

FUTURE NEWS

TO CONNECT, TO INFORM AND TO INSPIRE

IN THIS EDITION

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Why curiosity and collaboration are the critical skills of the future

by Rohit Talwar, Steve Wells and Alexandra Whittington



Steve Wells



Rohit Talwar,



Alexandra Whittington

It seems that whatever the country, whatever the economic context, one question is becoming ever more pertinent: what is the future of work in an era of exponential technology development?

Artificial intelligence is arguably the big game-changer and becoming more commonplace. We already see some AI in use in internet searches, customer targeting applications, and in predictive analytics. But AI has much greater capability, which will merge into every aspect of our lives in the future. Increasingly devices will learn more about us, provide an ever-increasing range of support and take on more of our tasks. We are automating a lot more activity in literally every sector and that is set to accelerate.

The goal for some – regarded as unappealing and potentially dangerous by others – is for AI to replicate human intelligence. That does create questions of the balance in society between human and machine. What are the ethical and control questions that need to be answered to ensure we harness the potential of AI in service of society and not just the technology corporations?

FUTURE OF BUSINESS

In our recent book on “The Future of Business”, we have identified 30 different trillion-dollar industry sectors of the future, which we grouped into clusters. We expect these clusters and the underlying sectors to be impacted radically by exponential technology developments:

- Information and communications
- Production and construction systems
- Citizen services and domestic infrastructure
- New societal infrastructure and services
- Transformation of accounting,

legal, and financial services

- Energy and environment

So, we can clearly see the significant disruptive potential that technology offers to emerging sectors and the new players within them.

The McKinsey Global Institute looked at which technologies will drive the economy of the future. It found that mobile internet, the automation of work knowledge, the internet of things (where many factory, office, and household devices and appliances are connected to the internet), and cloud computing would be the most significant creators of new economic value. McKinsey also singled out advanced robotics and autonomous vehicles as playing a significant part in future economic growth.

Given the importance of the issue, it is not surprising that there have been a number of research projects exploring what this scale of technological change means for the future of work.



Credit: Shutterstock Inc.



Credit: Chombosan/Shutterstock Inc.

In 2014 Pew Research posed the question: “Will networked, automated, AI and robotic devices have displaced more jobs than they have created by 2025?” Its key findings were:

- 48% of respondents said that robots and digital agents will displace significant numbers of blue-collar and white-collar workers
- Society would see increases in income inequality, significant numbers of unemployable people, and breakdowns in the social order
- Conversely, 52% said technology will not displace more jobs than it creates. Lost jobs would be offset by human ingenuity creating new occupations, and industries
- This group also pointed out that current social structures (eg education) are not adequately preparing people for the skills needed in the future job market.

US JOBS MOST VULNERABLE

A 2013 study on the Future of Employment by Carl Benedikt Frey and Michael Osborne of the Oxford Martin School explored the probability of computerisation for 702 occupations and asked which jobs are most vulnerable. The study found that 47% of workers in the US had jobs at high risk of potential automation. The most at-risk groups were transport and

logistics (taxi and delivery drivers), sales and services (cashiers, counter and rental clerks, telemarketers and accountants), and office support (receptionists and security guards). The equivalent at risk-workers were 35% of the workforce in the UK and 49% in Japan.

A PREMIUM ON SOCIAL SKILLS

The World Economic Forum’s study into The Future of Jobs last year estimated that 65% of children entering primary school today will work in job types that don’t yet exist, and that 3.5 times as many jobs could be lost to disruptive labour market changes in the period 2015–2020 than are created. While the study saw job losses in routine white-collar office functions it saw gains in computing, mathematics, architecture, and engineering-related fields.

The report identified a number of job categories and functions that are expected to become critically important by 2020:

- Data analysts – leveraging big data and AI
- Specialised sales representatives – commercialising and articulating new propositions
- Senior managers and leaders – to steer companies through the upcoming change and disruption

“By 2020, more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today,” the report concluded. “Social skills — such as persuasion, emotional intelligence and teaching others— will be in higher demand across industries than narrow technical skills, such as programming or equipment operation and control.”

Our view is that we could well see 80% or more of current jobs disappearing in the next 20 years. Some will become obsolete, others will be fully or partially automated and in many cases tasks will be redesigned to eliminate the need for human input and decision-making. The big question here is whether these jobs will be replaced by the combination of entrepreneurship, increased investment in education and training, human endeavour and the rise of the six sector clusters described above. While we don’t know the answer, there is a lot we can do today to prepare for possible disruption.

As individuals there are new skills we need to think about acquiring now to equip us for the world of work in the future. A new set of survival skills for the 21st century will include foresight, curiosity, sense-making, accelerated learning, with a tolerance of uncertainty, scenario-thinking, coping with complexity, and collaborative working.

Steve Wells, Alexandra Whittington and Rohit Talwar are from [Fast Future](#) which publishes books exploring how AI, robotics and disruptive thinking could impact individuals, society and business and create new trillion-dollar sectors.

Book Review

by Charles Brass – Chair, futures foundation

A line in Kris Kristofferson's most popular song (Me and Bobby McGee) asserts: "Freedom's just another word for nothing left to lose." Although Raoul Martinez doesn't quote this line in his book, he forensically examines the idea of freedom from every conceivable angle.

He begins by highlighting how much 'the language of freedom pervades our lives, framing the most urgent issues of our time, and the deepest questions about who we are and who we wish to be (pix).' He argues 'we may well be less free than we like to think, but only through understanding the freedom we lack can we enhance the freedom we possess.'

Martinez challenges his readers to use the prism of freedom to question our assumptions about the way our world works. His first chapter is one of the most confronting few pages this reviewer has ever read. It begins by pointing out that none of us chose to exist. We didn't choose our bodies or our brains or, for that matter, the environment into which we were born. He argues: "the knowledge we possess, the beliefs we hold, the tastes we develop, the traditions we adopt, the opportunities we enjoy, the work we do – the very lives we lead – depend entirely on our biological inheritance and the environment to which we are exposed (p3)."

And therefore, he asserts, we are not responsible for the things we do!!!!!!!!!!!!!!

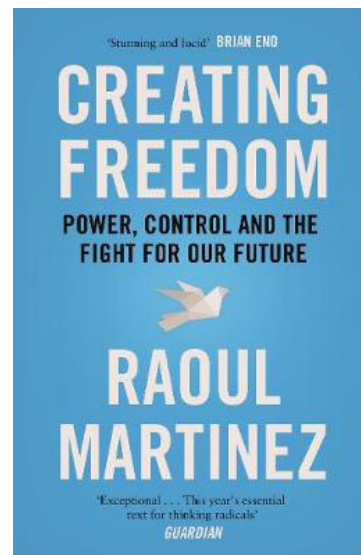
Martinez acknowledges that this assertion challenges many assumptions we make about our place (and the place of others) in the world. He says: "It can be hard to reconcile the fact that we are not truly responsible for the lives we lead with the countless decisions we make every day – what to eat, what to wear, whether to lie or tell the truth, whether to stand up for ourselves or suffer in silence (p4)." But, he says: "the act of making a choice does little to confer responsibility. The reason for this is simple, we *make choices with a brain we didn't choose* (p4 – emphasis in original)."

Essentially, Martinez argues, our choices are a matter of luck – our biological and environmental inheritances are all a matter of luck. It takes him nearly 30 pages to make this argument and, as I have already said, I struggled with it the whole way. I found it very hard to give up the idea (Martinez says the 'illusion') that I am not responsible for my actions, let alone accept that others are not responsible for theirs.

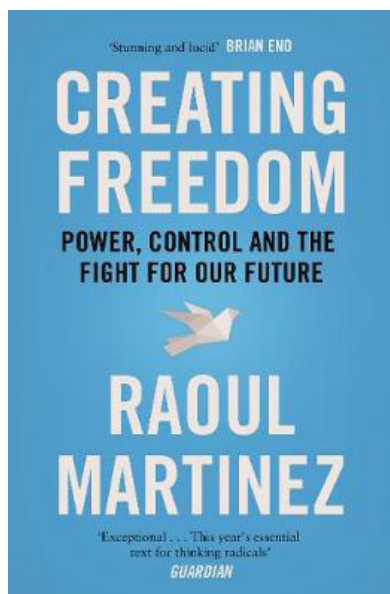
But it is worth persevering.

After setting out this argument in Chapter 1, Martinez devotes the next two chapters to consequentially questioning our attitudes to reward and punishment, both of which are fundamentally premised on the notion of responsibility. He argues very persuasively that both punishing people for doing bad things and rewarding them

**Creating Freedom
Power, control and the fight
for our future**
by Raoul Martinez



for doing good things are flawed approaches to managing our relationships with each other. With respect to punishment he argues, for example, that: "In a rational criminal justice system, the justification for punishment would derive solely from the positive effect it has on society, not from notions of blame or desert (p34)." With regard to reward he argues: "since we are not truly responsible for what we do, it does not make sense to distribute 'rewards' on the basis of behaviour. It does not make sense to apportion rewards at all (p66)." "For a principle of distribution to satisfy the test of fairness, it has to be based on need. In a world that took a principle of fair distribution seriously, sickness would be reason enough to be treated, hunger would be reason enough to be fed, and homelessness reason enough to be housed (p67)."



It is in this last quote that we get close to the main argument of the book – that the concept of freedom has been used (and abused) by those in power to perpetuate an egregiously unequal world. The second part of the book suggests that, in the name of freedom, most of us appear to have consented to be part of economic and political systems that have, in fact, seriously constrained our own freedom.

Martinez examines three purported freedoms in his next three chapters – free elections, free markets and free media and concludes that all are illusions. Even in the so-called free world the choice of candidates facing voters has been manipulated by powerful forces. Electoral systems themselves either favour two strong parties (as in the US, UK and Australia) or result in fragmentary short-lived governments (as is the case in much of Europe). Political parties and candidates need to be independently wealthy just to participate in the process (it is estimated that the cost of a seat in the US Congress is \$1.5million).

With regard to markets, he agrees with many other commentators both that they are never really free and that the closer they approach true freedom the more dysfunctional they become. “A completely free market does not exist. As economist Ha-Joon Chang points out, ‘Every market has some rules and boundaries that restrict freedom of choice. A market looks free only because we so unconditionally accept its underlying restrictions that we fail to see them’ (p148).” It is because power is so unequal that markets can never really be free (“...the right of the wealthy to their profits takes precedence over the right of the poor to survive (p163).”

Power is also the lens through which Martinez examines the media. Much of his analysis of the history of the media was new to me, but his conclusion that the cost of entry into mass media is so high as to make it inevitably oligopolic is not now. To counter this, much has recently been made about the impact of the internet on this cost of entry, but Martinez argues: “Just as in the offline world, whether the web is used to inform, manipulate, control, or liberate ultimately depends on how vigorously people fight the encroachments of state and corporate power (p209).”

The third part of the book is called ‘The fight for our freedom’, and is a call for what Martinez calls ‘creative freedom’ which he explains as follows: “What makes us free is not the power to choose, but the power to turn out choices into expressions of our own values, our lives into testaments to our own visions.

We expand our freedom when we transform the power to choose into the power to create, when we identify the things that matter to us, and dedicate ourselves to them (p216).”

This passage comes early in this section and much of the rest of its 170 pages is devoted to critiquing the economic and political systems that currently dominate our world. Martinez’ take on these systems can neatly be summarised by his approving of Naomi Klein’s claim that ‘our economic model is at war with life on earth (p327).’ While I found much to agree with in Martinez’ analysis of current power structures, he doesn’t have much more to say about what it might mean to actually create freedom, which was a disappointment. Martinez has produced a documentary on this theme which I have not seen, and perhaps the process of actually generating creative freedom is further explored there, but it is largely missing in this book.

Ultimately my conclusion is that Martinez is worth reading if for no other reason than he is one of a growing number of serious commentators (he describes himself as a philosopher, artist and filmmaker) who are writing books designed to convince the rest of us that our current economic systems are not capable of taking all of humanity into a future in which we will actually thrive.



Willow Prior

One of the key benefits of strategic foresight is its ability to support organisations and leaders to shift from a risk to an opportunity mindset. By [challenging business as usual](#), new possible futures can emerge, and with that can come new opportunities.

The old strategy “to do” list won’t provide you with the competitive edge that is required in the times of unprecedented change that we are experiencing. The practices that created success yesterday won’t necessarily create success today. This is really highlighted in Professor Sohail Inayatullah’s [article](#) about being in the midst of dramatic changes where a CEO says, “we had the perfect strategy for yesterday’s future.” In today’s fast paced world we are being called to step off the hamster wheel and re-ignite our capacity to shape the world. In other words, to move from being reaction-focussed to opportunities-focussed. To do this we need to unlock the futurist’s mindset and use strategic foresight tools that enable us to anticipate the future and challenge our actions today.

Here are 4 things you need to consider when unlocking your futurist mindset and shifting from risk-focussed to opportunity-focussed:

FUTURISTS IN ACTION

Identifying Business Opportunities with Strategic Foresight

by Willow Prior

Identifying business opportunities with strategic foresight

1. Understand why critical thinking is essential for shaping the future

While it is our worldview and mindsets that can enable us to see new opportunities where they didn’t exist previously, it is our deeply held beliefs, attitudes and assumptions that underpin them that can both create our preferred future or derail it. Ask yourself, “what are the assumptions I hold about the way I think we need to do business?”

If you want to better understand why critical thinking is fundamental for shaping the future, you can read the whole article [here](#).

2. Know your landscape

Strategic foresight is not so much about predicting the future as it is about anticipating it. Use your future insights as an asset that can inform your decisions today. Start by identifying key emerging issues and trends as part of your horizon scanning process to identify the landscape that lies ahead. You can then follow this with scenario planning to further reveal alternative futures and opportunities.

3. The power of humility

I’ve recently developed a crush on the incredible historian Yuval Noah Harari. Why you ask? I listened to his powerful presentation titled “[Will the Future be Human](#)” and I was inspired by his ability, when asked questions at the end, to say, “I don’t know the answer but I think we need to

start discussing this.” When we challenge the status quo a space emerges and it is OK not to know. It is from this very space that new opportunities can emerge.

4. Diversity of thinking

Breaking down the silos across teams and departments can create a diversity of thinking that supports the emergence of new solutions that have not previously been thought of. Foresight practices can provide the platform for this diversity of thinking and cross-pollination by creating a shared language and understanding of how future trends can impact your organisation or sector.

The bottom line

So, if you want to become opportunity-focussed instead of reacting to the environment and becoming trapped in the “old ways of doing business,” consider this. Understand why critical thinking is an absolute must, and start implementing it in your thinking. Then make sure to study what the landscape looks like and be humble in the face of uncertainty. And lastly, break down silos and foster a culture of diverse thinking. That way, you can create a shared vision of the future and find the best ways to shape it.

Willow Pryor, MSF (strategic foresight), is a professional futurist with a focus on consulting, facilitation of futures thinking workshops, speaking and teaching strategic foresight to enable the creation of alternative futures. Willow has worked with a range of public, private and for purpose organisations. She believes to create more equitable and sustainable futures our leaders, young and old, need to think like futurists. To get in contact with Willow email her on willow@facilitatingfutures.com

Signals in the Noise

100,000 NEW MICRO INDUSTRIES TO BE CREATED OVER THE NEXT TWO DECADES

by Thomas Frey

Every major industry today was started as a micro industry. Everything from steel, to photography, oil, airlines, electricity, automobiles, pharmaceuticals, and search engines all worked their way into existence from a tiny starting point.

Many of the oldest ones like steel, automotive, and pharmaceuticals took centuries to grow into the massive global industries they are today. But those created with digital technologies like search engines and smart phones sprang to life in only a few years.

Countless businesses are already feeling the first waves of disruption as industry veterans are hoping to navigate the turbulent waters ahead. As always, it's much easier to visualize what goes away than what comes next.

In his 2006 book, *Long Tail*, author Chris Anderson said, "When the tools of production are available to everyone, everyone becomes a producer." While much of Anderson's thinking was focused on 3D printing and flying drones, virtually every emerging technology offers an innovative playground for makers, inventors, and startup junkies.

100,000 NEW MICRO INDUSTRIES

Over the coming two decades we will be witnessing an unprecedented wave of innovation and creativity driven by new tools of production. During this time we will see an explosion of over 100,000 new micro industries that will employ hundreds of millions of people.

As example, the global market for shoes is 21 billion annually. Within five years, 5% of these will fall into the category of smart shoes. That means in just a few years we will be producing over 1 billion smart shoes every year.

During that same time we'll begin seeing a new era of industrial grade scanners, 3D printers, thousands of new printable materials, and an equal number of new sensors and data collection devices.

This means that virtually anyone with a passion for shoes can launch their own micro footwear industry. Even carving out a tiny niche selling 2,500 smart shoes a year at \$200 each is enough to launch a sustainable half-million-dollar micro industry.

In the shoe industry alone, 10,000 startups selling 2,500 shoes a year will only amount to 25 million shoes in a 21-billion shoe marketplace. That's little more than a rounding error for the current industry.

With our evolving new pallet for shoe designers, we will likely see super niche markets for diabetic shoes, lacrosse

players, steel-toed occupations, hockey players, sailors, sleep apnea, mountain climbers, gymnasts, amputees, window washers, and organ players. There may even be special shoes for every known allergy, self-navigating shoes for the directionally impaired, dog shoes, cat shoes, and shocker shoes for correcting certain additions.

The smartest of smart shoes will even come to you when you call them by name.

Since it will soon become easy to summon a driverless car, it will no longer be necessary to own one, leaving the garage empty. An empty garage tends to be a magnet for all the junk that accumulates over time, but it also represents an opportunity, an opportunity to become something else. And this will lead to a number of possible micro industries.

One option is to remodel two and three-car garages into AirBNB rentals that you operate yourself, allowing you can make a tidy extra income on the side. Another option is to work with Marriott, Hyatt, or Wyndham and create a branded rental as part of the new distributed city experience they're working on.

An empty garage can also be rented as a startup space or creative space for painters, sculptors, inventors, or musicians. Much like a distributed hotel operation it can also be part of a distributed storage operation.

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88 EXAMPLES WITH OUR NEW TOOLS OF PRODUCTION

The following examples are intended to give you a creative launchpad for how to think about these emerging micro industries.

Every micro industry will be defined by a few key startups that define and demonstrate a functional business model and prove a specific market segment.

DRIVERLESS TECHNOLOGY

1. Speed dating – Random people enter a driverless vehicle and speed around while getting to know each other.
2. Mobile retail storefronts – As an owner of a mobile retail store, you write your own rules about store hours, location, products, and service offerings.
3. Mobile grocery stores – Niche food selection services such as bread shops, fruit shops, vegetable shops, etc.
4. Mobile banks – As branch banks disappear, mobile banks may very well take their place.
5. Mobile repair businesses – Our repair culture is set to go hi-tech with things like an Apple Genius Bar on wheels, IoT installations, hacker-proofing of houses, etc.
6. Mobile medical services – Urgent care on wheels.
7. Mobile conversation salons – Lonely people are always looking for a way to fit in. With mobile conversation salons, you sign up for whatever discussion topic you're interested in and the driverless RV will let you know how soon it can pick you up.
8. Mobile gaming teams – Gaming moves to a whole new level when 6-12 rowdy players team up in a mobile setting to play Destiny, Wolfenstein, Call of Duty, or Assassin's Creed. Much like flight attendants on an airplane, roving waitresses will offer an assortment of food, snacks, and cocktails to the participants.

Signals in the Noise

100,000 NEW MICRO INDUSTRIES TO BE CREATED OVER THE NEXT TWO DECADES

FLYING DRONES

As we move past the hobbyist era of flying drones we will witness an eruption of niche startups that will serve as the anchors for trailblazing new industries.

9. Real-time terrain modeling
10. Policing drones
11. Gaming drones
12. Security drones
13. News media drones
14. Mixed reality recording drones
15. Canary in a coalmine drones
16. Bird herding drones

GROUND-BASED DRONES

Most people tend to overlook the possibilities for the less sexy ground-based drones.

17. Night delivery drones – Delivery companies will be able to achieve a 10X increase in stops per hour based on off-hour delivery times.
18. Pizza prep, cook, and delivery drones
19. Drone delivery boxes – Large mailboxes for the package delivery industry.
20. Drone repair services – When drones break down in the field, they will require a mobile/drone repair service
21. Data collection drones
22. Invisible fence drones
23. Eyes-on-the-problem drones
24. Drone jousting matches

DRONE COMMAND CENTERS

As the drone industry matures, many organizations will transition from one-off drones to fleets of drones. These fleet of drones will require their own unique command center to manage the duties and tasks of these machines.

25. City command centers
26. Police command centers
27. University command centers
28. Farmers/agriculture command centers
29. Prison command centers
30. News station command center
31. Ski resort command center
32. Theme park command center

SENSOR TECHNOLOGY

Every year the MEMs and sensor industry finds new ways to detect different aspects of the world around us. These sensors give us insight into the overall quality of the environments around us.

33. Thermal inspection sensors
34. Mold monitoring sensors
35. Personal mood sensors
36. Hair health monitoring sensors
37. Sleep quality sensors
38. Smell sensors (periodic table of smells)
39. Harmful animal sensors
40. Impending danger sensors

Signals in the Noise

100,000 NEW MICRO INDUSTRIES TO BE CREATED OVER THE NEXT TWO DECADES

3D PRINTING

Over the coming decades we will find tens of thousands of ways to make micro improvements in all the materials, scanning, and printing processes associated with 3D printing.

41. Food printers
42. Ice printers
43. Select-your-ingredients candy bar printers
44. Shoe printers
45. Jewelry printers
46. Clothing printers
47. Purse printers
48. Pillow printers



CONTOUR CRAFTING

Large-scale 3D printing used in the construction industry is called contour crafting.

49. Gazebo printers
50. Stage printers
51. Bridge printers
52. House printers
53. Commercial building printers
54. Statue (sculpture) printers
55. Storage cube printers
56. Park bench printers

CRYPTOCURRENCY

Everything we do with money today will be reinvented in the emerging cryptocurrency era.

57. Crypto banks
58. Crypto insurance
59. Crypto loans
60. Crypto coaches and advisors
61. Crypto wealth managers
62. Crypto cops and fraud investigators
63. Crypto identity protection specialists
64. Crypto tax specialists

Signals in the Noise

100,000 NEW MICRO INDUSTRIES TO BE CREATED OVER THE NEXT TWO DECADES

VR-AR MIXED REALITY

The immersive and semi-immersive forms of engagement that takes place in mixed reality will begin to uncover thousands of seemingly little applications over the coming decades.

65. VR-AR therapy – Cure phobias, stress, anxiety, and traumatic experiences.

66. VR-AR education and training – Learn by doing, but with a teacher/coach to help guide you.

67. VR-AR news – Experience the news first hand.

68. VR-AR gaming – Thousands of new games will soon leverage the VR-AR experience.

69. VR-AR movies – Immerse yourself into the storytelling experience.

70. VR-AR haptic experiences – Feel the experience via sports, dangerous situations,

71. VR-AR vacations – Go there without being there.

72. VR-AR coaching – Having smart people looking over your shoulder.



ARTIFICIAL INTELLIGENCE

If we think of AI as a talent-enhancing tool, we can begin to imagine entire new industries surrounding the creative arts.

73. AI-enhanced songwriters

74. AI-enhanced sculptors

75. AI-enhanced writers

76. AI-enhanced architects

77. AI-enhanced VR storytellers

78. AI-enhanced swarmbot management systems

79. AI-enhanced puzzle-makers

80. AI-enhanced performance artists

Signals in the Noise

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BLOCKCHAIN

Most people have heard about blockchain in tandem with Bitcoin's rise as the flagship of cryptocurrencies. However, blockchain is more than just bitcoin, it's a method of tracking transactions using technology that could prove to be revolutionary.

81. Blockchain voting systems
82. Blockchain auditing systems
83. Blockchain quality assurance systems
84. Blockchain smart contracts
85. Blockchain supply chain management
86. Blockchain ethics management systems
87. Blockchain food tracking systems
88. Blockchain wealth management systems

FINAL THOUGHTS

Micro industries will range from manufacturing products, to collecting data, designing systems, advising, coaching, monitoring, building, disassembling, and reinventing business in unique and different ways.

With the help of thousands of collaborators, micro industries will spring to life around niches far too small for existing industries to care about. But it is in these minuscule advances that great opportunities take root.

A simple coffee mug can be redesigned in thousands of different ways. The same holds true for every toothbrush, piece of clothing, ink pen, lamp, chair, and hundreds of other frequently bought consumer products.

We are entering an unusually creative period of human history. Those who embrace change on a massive scale will be best equipped to flourish during the coming decades.

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