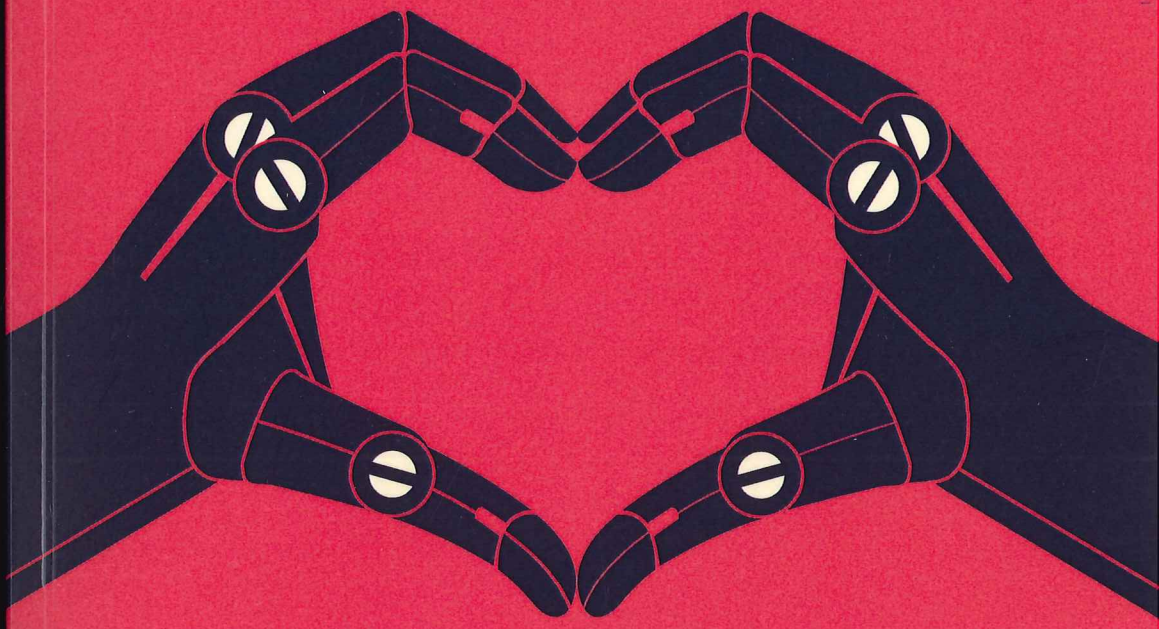
FutureScapes

TECHNOLOGY vs. HUMANITY



The coming clash between man and machine

Gerd Leonhard

Which side are you on?
Gerd Leonhard's provocative new manifesto

Futurist Gerd Leonhard breaks new ground again by bringing together mankind's urge to upgrade and automate everything - down to human biology itself - with our timeless quest for freedom and happiness.

Before it's too late, we must stop and ask the big questions: How do we embrace technology without becoming it? When it happens - gradually, then suddenly - the machine era will create the greatest watershed in human life on Earth. *Technology vs. Humanity* is one of the last moral maps we'll get as humanity enters the Jurassic Park of Big Tech.

Artificial intelligence. Cognitive computing. The Singularity. Digital obesity. Printed food. The Internet of Things. The death of privacy. The end of work-as-we-know-it, and radical longevity: the imminent clash between technology and humanity is already rushing towards us. What moral values are you prepared to stand up for - before *being human* alters its meaning forever?

Gerd Leonhard is a new kind of futurist schooled in the humanities as much as in technology. In his most provocative book to date, he explores the exponential changes swamping our societies, providing rich insights and deep wisdom for business leaders, professionals and anyone with decisions to make in this new era.

If you take being human for granted, press Reset now with this passionately argued call to create a genuinely braver new world.

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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 combinatory, 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

Chapter 1
A Prologue to the Future

Humanity will change more in the next 20 years than in the previous 300 years.

Human beings have a habit of extrapolating the future from the present, or even the past. The assumption is that whatever worked well for us up to now should, in some slightly improved shape or form, also serve us nicely in the future. Yet the new reality is that, because of the increased impact of exponential and combinatorial technological changes, the future is actually very unlikely to be an extension of the present. Rather, it is certain to be utterly different—because the assumption framework and the underlying logic have changed.

Therefore, in my work as a futurist I try to intuit, imagine, and immerse myself in the near future (five to eight years out), present views from that world, and then work my way back to the present from there rather than towards it.

Starting with a report from that near future, this book goes on to explore the challenges and lay out a manifesto, a passionate call to stop and think before we all get swept up in the magic vortex of technology, and eventually become fundamentally less rather than more human. This is a good time to remember that the future does not just happen to us—it is created by us, every day, and we will be held responsible for the decisions we make at this very moment.

Chapter 2
Tech vs. Us

Let's stop and consider our humanity for a moment.

A human being's cognitive ability is, among many other things, based on our genetic dispositions and approximately 100 billion neurons in our brain.

If all were simultaneously improved by technology, simply in terms of performance or connectivity, it might soon be possible to achieve, very roughly, about 100 standard deviations of improvement. This would give the average human an IQ of over 1,000 compared to the average range of between 70 and 130 that covers roughly 95% of the population.[24]

It is hard to comprehend what capabilities that level of intelligence would represent, but it would surely be far beyond anything we have witnessed or could imagine. Cognitive engineering, via direct edits to embryonic human DNA, could eventually produce individuals whose cognitive ability exceeds even the most remarkable of human intellects throughout history. By 2050, this process will likely have begun. Revamping a machine's operating system is one thing, but what does it mean to reprogram a sentient being with memories and a sense of free will (assuming that this will still matter in 2050)?

Let's start by looking at what defines being human. Countless philosophers have struggled with this question, but now that we are reaching the point when technology is gearing up to allow us to augment, alter, reprogram, or even redesign humans, this is now a

Chapter 3
The Megashifts

Technological shifts are rewiring society and transforming the landscape.

I believe the coming clash between man and machine will be intensified and exponentalized through the combinatorial effects of ten great shifts—Megashifts, if you will, namely:

1. Digitization
2. Mobilization
3. Screenification
4. Disintermediation
5. Transformation
6. Intelligization
7. Automation
8. Virtualization
9. Anticipation
10. Robotization

As a paradigm change is to thinking and philosophy, so a Megashift represents a huge evolutionary step for society, one that may seem gradual at first . . . but then has a very sudden impact. Below I explore the nature of these Megashifts and then go on to describe each of them and their potential implications.

Chapter 4
Automating Society

Higher productivity, better margins but fewer jobs, more techno-billionaires but a shrinking middle class?

Of all the Megashifts, automation merits particular attention. Automation has been a strong driver of change throughout history, for example when hand-operated looms made way for new weaving machines, causing the resulting 1811–1816 UK uprisings by the so-called Luddites who feared for their livelihood because of technology.[71]

Historically, the benefits of automation often resulted in many new opportunities for those initially disturbed or replaced by it. Markets became more efficient, costs fell, industries and economies grew, new sectors were born, and over time, the industrial society did not really suffer sustained long-term technological unemployment because of new technologies or automation.[72] With each wave of industrialization, new technology enabled new sectors and eventually created enough new jobs to replace those old jobs which it had made redundant. Wages also increased along with productivity—at least until the Internet came along!

Fast forward to the information economy—now a truly ancient-sounding term used to describe the first wave of the Internet—and the relationship between technological gains and job creation took a different turn. Inequality increased in major economies—led by the US—as those that owned the means and platforms of digitization

End of the Human Era[95]

So how do we draw the boundaries of automation and what might be considered a step too far into the wormhole? To get the conversation started, here are some examples of what I believe should and could be automated:

- Bookkeeping, filing, and financial administration
- Airport security
- Diary management—scheduling appointments and meetings
- Other routine tasks that don't involve human decision making

Activities that I think should not be automated (assuming that we could) may include:

- Public news and media
- Messages to one's personal connections
- Likes and affirmations on social media
- Friendship (as in Twitter auto-follow)
- Hiring or firing people
- Partner selection and forming of relationships
- Democracy (as in signing online petitions in lieu of political activities)
- Human genome alteration
- Giving birth

As a reminder, the textbook definition of "to automate" is to literally "act of oneself, to act unadvisedly."[96] Clearly, there are numerous tasks, actions, and activities where automation brings value and benefit to all. Then there are those automations that bring benefit to many, those that benefit a tiny few, and finally those that disadvantage practically everyone in the long run. In *The Time Machine*, H.G. Wells imagined a future starkly divided between feral Morlocks and ineffectual but elite Eloi.[97] Even if we all escape the way of the Morlock, how sovereign or heroic will we feel as Eloi—as passive meatware with titular mastery?

Chapter 5
The Internet of Inhuman Things

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 discussed previously, a combination of technological developments is fueling the emergence of the Internet of Things (IoT)—also described by Cisco as the Internet of Everything and by others like GE as the Industrial Internet.

The promise is simple: When everything is connected and data is being collected everywhere, all the time, we will be able to discover new truths and even predict and prevent events. Privacy and security expert Bruce Schneier calls this artificial brain-in-the-cloud of interconnected devices, sensors, hardware, and processes the "World-Sized Web."[98] Indeed, it may well deliver a new era of optimization and hyper-efficiency, but what will happen to human interactions?

The IoT promises enormous cost savings through a future of greater sustainability in a circular economy where all resources are reused, repaired, or recycled after initial consumption, and waste is effectively eliminated.[99] The IoT is enabled by embedding sensors in every object and connecting virtually everyone and everything. Then, by deploying artificial intelligence (AI) and predictive analytics, the idea is to achieve a meta-intelligence through an exponentially better

Chapter 6
Magic to Manic to Toxic

As we rave through the all-night honeymoon party that is tech, it's salutary to think about the price to be paid tomorrow, and forever.

Back in 1961, one of the godfathers of futurism and a great influence on my own work, Arthur C. Clarke, famously said, "Any sufficiently advanced technology is indistinguishable from magic."[104] Today, as highlighted in the previous chapters, we are beginning to see what Clarke envisaged with this prescient statement: We are in the midst of a veritable magic explosion; science and technology are delivering advances beyond our wildest imagination.

The magical effects of technology have become a big deal, commercially, economically, and socially, powering the meteoric rise and stock market success of companies such as Google, Apple, Facebook, Amazon, Baidu, Tencent, and Alibaba. Technological magic is also the driver and key enabler of predominantly US and Chinese unicorns and decacorns—disruptive companies such as Baidu, Dropbox, Uber, and Airbnb that are relatively recent arrivals on the scene.

When Google first launched in 1998, finding the perfect result to a search query on "cheap flights to London" was considered a kind of magic. So was being able to order almost any book, anywhere in the world, and have it arrive at your doorstep within a few days. The next wave of innovation saw the emergence of magical, legal, and very low-cost entertainment platforms such as Netflix, Hulu, ViaPlay,

Chapter 7
Digital Obesity: Our Latest Pandemic

As we wallow and pig out on a glut of news, updates, and algorithmically engineered information that may be anything but, we entertain ourselves in a burgeoning tech-bubble of questionable entertainment.

Obesity is a global issue, and, according to McKinsey, it's costing an estimated US$450 billion per year in the US alone, both in terms of healthcare costs and lost productivity.[130] The Centers for Disease Control and Prevention stated in 2015 that more than two-thirds of Americans are overweight, and an estimated 35.7% are obese.[131]

I believe we are reaching a similar or bigger challenge as we gorge on technology and bring on digital obesity.

I define digital obesity as a mental and technological condition in which data, information, media, and general digital connectedness are being accumulated to such an extent that they are certain to have a negative effect on health, well-being, happiness, and life in general.

Perhaps unsurprisingly, and despite those shocking health factoids, there is still little support globally for stricter regulation of the food industry to curb the use of addiction-building chemical additives, or to stop marketing campaigns that promote overconsumption. In America's never-ending war on drugs, harmful foodstuffs and sugars are never so much as hinted at. Just as organic foods now seem to be

Chapter 8
Precaution vs. Proaction

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 as "somebody else's business."

As technology's power increases exponentially, I believe it is critical to determine a sustainable balance between precaution and proaction. The former means looking proactively at what might happen—the possible consequences and unintended outcomes—before we proceed with a course of scientific exploration or technological development. In contrast, the proactionary approach advocates an attitude of moving ahead in the interest of progress before all the potential risks and ramifications are clear.

Should we restrain science, inventors, and entrepreneurs if the resulting inventions are likely to have a materially adverse impact on humanity? Absolutely. Should we stall or prohibit scientific leaps that might be mostly beneficial to society but would need regulation to achieve a balanced outcome? Absolutely not. Indeed, prohibiting such advances might not even be possible.

The answer, of course, will be in a wise and holistic balance between these two positions, once again requiring us to become better future stewards.

Let's explore both positions in more detail.

Initially born out of environmental considerations, the precautionary principle holds that those who create things with

Chapter 9
Taking the Happenstance out of Happiness

As big tech simulates quick hits of hedonistic pleasure, how can we protect the deeper forms of happiness that involve empathy, compassion, and consciousness?

Happiness: Good fortune or luck in life or in a particular affair; success, prosperity
Happenstance: A chance event; a coincidence
—*The Oxford English Dictionary*

Just what is happiness?

Throughout this book I argue that pursuit of maximum human happiness should be a primary purpose of technological progress. Striving for happiness is an essential component of being human—uniting us all. Just as we all have ethics (though not necessarily religion), the pursuit of happiness is a universal imperative shared by all humans, regardless of culture or belief system.

We are all engaged in the constant pursuit of happiness throughout our lives. Our daily decisions are driven by this impulse to create enjoyable or fulfilling experiences, whether indulging in momentary pleasure, delaying gratification in the service of a longer-term benefit, or pursuing higher fulfillment beyond the basic needs of food and shelter.

As we face the coming convergence of man and machine, I think

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,

Chapter 11
Earth 2030: Heaven or Hell?

While many of the seismic changes on the horizon are to be welcomed—like working for a passion rather than for a living—several 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?

As I write this in 2016, we are already at the point where much of what used to be considered science fiction is already becoming science fact.

We are already experiencing the science fiction and, sometimes, the adverse effects of the choices of previous generations: automated language translation, nearly autonomous cars, nanobots in your bloodstream, artificial intelligence (AI) that can wage cyber wars on our behalf, and refrigerators that talk to our smartphones—which in turn send our data to our doctors.

So, let's zoom forward to 2030, visualize plausible futures for a world reshaped by exponential technological change, and consider what some HellVen (#hellven) scenarios may look like. Presented below is a timeline of possible scenarios stretching out to 2030.

2020: Hyperconnectivity and hyper-manipulation

As everything is now hyperconnecting, all ten major global brains—formerly Internet platforms and media companies—use algorithms to measure and determine what I should see, when, and how.

Chapter 12
Decision Time

It's time to choose your team.

This book was inspired by the work of so many people that have expressed similar concerns, and I can only hope it will help shape a global debate on the purpose and ethics of technology—and the ethics of those who invent and provide it.

Humans and technology are increasingly overlapping, intersecting, or even converging—your choice of words depends very much on how you feel about that fact. In any case, as stated at the very beginning of this book, this much is certain: I believe humanity is likely to change more in the next 20 years than the previous 300 years.

The coming man-machine confluence will enable amazing wins for humanity and simultaneously threaten it. We must now become much better stewards of our inventions and their consequences if we are to flourish.

Yes, technological progress seems unstoppable because it's the nature of humans to conjure, test, and deploy our *techne* (our tools). Yet finally, we have reached the point where human-centric policies and standards, digital ethics, social contracts, and global agreements on humanizing these exponential technologies will be as important as nuclear nonproliferation treaties.

In the very near future, it will no longer be about whether technology can do something (the answer will almost always be yes) but whether it should do something—and why.

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Resources

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THE FUTURE OF BUSINESS - Critical insights to a rapidly changing world from 62 future thinkers

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The Future of Business highlights how - in a world of constant and ever-more fundamental change - those charged with leadership, management and stewardship of large and small organizations alike are faced with a set of questions many of us never thought we would have to confront. These questions are becoming more prominent and real as we develop a better understanding of, and feeling for, the disruptive potential of what's coming over the horizon.

The Future of Business explores the innovations driving our changing context. Throughout history, people have understood that tomorrow's business landscape will be shaped and influenced by the world around us. What is perhaps different today is the sheer speed at

which our world is being transformed by a convergence of science-led innovations and the ideas they enable. We are entering a fascinating period in our history, where science and the technologies it spawns, are now at the heart of the agenda.

The Future of Business is designed to provide wide ranging visions of future possibilities and take us on a tour of the forces shaping the political, economic, and social environment. We explore the advances in science and technology that could have the greatest impact on society and drive business disruption. We examine the implications of these for how business will need to evolve and the new industries that could emerge over the next two decades. We highlight key tools, approaches, and ways of thinking about the future that can help organizations embed foresight at the heart of the management model. We conclude with a framework that highlights key choices we face in shaping *The Future of Business.*

Available during 2017 from Fast Future Publishing

50:50 - Scenarios for the Next 50 Years

2016 saw the World Future Society celebrate its 50th birthday – marking 50 years of public dialogue about the forces shaping our world and the future scenarios we can envision and create.

Fast Future Publishing is taking this opportunity to explore scenarios for the next 50 years by publishing 50 perspectives on possible futures from 50 different future thinkers around the world.

The book is designed to have the broadest possible scope and is edited by global futurists Rohit Talwar, Steve Wells, April Koury and Alexandra Whittington. The book explores potential future scenarios over the next 50 years across a range of topic areas including:

- Macro perspectives on the future
- People and demographics
- Being human and the boundary between humans and machines
- Values, ethics and beliefs
- Civil society – education, healthcare, communities
- Leisure, entertainment, media and sport
- Government, economics and legal systems
- Peace, justice, security and conflict
- Travel and transport
- Energy and environment
- Industries of the future
- Business, work and jobs
- Science and technology – current, emerging and yet to be created

See www.fastfuturepublishing.com/5050 for more information.