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TECHNOLOGY vs. HUMANITY



The coming clash between
man and machine

Gerd Leonhard

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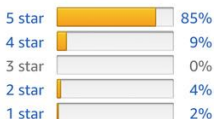
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Introduction

How can humanness prevail in the face of exponential and all-encompassing technological change?

Our world is entering a period of truly transformative change where many of us will be surprised by the scale and pace of developments we simply hadn't anticipated. These exponential technological advances offer tremendous potential, and with these opportunities come tremendous new responsibilities.

Humanity's biggest challenge

I believe the scale of change caused by recent, unforeseen events such as Brexit (the UK's June 2016 referendum decision to leave the European Union) will be miniscule compared to the impact of an avalanche of technological change that could reshape the very essence of humanity and every aspect of life on our planet.

In the past, each radical shift in human society has been driven primarily by one key enabling shift factor—from wood, stone, bronze, and iron, to steam, electricity, factory automation, and the Internet. Today, however, I see a set of science and technology enabled Megashifts coming together that will redraw not only commerce, culture, and society, but also our biology and our ethics.

A manifesto for furthering human flourishing

Let me be clear: Technology vs. Humanity is neither a celebration of the rapidly onrushing technology revolution nor a lament on the fall of civilization. If, like me, you're a film buff, then you've probably

already had more than enough of Hollywood's utopian visions and dystopian warnings. The future cannot be created based on blind optimism or paralyzing fear!

My goal with this book is to amplify and accelerate the debate about how to ensure that we guide, harness, and control science and technology developments so that they fulfill their primary purpose, which should be serving humanity and furthering human flourishing.

My ambition is to take the discussion beyond the realms of the exuberant technologists, serious academics, and thoughtful analysts to express a set of concerns that are nowhere near to being addressed or even recognized by the population at large. As a futurist—and increasingly more of a nowist—I am also hoping to give real presence and current urgency to a future that seems beyond comprehension and unworthy of attention for many.

As such, this book is deliberately designed to be a passionate discussion starter for what I consider to be the world's most important conversation. I believe my role here is to open up and catalyze the debate; hence, I have set out to craft a spirited manifesto rather than a blueprint or “how to” guidebook. To help stimulate and further that debate, I will expand on the themes outlined in the book through my future talks, online contributions, and films.

Just because we can, it doesn't mean we should

I believe we need to step back from an expert-led debate about what's possible and how to achieve it. Instead, I think we must start with a more fundamental exploration of what role we want these transformative technologies to play in serving humanity: Just because we can, it doesn't mean we should.

To help guide this exploration, I have set out what I believe to be the driving forces of change, and presented an assessment of their potential impacts and implications. I have highlighted many fundamental questions raised by the accelerated—and in many cases exponential—pace of development across multiple fields of science and technology.

I argue that we must place human happiness and well-being at

the heart of the decision making and governance processes that will shape future investments in scientific and technological research, development, and commercialization because, in the end, technology is not what we seek, but how we seek.

I go on to present a range of different scenarios on how things might play out depending on the development path we take to the future. I conclude with a starter set of straw man ideas to kick-start discussions on how to choose the best path for humanity, and how to make good decisions along the way.

To open up this ambitious conversation and help guide the discussion, I have structured my thoughts into twelve key chapters:

Chapter 1: A Prologue to the Future – Halfway through the century's second decade we are at a critical pivot point in technology evolution, a hinge moment when change will not only become combinatory and exponential but inevitable and irreversible. Here I argue that now is our last chance to question the nature of these coming challenges, from artificial intelligence to human genome editing. Striking a balance will be the key.

Chapter 2: Tech vs. Us – In this chapter, I explain why technology may increasingly simulate and replace—but can never become or be us. Technology has no ethics, and therefore its imminent entry into our most private lives and biological processes must be negotiated as a top civic and corporate priority. I examine the nature of ethics as a human signifier and differentiator, transcending differences of religion and culture.

Chapter 3: The Megashifts – Digital transformation is being touted as the paradigm shift *du jour* across enterprises and the public sector—when in fact it is just one of ten Megashifts that will interact and alter the face of human life forever. I explore these Megashifts—from mobilization and automation to robotization. These are not slow evolutionary processes which we will have time to integrate and adapt to. Rather, they will trigger a tsunami of disruption and

change, potentially equating to a mass extinction event for much of the existing global commerce infrastructure.

Chapter 4: Automating Society – This chapter challenges the pervasive and seriously misleading myth that automation will only disrupt blue-collar—or even white-collar—labor. The coming wave of automation will move way beyond the factory or public infrastructure and into our very biological processes such as aging and even giving birth. Used as we are to the gradual societal shifts brought about by previous change waves, often allowing decades to adjust and respond, I ask if we as a tribe are ready to abdicate our human sovereignty to the faceless forces of technology? Are you ready for the biggest loss of free will and individual human control in history?

Chapter 5: The Internet of Inhuman Things – This chapter explores the potential challenges posed by the Internet of Things—the current dominant narrative within digital transformation, with thousands of corporate strategies riding on its tailwinds. Have we paused to ask ourselves the difference between algorithms and what makes us essentially human—what I call the androrithms? Will the Internet of Inhuman Things gradually and then suddenly require us to forgo our humanity and become ever more mechanistic just to remain relevant? As computing becomes mobile, then wearable, and soon ingestible or implantable, will our distinct planetary advantage as a species be sacrificed for a spurious digital hit?

Chapter 6: Magic to Manic to Toxic – Here I examine how our love affair with tech often follows a predictable curve from magic to manic to—ultimately—toxic. As we allow ourselves to experience life as an ever more mediated and processed sequence of encounters, we may think we are enjoying ourselves, but in reality we are simply being hot-wired by our hormones—hormones increasingly targeted by the gentle purveyors of “big tech.” As we rave through the all-night honeymoon party that is technological progress, it’s salutary to think about the hangover—the price to be paid tomorrow, and forever.

Chapter 7: Digital Obesity: Our Latest Pandemic – This chapter discusses how digital obesity may not be as currently familiar as the physical kind, but is rapidly developing into a pandemic of unprecedented proportions. As we wallow and pig out on a glut of news, updates, and algorithmically engineered information, we also entertain ourselves in a burgeoning tech-bubble of questionable entertainment. Taking into account the coming tidal wave of new technologies and digital engagement platforms, it's high time to think about digital nutrition just as we already do about bodily nurture.

Chapter 8: Precaution vs. Proaction – This chapter sets out the argument that the safest—and still most promising—future is one where we do not postpone innovation, but neither do we dismiss the exponential risks it now involves and hand it off as “somebody else’s problem.” The bill passed on to the next generation for today’s new technology gambles cannot be postponed—any downside will be immediate and unprecedented in scale. I argue that precaution and proaction, the two principles often deployed to date, are both insufficient to deal with a combinatorial, exponential scenario where waiting will be as dangerous as firing ahead. Transhumanism—with its lemming-like rush to the edge of the unknown—represents the scariest of all present options.

Chapter 9: Taking the Happenstance out of Happiness – Money talks, but happiness remains the bigger story. Happiness is not only considered the ultimate goal of human existence across philosophies and cultures, it also remains an elusive factor resistant to exact measurement or technological replication. As big tech simulates the quick hits of hedonistic pleasure, how can we protect the deeper forms of happiness that involve empathy, compassion, and consciousness? Happiness is also related to luck, to happenstance—but how will we use technology to limit the risks of human life and still preserve its mystery and spontaneity?

Chapter 10: Digital Ethics – In this chapter, I argue that, as technology permeates every aspect of human life and activity, digital ethics will evolve into a burning, un-ignorable issue for every individual and organization. At present we do not even have a common global language to discuss the issue, let alone agreement on accepted rights and responsibilities. Environmental sustainability is often brushed aside by the developing economies as a first world problem and is always sidetracked during economic recessions. In contrast, digital ethics will force its way to a permanent position at the front and center of our political and economic lives. It's time to have the ethical conversation about digital technology—a potentially greater threat to continued human flourishing than nuclear proliferation.

Chapter 11: Earth 2030: Heaven or Hell? – As we move imaginatively into the near and medium future, we can easily visualize some of the gigantic changes altering work and life out of all recognition—these are explored here. Many of these seismic changes are to be welcomed per se—like working for a passion rather than for a living. However, many of the most basic privileges we once took for granted, like freedom of choice in consumption and independent free will in lifestyle, could become vestigial echoes or the preserves of ultra high-net-worth individuals. Heaven or hell? Make your choice, but do it now.

Chapter 12: Decision Time – In this closing chapter I argue that it's crunch time for tech adoption—not the application of technology itself, but the deeper integration and delineation of technology in human life. Numerous ethical, economic, social, and biological issues will simply not wait for another forum or the next generation. It's time to regulate mass technology application just as we would any other transformational force such as nuclear power. This is not the conclusion of a rich dialogue, but the beginning of a conversation that needs to become mainstream in our media, our schools, our government, and—most immediately—our boardrooms. The time for technologists and technocrats to simply hand the ethical buck over to someone else has passed.

GERD LEONHARD

I hope that this book inspires you to think deeply about the challenges we face, and I invite you to contribute to this conversation by becoming a member of the techvshuman/TVH community at www.techvshuman.com.

Gerd Leonhard
Zurich, Switzerland
August 2016

Chapter 10

Digital Ethics

Technology has no ethics—but humanity depends on them.

Let's do some exponential math. If we continue on the current path, in just eight to 12 years—depending on when we start counting—overall technological progress is going to leap from today's pivot point of four to 128. At the same time, the scope of our ethics will continue to limp along on a linear, step-wise, and human scale of improvement, from four to five or six if we're lucky; it will improve just a little bit as we adapt to a new framework.

Even if Moore's Law may eventually cease to apply as far as microchips are concerned, many of the fields of technology, from communications bandwidth to artificial intelligence (AI) and deep learning, are still likely to grow at least exponentially and with combinatorial effects—the changes reinforcing one another.¹⁸⁶

Zoom forward another ten years, and we may indeed end up 95% automated, hyperconnected, virtualized, uber-efficient, and much less human than we could ever imagine today. A society that sleepwalks down the exponential growth-path of the Megashifts (see chapter 3), a society that does not pause to consider the consequences for human values, beliefs, and ethics, a society that is steered by technologists, venture capitalists, stock markets, and the military, is likely to enter a true machine age.

So what are ethics? Going beyond the simple answer, how one should live, the Greek word *ethos* means custom and habit.¹⁸⁷ Today,

we often use ethics as a synonym or as shorthand for morals, values, assumptions, purposes, and beliefs. The primary concern of ethics is to question whether something is right or not in a given circumstance. What feels right to you is governed by your ethics, and in many cases it's hard to explain why something does not feel right. That is clearly one of the challenges of agreeing on even the most basic ethical rules for the exponential age we are about to enter. Nevertheless, later on I shall attempt to formulate some ethical rules—or principles to guide technology development.

“Today the needful work is to distinguish ourselves from our machines. It’s to rediscover, for example, that all knowledge is knowledge of man, and that nothing worth calling an ideal can be found in an engineered world, but only in ourselves.” –Stephen Talbott¹⁸⁸

The bio-ethicist Larry Churchill suggests, “Ethics, understood as the capacity to think critically about moral values and direct our actions in terms of such values, is a generic human capacity.”¹⁸⁹

So if ethics—to think critically about moral values and direct our actions accordingly—is indeed a generic human capacity, should we (a) never expect machines or computers to really understand them, and therefore be very cautious about their increasing self-learning capacities, or (b) try to encode some kind of basic ethics into software and teach our machines to at least understand and respect them—the topic of so-called machine ethics?¹⁹⁰ This is an important question we will seek to answer here.

What happens to our ethics if machines become self-learning?

Ethical questions arise quickly alongside the exponential progress of technology, for example, with self-driving cars, whom should the car run over if an accident is totally unavoidable? In the case of home-care robots, what should the robot do if the patient refuses to take her medication? When machines stop following pre-programmed decision trees and start learning things themselves, will they also

learn those things that even humans find hard to express and codify?

Humans don't simply hard-code decisions such as "If this patient has a 35% chance of a life-threatening medical issue, then she must take these medications even if force is required." Of course, humans do different things at different times, and they do make mistakes. Would we accept that from a robot, and would we accept being treated in such a way by a robot?

In his 1942 short story *Runaround*, science fiction writer Isaac Asimov defined the now infamous Three Laws of Robotics:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws.

Are these laws still pertinent, today, and would they go straight out of the window with machines that self-learn? Maybe a care robot would need to harm human beings (albeit marginally) because another, more authorized human being (for example, a doctor) commanded it to enforce medication. How would our robot know where to start and where to stop? Would our software lock the refrigerator if we're on a strict diet? Would it turn off the phone and Internet to prevent us from ordering a pizza? Monitor our toilet for signs of unplanned consumption?

In this context it's quite clear that no AI will ever be truly intelligent without some kind of ethical governance module because without it, the AI would likely miss the last few ethical pieces of the puzzle that humans would consider, and would therefore always fail when it matters most. Imagine an AI that drives your autonomous vehicle not knowing when it is and when it isn't OK to kill an animal that's on the road.

Yet even if we were to make robots intelligent in terms of learning and self-derived decision making, today they are still close to point zero in terms of emotional and social intelligence—two terms that are in themselves very hard to explain or even measure.

The issue of learning machines is one of my chief concerns when it comes to ethics. Deep learning is the area of AI that has seen the biggest investments since 2015¹⁹¹ and this is very likely to continue in the next few years. We are not going to see another AI winter, another period where investors will stop funding AI ventures because they over-promised and under-delivered.

Just imagine if (when?) infinitely powerful machines and supercomputers are able to learn how to solve pretty much any problem based only on a huge flow of live data, i.e. without any prior commands or programming. Google DeepMind's AlphaGo victory, discussed earlier, is a prime example of such learning capabilities in action.¹⁹²

With deep learning, powerful machines can discover the underlying soft rules, values, and principles, and could therefore understand and quite possibly even simulate them. However, if this is destined to become the next big thing in computing (as IBM likes to say, “cognitive computing”), we mere humans would have no way to gauge if the AI's recommendations are correct or not, because the machines' computational capabilities would dramatically exceed our own. A wicked problem indeed, if we invent machines that are several orders of magnitude beyond our own capabilities, with IQs of 50,000 and above, how do we know they can be trusted? And who can still supervise them? Would they eventually become sentient in some new way? Should we embed a set of desirable human ethics in them, and how would that even be possible?

In his 1987 *AI* magazine article “A Question of Responsibility,” Mitchell Waldrop wrote:

One thing that is apparent . . . is that intelligent machines will embody values, assumptions, and purposes, whether their

programmers consciously intend them to or not. Thus, as computers and robots become more and more intelligent, it becomes imperative that we think carefully and explicitly about what those built-in values are.¹⁹³

This issue has even more relevance as we enter the exponential era because we must now consider what the ethical frameworks should be for all exponential technologies including AI, geo-engineering, cognitive computing, and of course, human genome editing in particular. This includes both the frameworks that are (in)advertently programmed into machines by their human inventors or builders, as well as those that machines may themselves learn and evolve over time.

If IBM's Watson is a true thinking machine, how will it deal with human parameters and values that are unclear, ambiguous, or unspoken even between humans? Will these AI ethics be hard-wired through pre-programming or evolved and adapted using deep learning neural networks that seek to mimic how the brain acquires new information? And if they are self-learning, how will humans be able to verify, control, and adjust them? How would these systems cater to the myriad cultural permutations of human ethics?

The deeper scientific questions about AI and deep learning, such as the technical feasibility of controlling such new intelligences, are beyond the scope of this author and this book, for now, but in any case, it's obvious that a humongous task lies ahead of us. Indeed, in the very near future, the role of a digital ethicist may well become one of the most sought-after jobs along with data scientist. Maybe this is a good job for your kids, as well . . . ?

And no religion, too. . . ?

It is also very important to remind ourselves that ethics are not at all the same as religion. In his enlightening 2011 book *Beyond Religion*, the Dalai Lama remarked that everybody has ethics and only some people have religion, and then called for the establishment of global secular ethics to guide our most elemental decisions such as those on

autonomous weapons systems with the power to kill without human supervision.¹⁹⁴ Ethics versus religion is an essential distinction we need to maintain when discussing hot-button topics such as human genome editing or nonbiological augmentations of humans. I suggest that we should avoid bringing religion into these debates as much as we can because religious views are not nearly as uniform and ubiquitous as the most basic ethics and values, and because they are front-loaded with too much history and past experiences.

Arthur C. Clarke highlighted this critical distinction in a 1999 interview:

So now people assume that religion and morality have a necessary connection. But the basis of morality is really very simple and doesn't require religion at all.¹⁹⁵

Creating a Global Digital Ethics Council: How would we define ethics that are fit for the exponential age?

I would like to address two main concerns: Firstly, to try and define what a globally agreeable set of ethics could be for an exponentially Digital Age; and secondly, to try and define what we would need to do to ensure that human well-being and ethical concerns actually remain on top of the agenda globally, and are not taken over by machine thinking.

We need to define a set of bottom-line digital ethics—ethics that are fit for the Digital Age: open enough not to put the brakes on progress or hamper innovation, yet strong enough to protect our humanness. A compass, not a map, towards a future that will see increasingly powerful technologies first empower, then augment and then increasingly threaten humanity.

To this end, I propose that we create a Global Digital Ethics Council (GDEC) tasked with defining what the ground rules and most basic and universal values of such a dramatically different, fully digitized society should be.

By and large at present we agree that no rogue states should have

nuclear capabilities even if they can afford them. This situation is indeed complex, fraught with lies and deception—and always changing—but the essential understanding remains, and is enforced because the alternative involves untold risk.

In the same way, we now need to agree on the limits and independent monitoring of both the scope and progress in future AI, genome editing, and other exponential technologies.

To kick-start this conversation, I have set out some straw man suggestions below. I know this is a daunting task, and yes, sure, it may even be presumptuous to try. But we need to get started, so I might as well get burned first!

To support the GDEC, we also need to set out a simple manifesto on digital ethics, a kind of global treaty on exponential human rights in an increasingly digital world. Such a manifesto and subsequent treaty could serve to guide and hold accountable those companies that invent, make, and sell these technologies (and their governments). This is really important because the implications of exponential technological change on human existence can no longer be treated as mere externalities, as a side effect that is of no immediate concern to those causing it.

The GDEC I envision would need to include well-informed and deep-thinking individuals from civil society, academia, government, business, and technology, as well as independent thinkers, writers, artists, and thought leaders. (This writer is happy to chime in!) It needs to be global from the outset, and might eventually need similar or even larger powers to those which UN Human Rights Special Rapporteurs have today—namely the right to monitor, advise, and publicly report issues and violations.¹⁹⁶

As used to be the case with sustainability, ethics are often a final, “nice to have” item on the agenda that can be bumped whenever something more urgent comes up. This is a fundamentally flawed and very dangerous approach to safeguarding our futures. As we move into an era where critical developments will happen gradually then suddenly, we simply won’t have the runway to consider our ethics at the point when they have already been irretrievably squashed by

thinking machines. “Wait and See” simply means human abdication.

A new moral calculus

We must spend as much time and resources on digital ethics as we spend on exponential technologies. Examining the unintended consequences of exponential technologies and preventing damage to humanity—going far beyond the existential risks—demands as much support as we are giving to the sciences now driving those changes. The human factor requires just as much funding and promotion as science—there can be no STEM (science, technology, engineering and mathematics) without its CORE (creativity, originality, reciprocity and empathy).

In his 2015 book *Machines of Loving Grace*, *New York Times* reporter John Markoff highlights the need for this new moral calculus:

Optimists hope that the potential abuses of our computer systems will be minimized if the application of artificial intelligence, genetic engineering, and robotics remains focused on humans rather than algorithms. But the tech industry has not had a track record that speaks to moral enlightenment. It would be truly remarkable if a Silicon Valley company rejected a profitable technology for ethical reasons. Today, decisions about implementing technology are made largely on the basis of profitability and efficiency. What is needed is a new moral calculus.¹⁹⁷

Five new human rights for the Digital Age

Here are five core human rights that I humbly suggest might form part of a future Digital Ethics Manifesto:

1. **The right to remain natural, i.e. biological** – We must have the choice to exist in an unaugmented state. We need to retain the right to be employed, use public services, buy things, and function in society without the need to deploy technology on or inside our bodies. These #WiredOrFired fears are already an

issue (albeit deemed mostly harmless) as far as mobile devices and social media are concerned. However, one can easily imagine a future where we may be forced to wear augmented reality (AR)/virtual reality (VR) glasses, visors, or helmets to qualify for employment, or even worse, be required to use or implant specific wetware apps as a condition of employment. Mere humans would no longer be good enough—and this isn't a desirable future.

2. **The right to be inefficient if and where it defines our basic humanness** – We must have the choice to be slower than technology. We should not make efficiency more important than humanity. It may soon be vastly more efficient and much cheaper to use digital health diagnostics via platforms like Scanadu than to see a doctor every time I have a medical issue. I believe these technologies are in the main positive and could be one of the keys to lowering the cost of healthcare. However, does this mean we should penalize people who choose to do otherwise, or force compliance upon those that don't want their health data in the cloud?
3. **The right to disconnect** – We must retain the right to switch off connectivity, to “go dark” on the network, and to pause communications, tracking, and monitoring. We can expect many employers and companies to make hyperconnectivity a default requirement in the near future. As an employee or insured driver you may become liable for unauthorized disconnection if you and/or your car can no longer be tracked on the network.

To be self-contained and technically disconnected at times of our own choosing is a fundamentally important right because disconnecting allows us to refocus on our unmediated environment and to be in the moment. It also reduces the risk of digital obesity (see chapter 7) and lessens the reach of inadvertent surveillance. Offline may be the new luxury, but it should remain a basic right.

4. **The right to be anonymous** – In this coming hyperconnected

world, we should still have the option of not being identified and tracked, such as when using a digital application or platform, or when commenting or criticizing if it's harmless to others and does not infringe on anyone else. Sure, there are some obvious occasions where real anonymity would be impossible and probably unreasonable to expect, such as in digital banking transactions. However, we should make sure that protected spaces remain, where complete tracking isn't required or the norm, such as when voicing political opinions, sharing personal pictures, or getting medical advice. Anonymity, mystery, serendipity, and mistakes are crucial human attributes we should not seek to remove by technological means.

5. The right to employ or involve people instead of machines

- We should not allow companies or employers to be disadvantaged if they choose to use people instead of machines, even if it's more expensive and less efficient. Instead we should provide tax credits to those that do, and consider automation taxes for companies that dramatically reduce the number of employees in favor of machines and software. Those taxes would need to be made available to retrain people that became the victims of technological unemployment.

It's important to note that many of these rights touch on an important issue at the core of this debate: How much freedom are we willing to sacrifice in order to be either more efficient or more secure? We also need to ask what the ethics of security should be, and how will technology deal with this crucial issue?

15 daring Shall Not's

In furtherance of developing and embedding clear and globally consistent digital ethics, here are some specific examples of technological pitfalls that we should avoid if we want humanity to prevail.

I am keenly aware that, in providing thought starters for the debate, some of these suggested commandments might turn out to

be overly simplified, idealistic, impractical, utopian, incomplete, and controversial. Hence, I am humbly presenting them simply in the spirit of starting a discussion.

1. We shall not require or plan for humans to gradually become technology themselves, just because that would satisfy technology or technology companies and/or stimulate growth.
2. We shall not allow humans to be governed or essentially directed by technologies such as AI, the IoT and robotics.
3. We shall not alter human nature by programming or manufacturing new creatures with the help of technology.
4. We shall not augment humans in order to achieve supernatural powers that would eliminate the clear distinction between man and machine.
5. We shall not empower machines to empower themselves, and thereby circumvent human control.
6. We shall not seek to replace trust with tracking in our communications and relationships just because technology makes this universally possible.
7. We shall not plan for, justify, or desire total surveillance because of a perceived need for total security.
8. We shall not allow bots, machines, platforms, or other intelligent technologies to take over essential democratic functions in our society which should actually be carried out by humans themselves.
9. We shall not seek to diminish or replace real-life human culture with algorithmic, augmented, or virtual simulations.
10. We shall not seek to minimize human flaws just to make a better fit with technology.
11. We shall not attempt to abolish mistakes, mystery, accidents, and chance by using technology to predict or prevent them, and we shall not strive to make everything explicit just because technology may make it feasible to do so.
12. We shall not create, engineer, or distribute any technology

- with the primary goal of generating addiction to it.
13. We shall not require robots to make moral decisions, or equip them to challenge our decisions.
 14. We shall not demand or stipulate that humans should also be exponential in nature.
 15. We shall not confuse a clean algorithm for an accurate picture of human reality (“software is cheating the world”), and we shall not give undue power to technology because it generates economic benefits.

On the particular issue of everything becoming explicit, social networks are teaching us a good lesson: Things that used to be unspoken—living between the lines—have subtly become the focus of attention, announced very clearly, and amplified by groupthink. While my endorsement of a given civil rights group, a political organization, or a social cause may have been explicit in the past, the information was not widely available to everyone. Now that everything is connected, my every comment can be seen instantly, examined, and aggregated by everyone.

We must not pursue efficiency over humanity

Exponential technologies are quickly making everything around us increasingly more efficient. As a result, everything is becoming a service, everything is in the cloud, and everything is now smart. Even the dumbest piece of hardware will have sensors, contributing to a global tsunami of data that, paired with AI, may hold the solution to pretty much any problem.¹⁹⁸

Let’s imagine what such a world could look like by 2030. When literally everything is tracked, measured, and hyper-efficient, what will happen to things that cannot be quantified as easily? What will we do about emotions, surprise, hesitation, uncertainty, contemplation, mystery, mistakes, accidents, serendipity, and other distinct human traits? Would they become undesirable because algorithms and machines are perfect, programmed not to make mistakes, work 24/7/365, don’t have unions, and by and large will do as they are told?

(Well, at least the non-thinking kind will...).

Will increasing technological progress mean that humans who exhibit too many of these non-machine-readable traits will be considered a waste of time, or worse, be treated like sand in the gearbox of big efficiency?

Will we increasingly adapt and change our behavior, so we can appear to be more efficient, or at least pretend to be? Will the idea of total efficiency become the great equalizer forcing us to behave more uniformly? Will the obsession with technology and its absolute efficiency and consistency eventually overrule the tacit acceptance of human inefficiency and difference? This often seems likely to me, even if it may take longer here in Europe—and even longer than that here in Switzerland!

If reaching the highest possible efficiency will remain a primary concern, then skyrocketing machine performance in the exponential age means we would probably not have any human involvement in anything at all, before long. Moving from four to 128 on the technology scale in the next decade or so suggests that many tasks could be 32 times faster than today. Can you imagine retail, banking, and transportation becoming 32 times as efficient as today? Would they be 32 times cheaper as well, and if so, what would that mean for our economy?

We will need to be very careful when making decisions based purely on efficiency that will almost certainly cost human jobs, remove human authority, or otherwise cause humans to automate, assignate, and abdicate (see chapter 4).

In many cases we may need to live with those dreaded inefficiencies, and accept that they are simply a part of human life, even if they create obstacles to automation. The alternative would be to enforce efficiency ruthlessly, and do away with those who don't comply: If you want to see your doctor in person rather than use the remote diagnosis device, you will pay a penalty. Not having your car tracked at all times will mean you'll lose your insurance coverage. Not accepting a chip implant means you cannot work in this company.

The medical sector offers some useful precedents here for the debates

that are yet to come. Some people have long argued that caesarians are more efficient than natural childbirths, and therefore we should forego that privilege altogether—a clear case of putting efficiency over humanity.¹⁹⁹ Witnessing the exponential power of technology, I have a hunch where this might be going next: exogenesis—pregnancy outside the womb, babies born in labs.

Would it be efficient to track your car or any other means of transportation 100% of the time, on every parameter such as speed, direction, acceleration, interior temperature, and exterior air quality? The answer is yes. But would it also serve a human-worthy purpose? In many ways the answer is also yes: Using autonomous vehicles and analyzing tracking data could help to reduce pollution significantly, and put an end to most accidents. But in many other ways, constant tracking would be detrimental as well because it would be the most perfect surveillance tool ever invented, and would force us to act in a compliant manner at all times.

We urgently need to ask ourselves if we really want to replace our innate human sensibilities and capabilities with the promise of perfect machine functionalities, and gradually chisel away at the very meaning of being human. We may end up making things ultra-efficient, but we would be robbing ourselves of all purpose.

What if only the wealthiest 2% get access to new genetic treatments that promise dramatic life extension and longevity, while everyone else is locked out? Would we see even more civil unrest and terrorism due to even deeper inequality—driven by exponential technological gains? Just imagine what would happen if such a “DNA-fix” for aging emerges, but only millionaires could afford the treatment to live to 150, while everyone else died more or less as usual. It seems clear that our current ethical paradigms, under pressure from business-as-usual capitalism and stock market expectations, have no answer for these dilemmas.

Life beyond the algorithm

So what can we do about technology taking over where it should not? How can we protect ourselves from merely becoming the objects of

bot-fueled hyper-efficiency, feeding a giant AI that in turn dictates our lives and tells us what we can no longer do?

We need to ask if we're doing something because it's inefficient for machines or because it's positive for human users, and we need to ask this question a lot more often. We need to ask this question when voting for new laws, when starting a business, and when we give our money to technology companies. Voting with our wallets is a powerful tool that consumers have not used enough where digital ethics are concerned. Ironically, with technology, that right will become ever easier to exercise.

The ethical question, the issue of purpose and meaning, must come before the question of feasibility and cost. Going forward, the primary question in technology won't be about if something can be done, but why, when, where and by whom it should be done.

Another response may just be to say no, to refuse participation more often, to reject technologies and processes, apps, and software that are clearly not fit for human use but would simply amplify the power of algorithms. Maybe we should devise a health warning sticker or stamp like we have on cigarette boxes today, telling us that this program, app, or device "is certain not to further human happiness."

While efficiency and increased profit is sometimes a worthwhile goal, and ultimately one of the cornerstones of capitalism, we should not use technology to further a shortcut/wormhole-belief that purports efficiency alone to be the most important and worthy and human goal. This is machine thinking that won't serve us in the long term.

About The Author

Listed by *Wired Magazine* as one of the top 100 most influential people in Europe (2015), Gerd Leonhard's work focusses on the future of humanity and technology, digital transformation, big data, automation, AI and robotics, media, content, marketing and advertising, telecommunications, culture and tourism, banking and financial services, government and leadership. In his keynotes, presentations, workshops and advisory sessions Gerd often addresses topics such as digital darwinism and the challenges of digital transformation, the redefinition of human-machine relationships, the future of work and jobs, privacy in the era of big data, the sharing economy, and many more. His presentations are renowned for a hard-hitting and provocative yet inspiring, humorous and motivating style.

Gerd is a much sought-after speaker, having presented at more than 1500 events in 50+ countries since 2005. His list of clients include Google, Sony, UBS, Mastercard, Unilever, Lloyds Bank, WWF, Nokia, *The Guardian*, Telkom Indonesia, Siemens, RTL, ITV, BBC, France Telecom, Orange, Deutsche Telekom, MTN, *The Financial Times*, DDB, Ogilvy, Omnicom, The EU Commission, Mandarin Oriental Hotel Group, VISA, and many others. He resides in Zürich, Switzerland.

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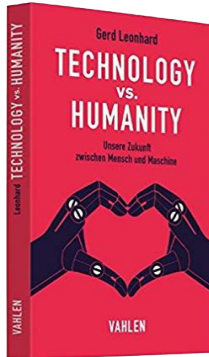
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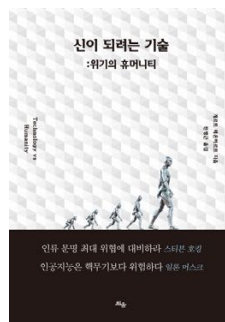
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