WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Global agenda

The Global Future Councils Vision for the World in 2030

Draft for discussion

From exploring global transformations to shaping a sustainable and inclusive future

Geneva, Switzerland 19 January 2018

Contents

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Preface

We are living at a crucial moment in history as we enter the age of the Fourth Industrial Revolution. Depending on the collective choices we make, these technological breakthroughs could give us the power to move into a world that is even more prosperous, while being more sustainable and more inclusive. Alternatively, we could end up in a world where our economic, political and social systems are more rigid, more unequal and more conflicted as recent political, economic and social fractures indicate.

The Network of Global Future Councils is guided by the premise that facing these challenges while realizing the opportunities enabled by breakthrough technologies demands more integrated thinking and a concerted effort to engage stakeholders from across society in discussions about the future. The network convenes more than 800 top thought leaders to challenge conventional thinking and develop new perspectives on how collaboration and new technologies could significantly reshape global systems for the better, providing input and a forward outlook to the Forum's institutional initiatives.

It is clear where the journey needs to take us: towards the more inclusive, equitable and sustainable world laid out in the 2030 Agenda for Sustainable Development. Achieving this goal will require bold actions and new partnerships that allow all parties to scale up and amplify their collective impact. At the same time, the world will not stand idle until 2030, and the Fourth Industrial Revolution is set to not only bring about new possibilities to leapfrog, but also accentuate persisting inequalities and generate political dynamics that may make it even more difficult to achieve progress on shared global objectives.

This document lays out the collective thinking of the Network of Global Future Councils. It represents an evolving document that will continue to be updated with relevant outcomes until the end of the current 2016-2018 term.

The world in 2030
Context

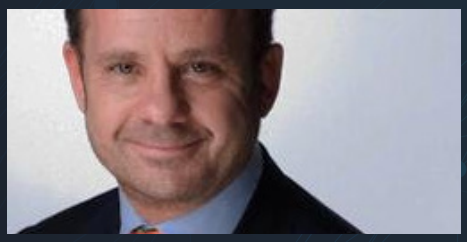
At the current rate of demographic, environmental and technological change, it is clear that, by 2030, the world will be a very different place. The global population is expected to grow to around 8.6 billion in the next 12 years and the pressure that this growth is putting on the Earth's natural resources and on socioeconomic systems is unprecedented.

Governance issues will become more pressing as we adopt new technologies, and regulators will have to guarantee protection without constraining innovation. Practical action is required to inspire public confidence in the capacity of technology to augment rather than become a substitute for human potential and economic opportunity.

Context

"People around the world are rejecting the technocratic, managerial approach to politics: there is a deep distrust and anger about political capture, manifesting in many different forms."

Diana Farrell, President and CEO, JPMorgan Chase Institute and co-chair of the Global Future Council on Economic Progress



"Rising costs combined with an ageing population and an increase in non-communicable diseases means that global healthcare needs to be fundamentally reinvented."

Andre Goy, Chairman and Director, Chief of Lymphoma, John Theurer Cancer Center, Hackensack University Medical Center and co-chair of the Global Future Council on Health and Healthcare

"There is a constant need to be reskilled. If you look at jobs in the marketplace today, you need some kind of renewal every five years or so."

Stephan Kasriel, CEO of Upwork and co-chair of the Global Future Council on Education, Gender and Work

8.6 billion world population by 2030 (UN, 2017)

A growing middle class and gains in empowerment will lead the demand for food to rise by **35** , water by **40%**, and energy by **50%** (World Economic Forum 2017)

Average life expectancy is set to increase in many countries by 2030 – and will exceed **90 years** in South Korea, according to new research. (Imperial College, 2017)

65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist.(McLeod, Scott and Karl Fisch, "Shift Happens", quoted in World Economic Forum 2016)

The middle class is set to grow by **160 million people** per year on average through 2030 (Brookings, 2017)

"Connected devices around the planet will sense a whole range of features to help us better understand and improve the world around us. Our ability to leverage this wealth of data will determine how much we can accomplish in the years ahead"

Victoria A. Espinel, President and CEO, BSA, The Software Alliance and co-chair of the Global Future Council on the Digital Economy and Society

"The low or even negative interest rate environment that we have will completely change the landscape; client behaviour and technology is changing; the new regulatory environment; these are all driving forces that will change the financial system"

Axel Lehmann, Chief Operating Officer of UBS Group and co-chair of the Global Future Council on Financial and Monetary Systems

"Manufacturing and production systems will be completely transformed by [...] a period characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres."

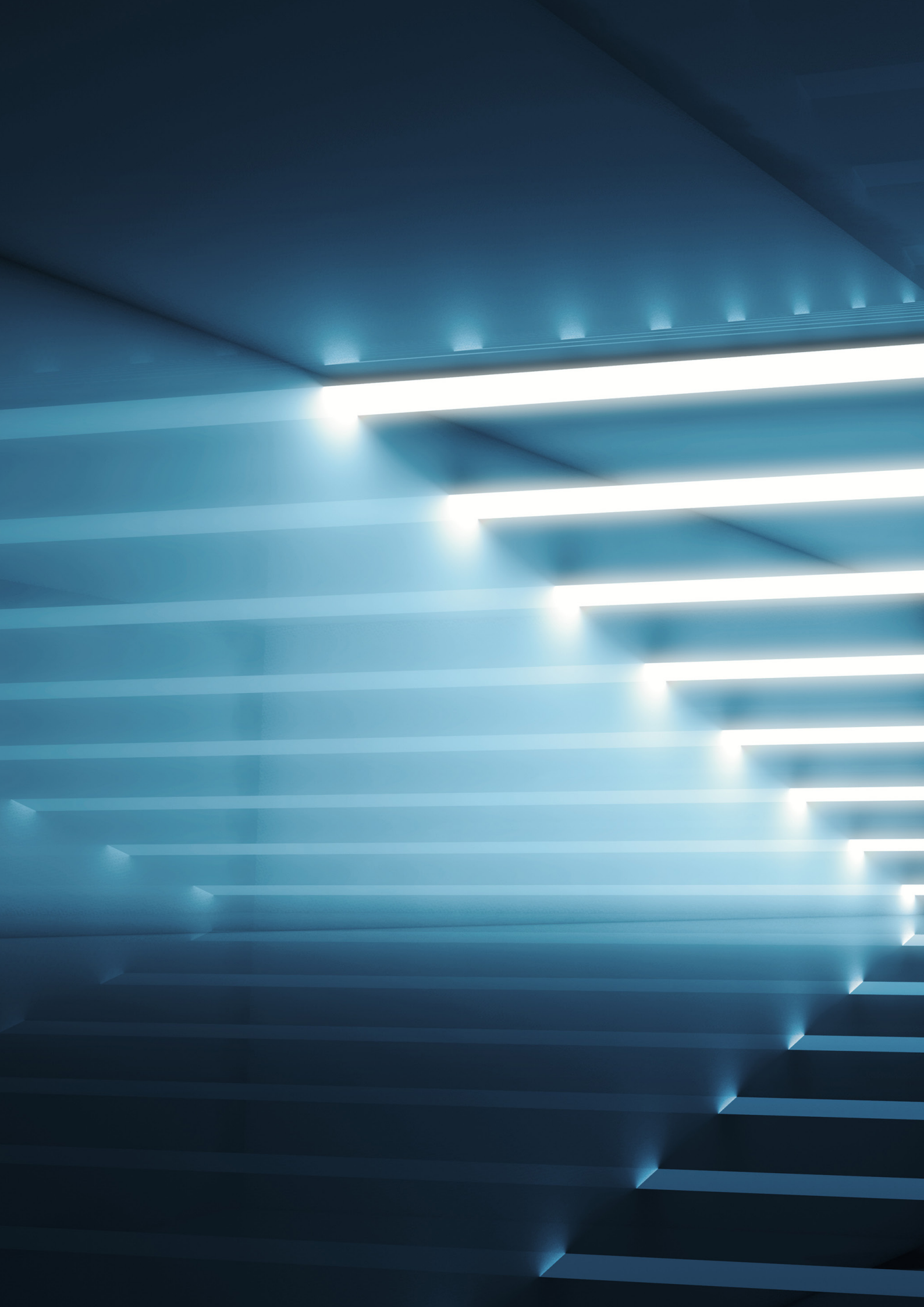
Subra Suresh, President, Nanyang Technological University (NTU) and co-chair of the Global Future Council on Production

By 2025, an average connected person anywhere in the world will interact with connected devices nearly **4,800 times per day** — basically one interaction every 18 seconds. (data age 2025)

By 2025 **nearly 20%** of the data in the global datasphere will be critical to our daily lives. (Data Age 2025)

By 2030, these would already have been mainstream for about **5 years** (World Economic Forum 2015)

- 10% of people wearing clothes connected to the internet
- 90% of people having unlimited and free (advertising-supported) storage
- 1 trillion sensors connected to the internet
- The first robotic pharmacist in the US
- 10% of reading glasses connected to the internet
- 80% of people with a digital presence on the internet
- The first 3D-printed car in production
- The first government to replace its census with big-data sources
- The first implantable mobile phone available commercially
- 5% of consumer products printed in 3D
- 90% of the population using smartphones



The world in 2030
Shaping the future we want

At the 2017 Annual Meeting of the Global Future Councils in Dubai and the follow up discussions, the 34 councils that comprise the Network articulated an initial set of common aspirations and recommendations with the objective to focus on areas where collaboration and new technologies could significantly reshape the world for the better.

Shaping the future we want
Resources

Opportunities for Transformative Change

We have taken great strides in decoupling socio-economic growth from the use of natural resources. Technology governance frameworks and innovative financing mechanisms have powered a sustainable revolution, which enhanced our ability to protect natural ecosystems and the Earth's natural capital.

- Consumers' and firms' behaviour and mindsets have significantly changed and are now driving sustainability.
- Circular economy is the pillar of production and consumption systems, and closed-loop material streams are the new norm.
- Trade policies and investment standards/approaches have fully internalized sustainability criteria at a systems level.
- Natural capital is a source of economic development for biodiversity-rich countries, as its value has been unlocked and protected by new technology developments and conservation conventions. The rights of citizens at a local level are also protected.

The transition to a greater decarbonization of the energy system has been achieved thanks to increased investments and exponential use of renewables, which increased energy access for all.

- New technologies have unlocked sources of information on energy consumption, enabling consumers and industrial users to reduce their use, while increasing their economic benefit.
- A global carbon-pricing system has been collectively defined and adopted, enabled by technologies such as blockchain for decentralized peer-to-peer carbon trading and Earth observation satellites for real-time transparency of emissions at their source.
- The large-scale adoption of digital technologies has made network operations flexible and increasingly efficient while allowing for a greater share of renewables in the energy mix.

The world population has access to sustainable, affordable and nutritious sources of food, allowing future generations to live prosperous and healthy lives. New models of consumption and emerging technologies have enabled us to create food systems that function as key stewards of the environment, providing nutritious options and creating economic opportunities for all.

- We eat healthier, safer and more sustainable food, and waste less.
- Technological innovation, combined with shifts in consumer and producer behaviour, has allowed us to reduce waste in production and consumption systems and to reduce natural resource inputs to the supply chains.
- Chemicals in production systems are better managed and have been redesigned to minimize impact on the ecosystem.
- Trust is at the core of the system, enabling the rollout of breakthrough technologies in food systems.
- Consumers have easy, reliable access to information on the environmental impact of food production and adapt their behaviour accordingly.
- A portfolio of protein sources has been embraced by consumers, reducing the environmental, health and social effects of previous protein delivery systems.

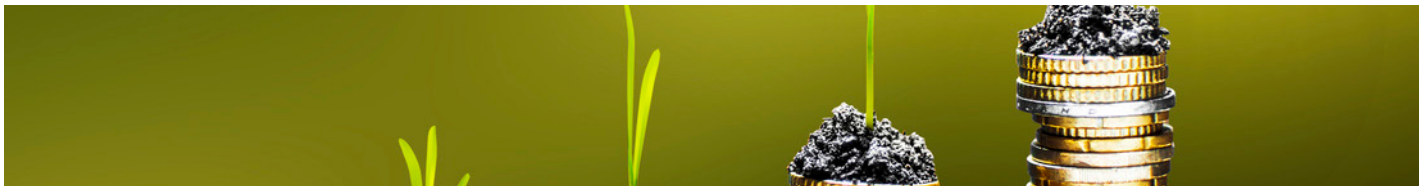
Ideas for Collective Action

Global panel on the economics of food systems
A holistic view of the economics of food systems (including health and environmental costs, and livelihoods value) is needed to strengthen the case for food-system transformation and to spur both policy change and public-private investment in food-system sustainability. A global panel of eminent and credible economists could be convened with environment, health and Fourth Industrial Revolution technology experts to develop the methodology with which the economics of food systems around the world can be measured.

Accelerating clean energy innovation
To accelerate clean-energy technology discovery such as the frontier of storage, we need to develop an integrated technology discovery platform that includes high-throughput technologies (computation, AI and robotics, blockchain, etc.). We also need to identify locations that can test new technologies and future policies in parallel, turning them into bigger integrated pilots. Each country should look into the creation of a "Silicon Valley for energy" and make successful examples visible to others. Finally, we need to develop a global, public-private, patient capital energy fund to create a bridge from early stage scientific discovery to VC-ready technology.

Fourth Industrial Revolution for traceability
Utilizing Fourth Industrial Revolution technologies such as Earth observation satellites, sensors and AI in combination with existing technology can help create transparent, traceable and tradable systems that support the conservation and restoration of the environmental commons. The technology community, including data providers, blockchain and AI experts should develop implementable solutions, which can then be coupled with government frameworks, standards and protocols that take into account privacy and ownership dimensions.

Are you interested in contributing to any of these ideas? Click on their respective titles



Further Analysis from the Global Future Councils

We don't need to consume less - we just need to design better products
From spider silk shoes to algae fuel, welcome to the new age of biotech
Where will our energy come from in 2030, and how green will it be?
Five predictions for energy in 2030
This is the impact that hydropower could have on a low carbon future
What will we eat in 2030
We need a food system that works for everyone, and our planet. This is how we can do it
Is this how we'll make things in 2030?
Tomorrow's production systems will be closer to nature
Why minerals could be the key to fuel clean energy transition
Podcast: how technology can help the environment

Existing Forum Initiatives

The Future of Environment and Natural Resources
The Future of Consumption
The Future of Energy
The Future of Production
The Future of Food Security and Agriculture

Shaping the future we want
Socioeconomic Systems

Opportunities for Transformative Change

Labour markets, training and social protection systems support inclusive societies while enabling the human workforce to realize its full potential along with intelligent machines.

- The difference between what humans (creativity, emotions, ambiguity, relationship) and machines (computation, repetition, memory) do best is clearly perceived and leveraged to unlock synergies rather than replacement.
- (Re)skilling people keeps them at the core of the labour market despite technological change. This is at the heart of the new social contract and corporations fully commit to it.
- New types of "universities" serve the "full human needs", including those of an ageing population.

Large-scale human mobility benefits people on the move, and at their place of origin and destination. Cities are able to leverage the benefits of migration rather than struggling to deal with its implications.

- Global mobility has allowed the development of talent pools that match national and corporate needs.
- Digital technologies provide portable access to social and physical networks, enabling identification, access to funds and personal data.
- Cities are key drivers in fostering the integration and social cohesion before, during and after (mass) migration.

Inclusive and effective healthcare solutions, including human enhancement, allow us to live not only longer, but also better.

- Health has now broken free from the "disease" silo and become an essential consideration in all areas of life.
- Food has become our medicine – and not vice versa.
- Advances in biotechnology and the efficiency that data-driven healthcare has provided have significantly lowered costs and therefore increased the access to drugs and treatment globally.

Further Analysis from the Global Future Councils

The digital economy: what is it and how will it transform our lives?
The global economy we want to create by 2030 - and how we can do it
Skill, re-skill and re-skill again. How to keep up with the future of work
After the crash, how can we rebuild trust in our financial institutions?
Healthcare in 2030: goodbye hospital, hello home-spital
What will healthcare look like in 2030?
Trade can help us create a better society for all - if we use it properly
By 2030, will traffic jams be a thing of the past?
Welcome to 2030. I own nothing, have no privacy, and life has never been better
Humanitarian crises are on the rise. By 2030, this is how we'll respond
As technology advances, how do we make sure it isn't being weaponized?
The society of the future looks nothing like you might imagine
Podcast: a glimpse into the future of the humanitarian system

Ideas for Collective Action

Holistic health system data and accountability
We need to collect data across all sectors relevant to health (healthcare, food, urban planning and housing, and the environment) to understand their impact holistically and act accordingly. Once the data collection system is in place, we need to create accountability mechanisms powered by new technologies, such as AI and blockchain, to support data integration and facilitate an intersectoral accountability mechanism that informs incentives for health creation.

Unlocking the elderly dividend
Currently, the elderly do not have an easy way to be productive in society, which affects their health and puts an extra burden on the healthcare system. We need to build new social institutions that enable older people to continue to be creative and occupy socially valuable roles after retirement. Academia and relevant governmental bodies should gather data on the impact of existing models that engage the elderly as assets to society; explore the cost-benefit of such interventions; and work with civil society and the private sector to investigate the most viable models and policies to scale this type of projects worldwide.

(Re)skilling to keep ahead of technological change
Develop solid and quantifiable metrics and certification of skills and make them internationally applicable: "skills as a currency". Move from degrees to skills, increasing project-based learning and hands-on creativity. Identify methods for people to develop "occupational intelligence" to understand how their jobs will evolve so they can take proactive steps for their professional growth. Increase the offer and recognize nanodegrees and micro-certification. Multistakeholder, industry-centric committees should identify the relevant skills needed and how they evolve, while educational institutions, governments and representatives of the private sector to develop the accreditation methodology, alongside technology experts (AI and blockchain in particular) who can design the implementation techniques.

Cross-cultural education
Enable the development and distribution of education materials and curricular assets that enhance social resilience and encourage cultural exchange. These materials, focused on primary and secondary education, would address issues of social exclusion within society, destigmatize migration etc. Explore how curricula can facilitate/recreate cultural immersion in local environments and redefine a broader definition of community and society.

Skills passport
Create a global "currency" for skill recognition that enables an individual to be recognized for the skills and credentials they have in a way that can be relied upon by an employer. This could be used by immigration authorities to match quotas and national needs. Develop an equivalency table that allows comparison. Start by creating a clearing house with frameworks for the certification of workers that enables government-level adoption, through multilayered agreements on coordination and reciprocation agreements.

Are you interested in contributing to any of these ideas? Click on their respective titles

Existing Forum Initiatives

The Future of Economic Progress
The Future of Education, Gender and Work
The Future of Financial and Monetary Systems
The Future of Health and Healthcare
The Future of Mobility
The Future of International Trade and Investment

Shaping the future we want
Technology and Governance

Opportunities for Transformative Change

Long-term and sustainable investments have supported large-scale system change in infrastructure and unlocked opportunities to leapfrog.

- We have developed efficient models for cross-border infrastructure investments.
- Infrastructure has become a key driver of better community-building, greater social cohesion and more inclusive societies.
- Idle capital is connected with ambitious and visionary parts of the population (especially youth) that want to create widespread positive impact.
- Most cities are now underpinned by smart infrastructure such as sewage and trash management systems, as well as autonomous and networked transport.
- The analysis of big data has helped us learn more about consumption patterns to make more efficient use of current infrastructure.

Sustainable flows of information and content inform, entertain and educate while empowering prosperous and inclusive economies and societies.

- The internet is preserved as an open platform.
- Hate speech, disinformation and other destructive content are significantly reduced.
- Sustainable and scalable solutions to the questions surrounding data protection and ownership are implemented.
- Citizens' increasing digital literacy and Fourth Industrial Revolution technologies are stimulating healthier digital citizenship and more responsible use of the online public square.

Further Analysis from the Global Future Councils

By 2030, what will regional governance look like?
This is what artificial intelligence will look like in 2030, according to one of the world's leading experts
Biotechnology: What it is and how it's about to change our lives
There is more to blockchain than moving money. It has the potential to transform our lives - here's how
By 2030, this is what computers will be able to do
Think cyberattacks only target big corporations? Wrong
Could you soon fly an airplane with your mind?
Where will space technology take us by 2030, and what does this mean for life on earth?

Ideas for Collective Action

Cybersecurity Peace Corps
The digital infrastructure of the world, on which the Fourth Industrial Revolution will be based, is under increasing cybersecurity threats. We should aim for the creation of an international body of people with relevant expertise that volunteer to come together (a new Peace Corps) to deal with and solve significant cybersecurity issues. Youth communities (Global Shapers, Young Scientists, Tech Pioneers, Young Global Leaders) should identify relevant experts from their communities to lead this effort, and partners across industries globally (starting with Silicon Valley) to finance and support the initiative.

Urban innovation
The rate of innovation in urban planning and operation is not up to speed for the needs of a rapidly changing society. This could be addressed through public competitions for civic ideas and urban ingenuity where creative people can contribute meaningfully. This should be coupled with a programme that leverages the skills of experienced citizens in infrastructure projects (volunteers and retired experts) who can work with the winners of the competitions to mentor and guide them. Public finance authorities could work with local businesses and private donor groups to finance the programme.

Online code of conduct
Convene a multistakeholder group comprising key media company representatives, NGOs, cultural leaders, cybersecurity experts and regulators to build a code of conduct on accuracy, validity and transparency of online sources and on protection and ownership of data. Appoint a sherpa from each organization represented in the Forum for a steering group/planning group. Next step would be to create a roadmap and then identify key stakeholders to engage.

Are you interested in contributing to any of these ideas? Click on their respective titles

Shaping the future we want
Technology and Governance

Opportunities for Transformative Change

New human-centred governance models and the development of strong system leadership allow people to maximize the benefits while minimizing the risks of the Fourth Industrial Revolution.

- Governance systems at both the local and global levels are increasingly inclusive, bottom-up and multistakeholder.
- Pragmatic new methodologies, experimentation and relevant design- and system-thinking principles are consistently applied in decision-making (in both public and private sectors).
- Blockchain-empowered platforms have created more distributed, less hierarchical organizational structures in which decisions are crowdsourced and value can be distributed equitably and in a transparent manner.

A shared and dynamic set of values are guiding responsible choices, not only in the development of technology, but also in its use as a force for good.

- Each community has a draft code of conduct for the development and application of technologies of the Fourth Industrial Revolution (artificial intelligence, robotics, biotechnology, etc.), which have a significant impact on people's personal lives and society at large.
- Decisions about the course of technological integration and development are influenced by the general public through physical and digital platforms that enable dialogue between them and the technology developers.
- We have managed to translate our shared values system into tangible outcomes and, as such, have empowered individuals and communities to create a life they have reason to value.

Ideas for Collective Action

Values in technology toolkit
Ethicists, technology researchers, policy-makers, historians and cultural leaders to perform a study on core values in different cultures and the need to adapt them to human-machine interaction systems, in the context of current technology trends. Include the impact of new values on people and society. Then define values for different industries and sectors and set concrete guidelines for implementation that can be used holistically for different actors in the field. (e.g. Digital Principles)

International standards body
Establish an international standards body that creates protocols with global scope to address both global and local challenges of emerging technologies (neutral, listening and inclusive body). This body will establish a global standard (similar to the ISO concept) for governing emerging technologies and their societal implications based upon multigenerational and multistakeholder decision making. It will also be in charge of the design of local level pilots - along with the relevant representatives on the ground- that will allow for quick learnings and iterations. Optimally this could lead to the creation of governance bodies similar to the FDA that can set standards for the safety, transparency and fairness of technology applications and be responsible for their approval.

Art for public engagement
Technology experts from academia and industry to work with artists, to co-develop art installations around the world as a medium for facilitating conversations between technically inclined scientists and a non-expert public. This will allow for the right questions to be raised and enable widespread citizen-science interface in a politically polarized world. Civil society and philanthropic organizations should work with the public sector (local and national) to provide the infrastructure needed for the expositions, as well as a global platform that allows for sharing ideas, best practices and lessons learned from similar initiatives around the world.

Are you interested in contributing to any of these ideas? Click on their respective titles

Further Analysis from the Global Future Councils

What is behavioural science, and how is it going to change your life?
Five reasons the future of brain enhancement is digital, pervasive and (hopefully) bright
What are platforms and systems, and why are they so important?
To tackle global challenges, the public and private sectors must join forces. Here's why
The Fourth Industrial Revolution is here. What laws do we need to make sure we all benefit from it?
As technology advances, how do we avoid losing touch with our values?
Podcast: A glimpse into the future of technology and governments

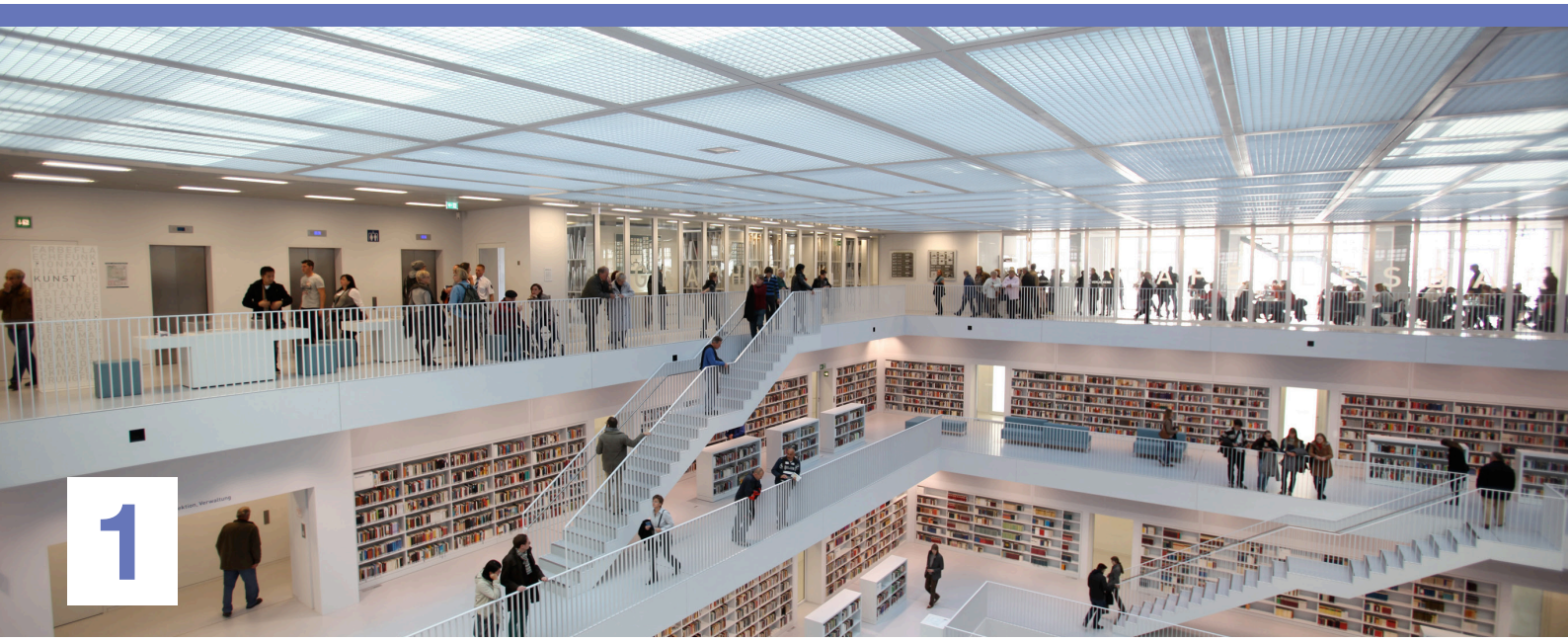
Existing Forum Initiatives

The Future of Digital Economy and Society
The Future of Information and Entertainment
The Future of Long-Term Investing, Infrastructure and Development
Center for the Fourth Industrial Revolution

The world in 2030
Five levers of change

The discussions across the different councils surfaced five common levers of change that could trigger change across a wide range of issue areas and accelerate the realization of the common aspirations of the Network.

Five levers of change
Turning the future we want into reality



1

Developing life-long education and training systems

Globalization, innovation and new technologies require life-long training systems helping individuals of all ages to learn skills needed for a changing world.

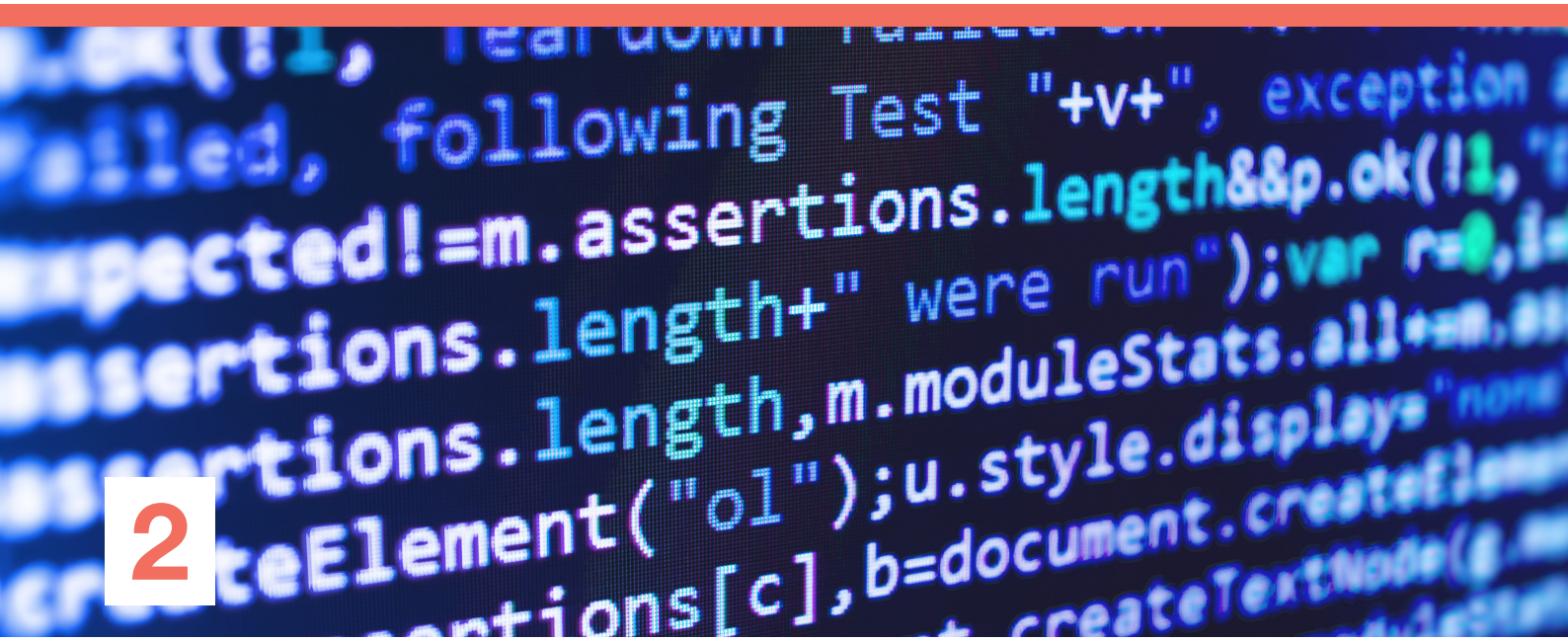
The world of work is changing radically. However, mainstream education systems are not keeping up with the pace and depth of change and are largely inadequate for these new labour markets. New ways to develop talent and deploy it need to be developed to ensure the world's population can fulfil its potential and drive society forward.

If we aspire to keep humans at the centre of the Fourth Industrial Revolution, we need to invest in their education. The uncertainty inherent to this context not only makes the acquisition of new skills necessary, but also requires versatility and the ability to continuously adapt to a fast-changing environment. As a result, we need new delivery methods that allow for continuous upskilling and reskilling.

The new education and training systems have to be more than merely a revised version of the current ones. Approaches to training need to be interdisciplinary, cross-functional, cross-industry and cross-cultural. We need to rethink education systems and transition from a focus on children and youth to life-long learning opportunities for all. In addition, we should move in the direction of certification of credentials in small increments rather than only at the level of degrees.

Fourth Industrial Revolution and education experts should work together to prototype new programmes and curricula for life-long learning. Furthermore, experts and decision-makers should develop a language to coherently describe skills and mindsets that can be developed and are required in the marketplace.

SkillsFuture, an initiative by the Ministry of Manpower of Singapore, is a good example of what can be done. The initiative seeks to develop skills within the population by providing tailor-made training courses with the objective of creating a highly skilled and competitive workforce that contributes to a higher standard of living. Key focus areas include helping individuals make well-informed choices in education, training and careers; developing an integrated, high-quality system of education and training that responds to constantly evolving industry needs; promoting employer recognition and career development based on skills and mastery; and fostering a culture that supports life-long learning.



2

Hard-coding diversity and gender parity into technology

Diversity is a crucial element for organizations to survive and thrive in a fast-changing world.

The need for diversity is not only a question of fairness but, most importantly, a crucial element to make organizations and societies more intelligent, resilient and successful. However, as the Fourth Industrial Revolution unfolds, two fundamental diversity issues arise:

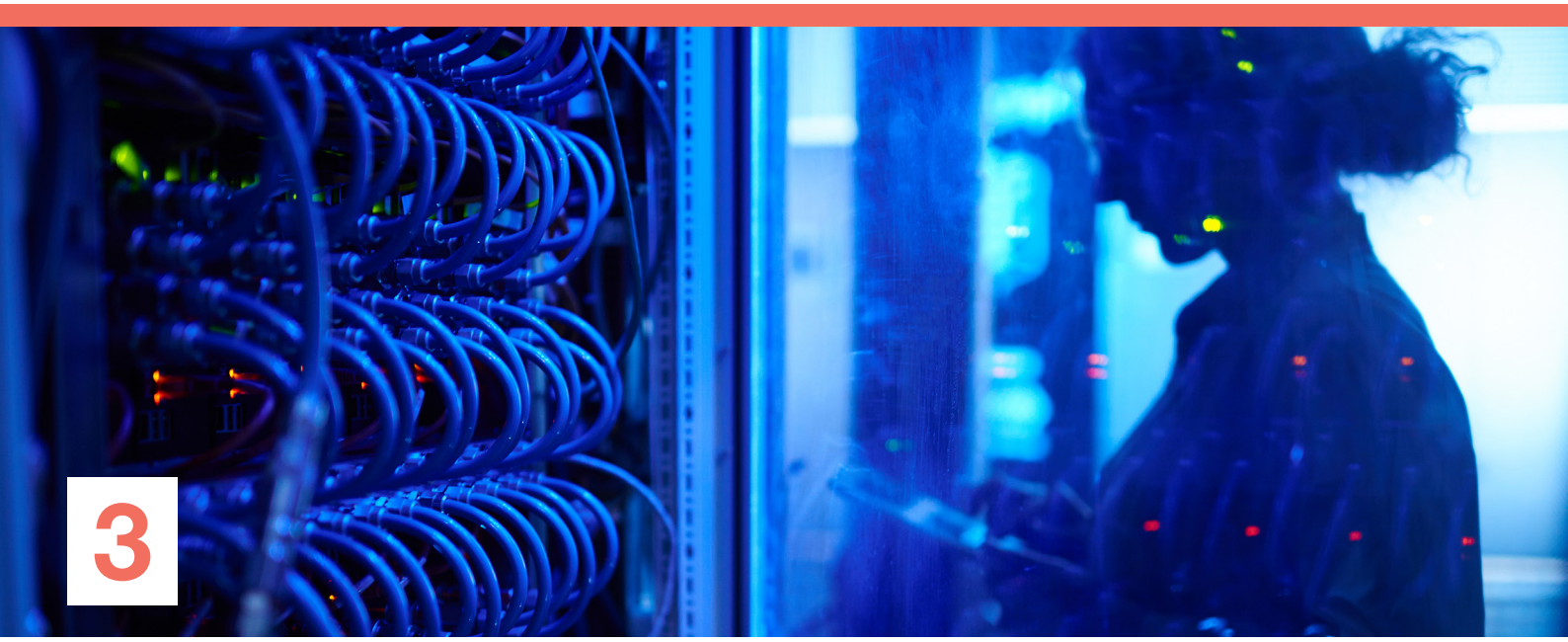
As algorithms increasingly rule our lives, coders, and software and AI engineers can now be seen as the new "lawmakers" who write the code that is shaping our future. Because this group is homogeneous, however, they cannot truly represent or – even less – create a future that reflects the diversity of values, expectations and needs of society as a whole.

But making these "lawmakers" aware of their intrinsic bias will not be enough. This group needs to diversify for its own sake to avoid unimaginative groupthink and to shape a future that works for all.

Diversity needs to be hard-coded at the core of the system. This includes diversity of thought, socio-economic backgrounds, geography, ethnicity, gender, age and sexuality. All groups – particularly women and minorities – should not only have access to basic computing and programming skills, but also be included in building those new systems. A promising example of this effort is IamtheCODE , a global movement that mobilizes government, the private sector and investors to equip people to understand and participate in the digital world by writing their own code. By 2030, this global movement plans to train 1 million women and girls.

In addition, we have seen how tailored online environments create echo chambers that expose us to like-minded people and content that reinforce our views. This strengthens our biases and undermines the ability to understand the bigger picture. It leads to the development of a fragmented and polarized society, reducing people's exposure to diversity rather than enhancing the ability to embrace it.

We should be aware of the implications of a customized online environment and develop tools to tear down those echo-chamber walls. AllSides represents an interesting initiative to move into this direction by delivering technology and services to provide multiple perspectives on news and the people behind the ideas.



3

Harnessing data as a force for good

Data is at the core of our economy and society; we need to ensure it is understood and used as a force for good with informed choices and consent.

If we were to look at our entire society as a human body, data would be its blood. Data has the potential to propel societies forward, enable innovative business models and help governments address legitimate policy concerns. At the same time, data is neither neutral, nor can it be made so. Instead, data represents a compilation of human history, with all its inherent faults and biases. If we do not consider this when developing algorithms or when training people using the data we have compiled, it will most likely repeat and reinforce historical biases.

In addition, data is less bound by physical boundaries and easily escapes the jurisdiction of individual nation states and institutions. Data in the wrong hands – of malfeasant individuals, corporations or governments – can destroy freedoms and liberties faster than at any time in history.

Data exploitation of the kind we see in online advertisement retargeting or in social media forces us to question companies' use of our data for profit without concern for externalities. The trustworthiness, inclusiveness, stability and sustainability of the digital economy and society – and therefore the ability to create a positive and sustainable future that works for all – depends on our capacity to develop strategies and governance models for data. The slowness and rigidity of traditional regulatory mechanisms does not allow them to supervise, monitor and enforce such strategies and principles on their own.

Data Collaboratives represents an innovative example of how data can be harnessed to improve people's lives beyond commercial purposes. Data Collaboratives engages participants from different sectors including private companies, research institutions and government agencies to work together to solve problems, from addressing climate change to public health and job creation. More generally, stronger industry agendas are needed while making sure that we create fair and transparent data pricing and define mechanisms for data storage that limit the over-concentration of power.

To drive these developments in the right direction, stakeholders need to define a common vision and goals; create regulatory agencies that are able to enforce the necessary standards; and develop frameworks and principles for global, national and local systems of data governance to enforce the ethical limits of exploiting personal data and ensure it is kept safe.

4

Designing new social contracts

The Fourth Industrial Revolution can create a Renaissance for humanity in which we coherently reconfigure values for humans, economic arrangements, and sustainability of the planet and its ecosystems.

Ubiquitous technological development is reshaping individuals, organizations and societies and altering existing structures. However, most aspects of our lives and society are still based on organizing principles such as our nation states, democracies, work or social protection systems date back decades or centuries.

Growing structural unemployment, inequality in income, power, wealth and opportunities as well as the polarization of public opinion and the perception that institutions are not suited to respond to challenges anymore only prove the urgency of a fundamental rethinking. Widespread discontent, cynicism and lack of trust are reinforcing the need to develop new social contracts, laws and agreements, and to redefine the relationship between individuals, companies, governments and civil society as well as each of these stakeholders' rights and responsibilities.

In other words, we need a 21st-century consensus that embodies what we value as a society and that will lay the foundations needed to materialize the future to which we aspire. This "Renaissance" will enable people to derive meaning beyond work, engage at deeper levels with each other, their communities and the world. GDP and productivity growth need to be replaced by a new measure of progress that is more human-centred and purposeful.

Such a fundamental paradigm shift will not be easy to develop and implement, and will be faced with resistance and upheaval. Any deep redesign of the system involves a redistribution of power and resources, which will affect some groups and interests. One of the more contentious but simplest examples of this is the debate about the implementation of a universal basic income. Theorists and ethicists should be involved to draft ideas that should then be refined by stakeholders representing all sectors of society. A model that could be replicated for this is the XPrize-type contest. This would help push the limits of what's possible, capture people's imagination and inspire others to move in a similar direction, generating more innovation and scaling impact.

Focusing on long-term visioning and short-term experimentation

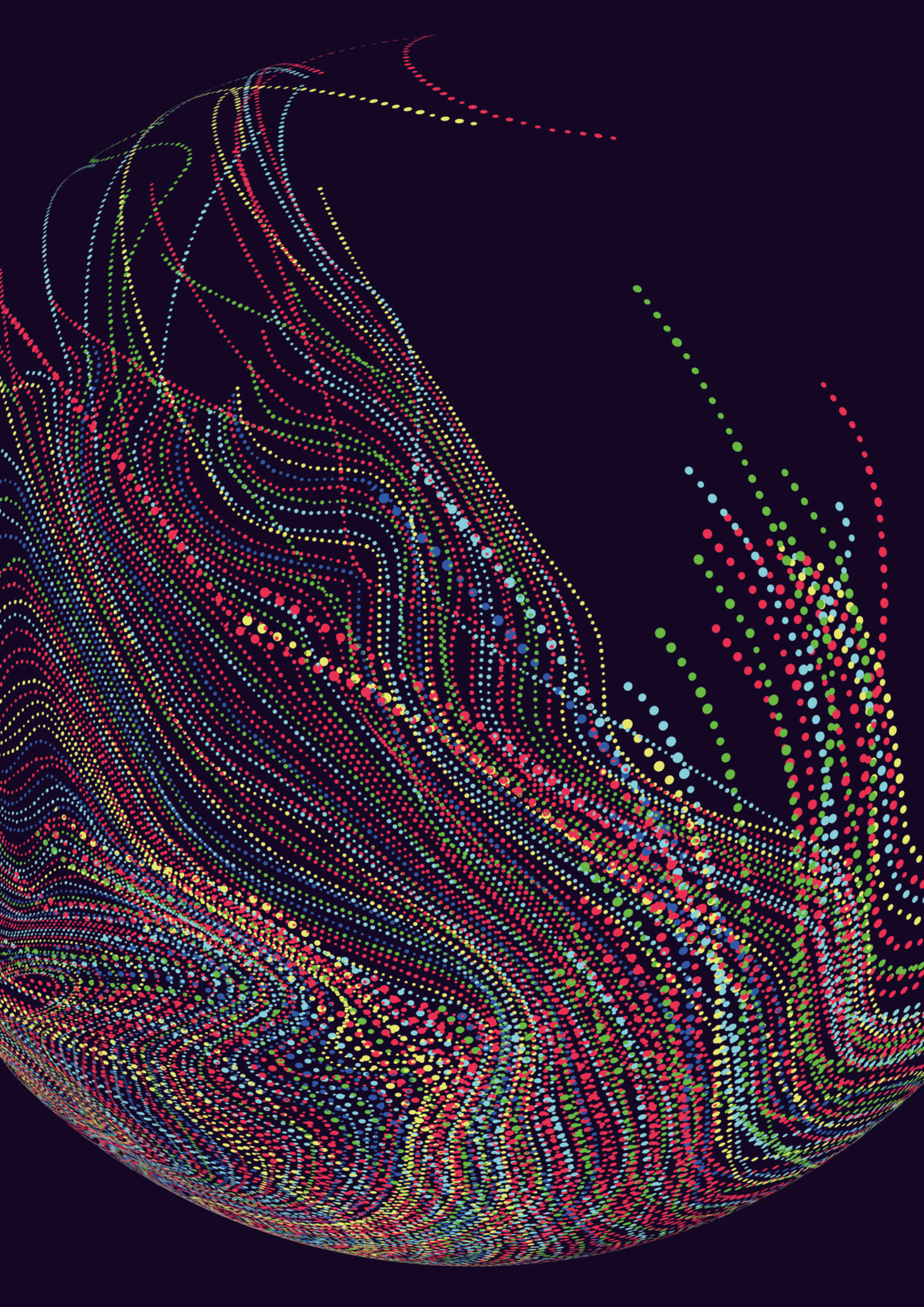
Long-term thinking with the willingness to fail quickly, learn and iterate is key to successfully leading in a volatile, uncertain, complex and ambiguous environment

The ability to seize opportunities and tackle challenges as they arise, and the ability to foresee and shape long-term futures are two fundamental characteristics needed to lead in a fast-changing world. However, leaders often get locked into muddling through – unable to take timely actions or enable long-term thinking. The willingness to fail quickly, learn and iterate is missing in too many settings while elections, board tenures and the stock market block most leaders in mid-term planning and budgeting. In addition, people tend to overestimate how quickly things change in the short term, and underestimate how much things change in the long term.

The incapacity to do so not only hinders the ability to solve some of the foremost challenges, but it also triggers some of those issues in the first place. This leadership challenge is a consequence of a mindset issue and wrong incentive systems.

To overcome this challenge, leaders could take more adaptive and effective approaches. On one hand, this requires carving out time and space for creativity and long-term thinking – the decision of Unilever to move away from quarterly profit updates to a longer view is one of the best examples of this approach.

On the other hand, it requires prototyping and piloting solutions here and now, testing them in the real world, learning from experimentation and iterating towards long-term objectives and aspirations. Social Labs shows how this can work. These labs convene stakeholders from across the system to identify the root causes behind a given issue and work together towards its resolution. As no single way or intervention is usually enough to tackle a complex issue, Social Labs develop portfolios of prototypes that are tested in the field, tweaked and improved or discarded. This iterative approach has proven to be efficient and effective.



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