics as automation eliminates millions of jobs. While new jobs will certainly be created in the technological revolution, it is unclear whether people will be able to learn the necessary new skills fast enough. For example, in his talk at the World Economic Forum Annual Meeting at Davos 2020, he asked his audience to imagine a 50 years old truck driver who has just lost his/her job to a self-driving vehicle, but now there are new jobs in designing software or in teaching yoga to engineers. It remains difficult however for the 50 years old truck driver to reinvent himself or herself as a software engineer or as a yoga teacher.

Moreover, this re-learning and re-inventing oneself may happen not just once but a number of times in one's lifetime, which apparently is getting longer thanks to technological advances in health care, and so on. Harari puts on his historian cap once again when he argues that while in the past, humans had to struggle against exploitation, in the 21st century, the really big struggle will be against irrelevance, which arguably is much worse than to be exploited, as those who fail in the struggle against irrelevance would constitute a new useless class people, constituting of those neither having the opportunity to empower themselves nor to spend their time on useful work.

Some Reflections & Concluding Thoughts

Many readers of "21 Lessons" may find that it paints a rather gloomy image of humanity's future especially with the risk of autocracy—the situation which arises when we delegate decisions to machines because they make better ones than we do. However, Harari is not unaware of the many good changes that technology has presented humanity, but he is quick to claim that, as a historian and philosopher, it is his job to look at what may easily be overlooked, to warn us about the dark side of the age of the glorious technological revolution. Be as it may, in "21 Lessons", Harari's premise that organisms are nothing more than algorithms has strong philosophical implications, as well as serious implications on the idea of free will, future religions, and so on—all of which he investigates more carefully in the rest of the book to varying success.

But what does all this mean in the post-Covid era? Having argued that the rise of AI will impact our lives greatly, from purchasing habits to elections in a "democratic" society, and providing us with abundant warnings, from humans becoming merely "data cows" to the dangers of technological unemployment and the crisis in liberal democracy, what can or what should we do? Harari asks, "How do you live in an age of bewilderment, when the old stories have collapsed, and no new story has yet emerged to replace them?" [p. 61]

For one, Harari strongly argues that global problems demand *global* solutions. An important example of his argument for global solutions is the possibility of immense inequality arising from the immense wealth created by a few high-tech hubs. And once again putting on his historian cap, he warns that just as in the 19th century when a few countries like the UK and Japan industrialized first then went on to conquer and exploit most of the world, if we are not careful, a similar pattern will happen in the 21st century with AI, as is already seen in the apparent AI arms race between China (by some estimates representing about 1/3 of the world's AI research production) and the USA (about 1/5) leading the race, will concentrate wealth in these countries and corporations (e.g. Baidu, Tencent, Alibaba, Facebook, Amazon, Apple, etc.), while other countries (and companies) will either go bankrupt or merely become exploited data colonies. Unless we take some action at the global level to distribute the benefits and power of AI between all humans, AI will create immense inequalities, with the possibility of a "K-shape" post-Covid economic recovery becoming more likely as we begin to see a clear separation between a very small elite of super-rich (with almost semi-divine powers) able to shape reality more or less to their liking and an overwhelming majority of "data cows" and "useless" human beings.

But what more can we do on an individual level to prepare ourselves for the future? Fast forward to the last part of his five parts book, which is appropriately entitled "Resilience", Harari suggests at least three important skills we need to face the challenges of the immediate future: These are, to encourage and develop (1) the ability to learn and re-learn (and re-invent oneself), (2) critical thinking, and (3) empathy and communication skills. The ability to learn and re-learn is critical in the face of increasing uncertainties in the labor market as AI takes over our jobs; critical thinking is vital as we need to better understand our place in the era of "information overload" and fathom institutions that may help shield us from various unwanted technological disruptions; empathy and communication skills cannot be neglected as we work together in search of truly global solutions to the various existential threats we as humans face today. This echoes the current call that schools should switch to teaching the four C's; critical thinking, communication, collaboration, and creativity, which teach us to be more adaptable especially by learning how to learn, as well as encouraging resilience, adaptability, curiosity, critical thinking, problem-solving, and effective collaboration.

I would like to end this review by sharing Harari's thoughts in a recent interview with the Financial Times when asked what supposedly we may say when we look back at the COVID-19 pandemic, say, a hundred years from today. He believes that we will look back at this period as having tremendous scientific achievement, especially in medicine and health sciences (understanding the pathogen took only a couple of weeks and developing a vaccine only a year!) While science has made tremendous strides, Harari argues strongly that we will look back at this period as an era of terrible political failure, which is responsible for the terrible way the global pandemic has destroyed the lives and livelihoods of millions around the globe.