



THE INFINITE ECONOMY

Version 1.0

The Infinite Economy, like its predecessor, *The Third Era*, is meant to be an ever-evolving exploration of the futures of economic life. As VFS continues its work with clients and communities around the world, we will continue to reflect our evolving understanding of what the economic landscape of the future looks like.

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Brandon Silva

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Reframing the Future

"We see a world of abundance, not limits. In the midst of a great deal of talk about reducing the human ecological footprint, we offer a different vision. What if humans designed products and systems that celebrate an abundance of human creativity, culture, and productivity? That are so intelligent and safe, our species leaves an ecological footprint to delight in, not lament?"

William McDonough and Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things*.

The Infinite Economy: Driving a Transformation

The Future is a Choice

A review of current global trends such as population growth, continuing industrialization, rising energy demand, massive urbanization, and long term climate change shows that humanity is entering uncharted territory with respect to the material and organizational challenges it will face in the coming decades.

Yet, despite these considerable challenges, a review of humanity's history and an exploration of the presently dim outlines of the future both strongly suggest that humanity can and is developing the insights and tools to dramatically raise the material security and affluence for all *if it chooses to do so*.

Thus, the future is very much a matter of vision and of choice.

But good choices - effective choices - require insightful framing and good information. In order to make effective choices for the future of economic life, we have to understand the patterns of history and examine the dynamics of the present.

Looking back, we see that economic history is a long narrative of challenge, cultural innovation, and exchange. Looking forward, we see signs of a new technological wave building. Together these portend a future of significant disruption and incredible potential.

Yet, the point here is not to predict what daily economic life looks like in 30 years, but rather to help readers to see that we have an opportunity, right now, to shape the economies of the future.

At its core, therefore, the *Infinite Economy* is about the *choice* for transformation.

Facing the Future

Revolutions in the way we live our lives can, and do, happen. But such revolutions always bring meaningful disruption; the path ahead will be challenging and filled with uncertainty. Nothing about our economic futures is guaranteed except that our choices, as policy makers, as innovators, and as consumers, matter.

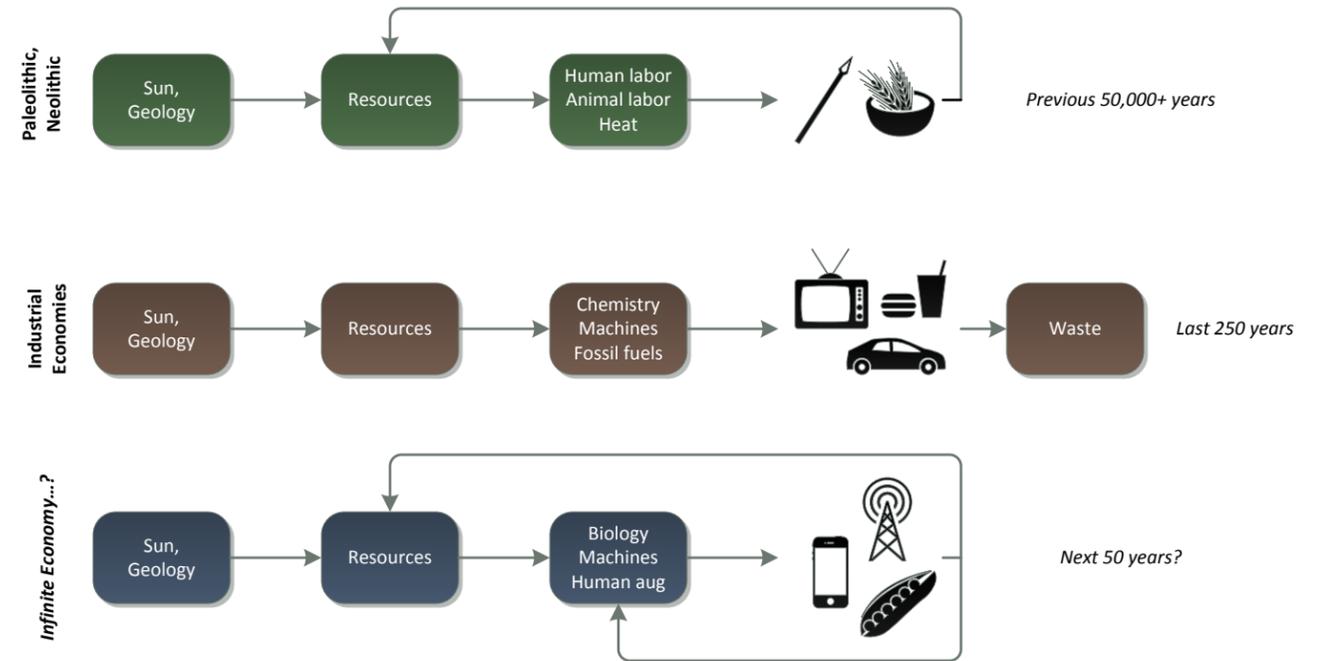
The economic challenges rising before us are in many respects unprecedented in their scale and scope. In order for our world to successfully meet these challenges we are going to have to choose to create the economies that we need. In order to do that we need to see a broader landscape of possibilities and we need more minds and more hands collaborating on solutions.

The *Infinite Economy* is an attempt to provide a framework and the information leaders, innovators, and consumers need to make sense of the changes occurring around us and to take informed action towards the economic futures we desire.

In the end creating an *Infinite Economy* will be about cultural innovation and cultural evolution. It will be about changing what we make for ourselves, how we make it, and why we make it.

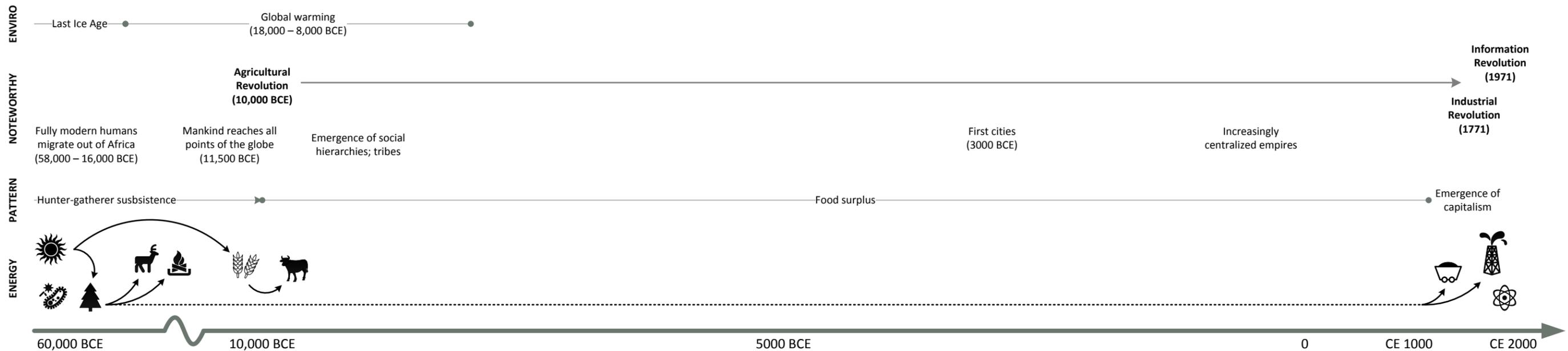
And in order to both meet our collective economic challenges and to create more desirable futures for all, we will need greater cultural evolution in the decades ahead, not less.

CHANGING "MODELS" OF ECONOMIC LIFE



"The Infinite Economy is the potential for a new material reality that emerges from the co-evolution of a broad landscape of technological, social, and philosophic changes."

HUMANITY'S LONG ECONOMIC HISTORY



Emerging Economic Challenges

Humanity has always been challenged when it comes to providing basic material security. While the Earth is abundant with many resources, having access to the right resources, with the right productive techniques, for a given population in any one location has always been an adaptive challenge.

Today we are facing a global future in which there will be more people, living more closely together, in more energy-demanding lifestyles than previous generations would have thought possible. Current projections see humanity in the coming decades as an intensely urban and deeply interconnected species, perhaps heralding a new turning point in human history.

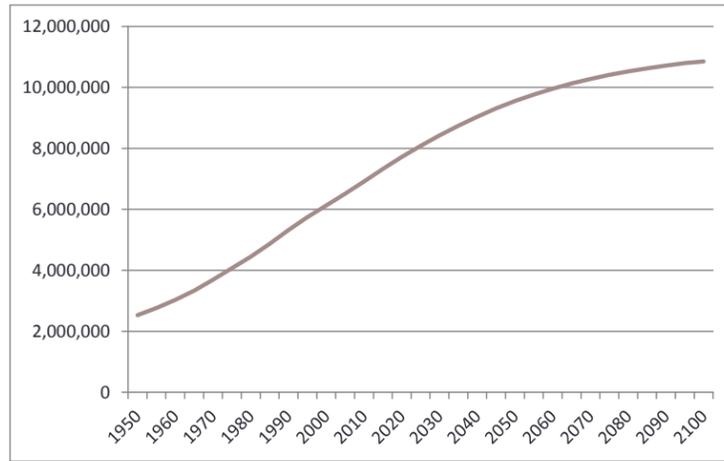
Growing societies with rising material demands combined with the impacts of long-term climate change on local and regional weather and ecosystems presents an even more complex context. Add to that the fact that our current economic systems, from supply chains to capital markets, are global and interdependent and the picture we start to see is simply unprecedented in its scope, scale, and inherent complexity.

On a different scale, economic sectors, industries, and individual companies will be trying to adapt to the realities of long-term demographic shifts, long-term structural changes in labor markets, and the increasing dominance of digital connectivity, data, and automation as the defining characteristics of daily economic life.

Our steadily increasing ability to do more with less will be fed in part by continuous innovation and relentless global competition. Yet these advances will be powerfully countered by the world's dramatically rising demand for resources. And this historically marvelous "perpetual advancement engine" at the heart of capitalism will itself be increasingly questioned – and often rejected – by digitally connected and empowered populations facing diminishing economic prospects and concerned with what are often linear and short-term paradigms of economic life.

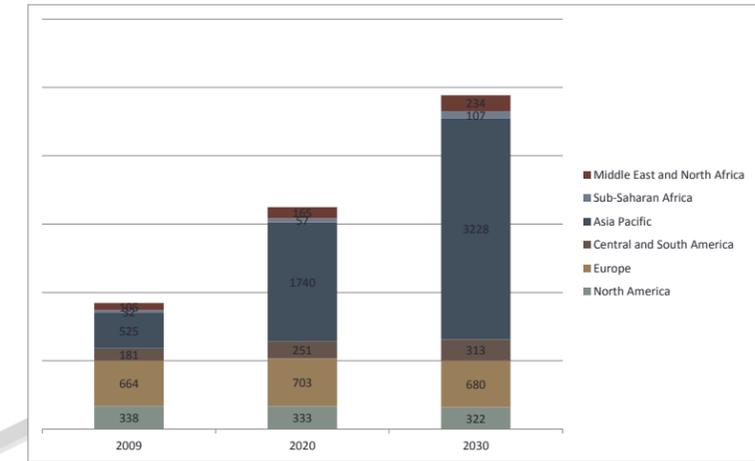
"People confront, and solve, such problems every day, which is why social development has generally kept moving upward since the end of the last ice age. But as we will see, at certain points the paradox of development creates tough ceilings that will yield only to truly transformative changes. Social development sticks at these ceilings, setting off a desperate race."¹

World Population



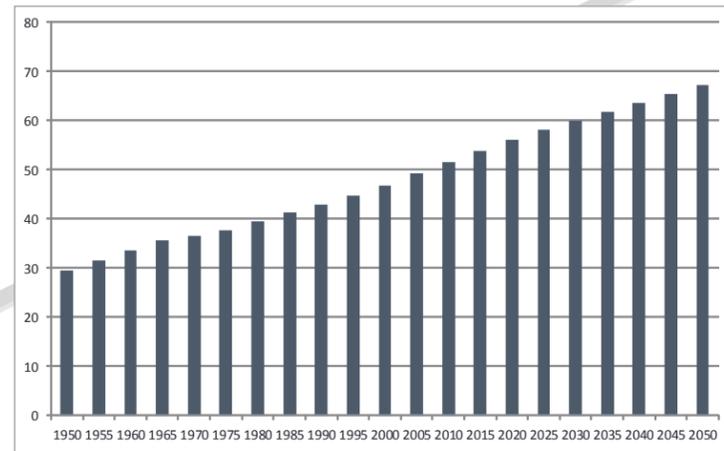
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2012 Revision

The Emerging Global Middle Class



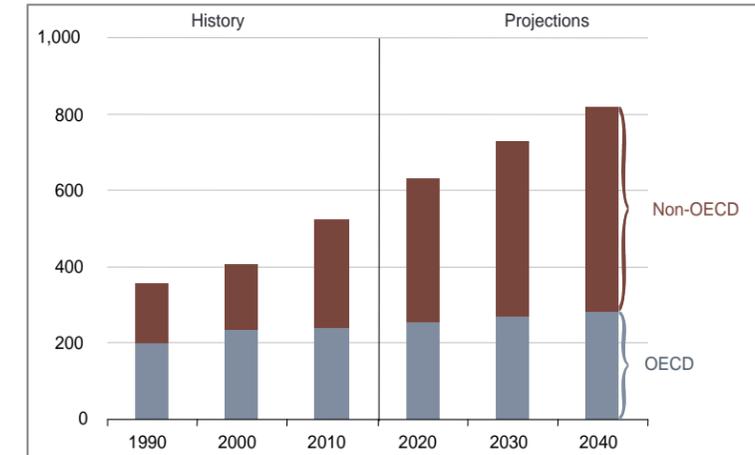
Source: The Emerging Middle Class in Developing Countries. OECD Development Centre Working Paper No. 285. Homi Kharas

Percentage of World Population in Urban Areas



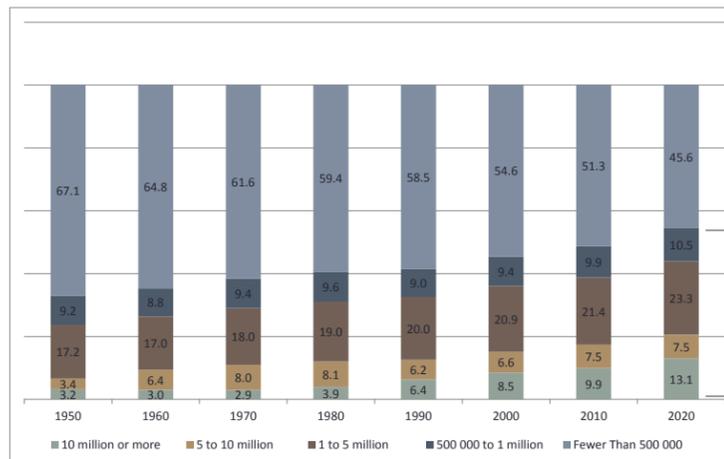
Source: United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects

World Energy Consumption (quadrillion Btu)



Source: U.S. Energy Information Administration, International Energy Outlook 2012

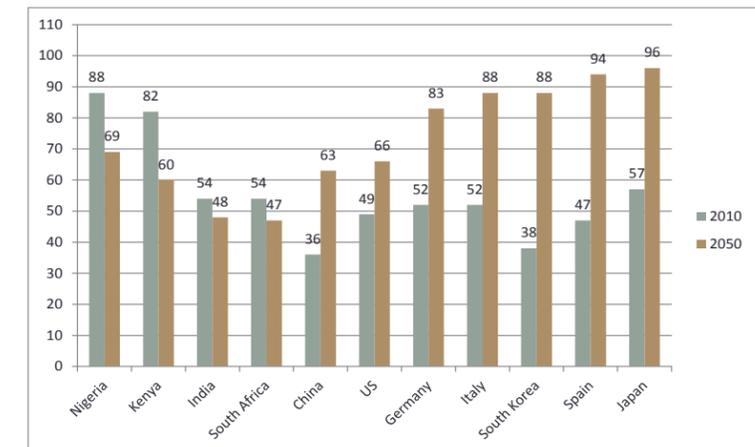
Percent of World Population by Class of Urban Settlement



Source: United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects

54.4% of the world's population living in cities of 500,000 or more

Number of Dependents Per 100 Individuals of Working Age



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2012 Revision

¹ Ian Morris. *Why the West Rules—for Now: The Patterns of History, and What They Reveal About the Future.*

The Patterns of History: how we got to the present

Much is said about the importance of looking to history in order to anticipate the future. History certainly never repeats itself in all its wondrous specificity, but patterns do form and sometimes recur across time. And while professional futurists hesitate to assume the future recurrence of any historical pattern, such patterns are typically the starting point for serious explorations into the future.

When we look back at history, we can discern certain dynamics that seem to have propelled us forward over time. Stretching back to the earliest days of humanity, we find that specializing our individual labor and trading with others has allowed humanity to culturally innovate, adapt, and prosper around the world.

More recently, the last two centuries have seen the rise of capitalism and dramatic increases in population, productivity, and material affluence. Here we are witnessing a more intense dynamic of change, one in which technology and the use of new energy sources has amplified the historic patterns of trade and specialization.

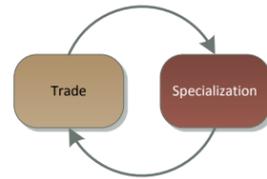
Taken together, our long economic history on this planet is a story of challenge and adaptation, of culture and technological change.

And while history is never a perfect guide to the future, it often provides deep insights into what is potentially to come.

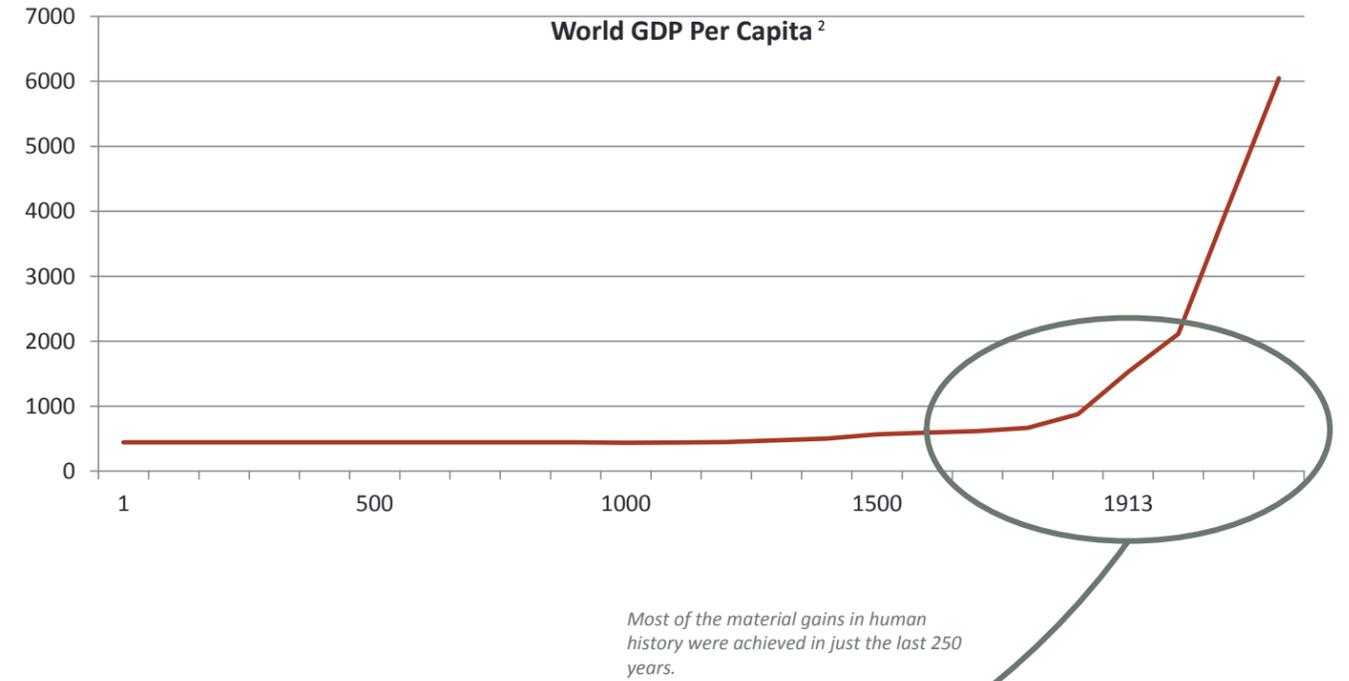
THE LONG HISTORY OF HUMAN PROSPERITY

The author Matt Ridley has argued that the twin phenomena of specialization of labor and trade between individuals and groups have jointly propelled humanity forward in its material prosperity across its long history on Earth.

Our ability to focus on developing our unique skills and resources, coupled with economic connectivity to others, is part of the secret to our seemingly infinite capacity for innovation and adaptability.



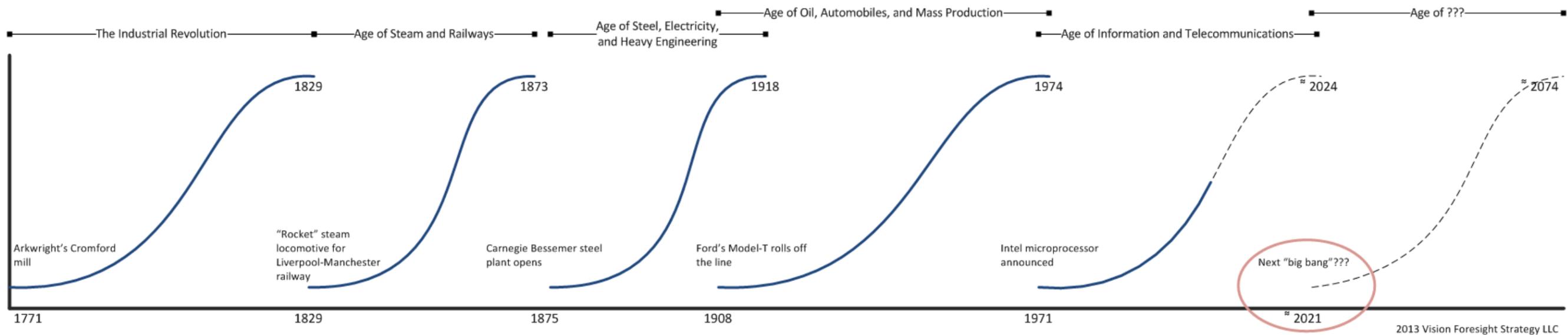
*"Exchange is to cultural evolution as sex is to biological evolution."*¹



"CREATIVE DESTRUCTION," TECHNOLOGICAL REVOLUTIONS, AND ECONOMIC CHANGE

The famous economist Joseph Schumpeter coined the term "creative destruction" to address the process, inherent to capitalism, that perpetually supplanted the old with the new.³ Schumpeter saw these revolutions coming in "discrete rushes," and the modern economist Carlota Perez sees these "surges" as part of an ongoing cycle of technological revolution.⁴

Over roughly the last 250 years, five of these surges have brought waves of technology-driven change to economic life since the first irruption of the industrial revolution in the late 18th century. And it has been an historic period, seeing a radical growth in both human population as well as human productivity.



Adapted from Carlota Perez, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*

¹ Matt Ridley. *The Rational Optimist: How Prosperity Evolves*

² Angus Maddison. *The World Economy*

³ Joseph A. Schumpeter. *Can Capitalism Survive?: Creative Destruction and the Future of the Global Economy.*

⁴ Carlota Perez. *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages.*

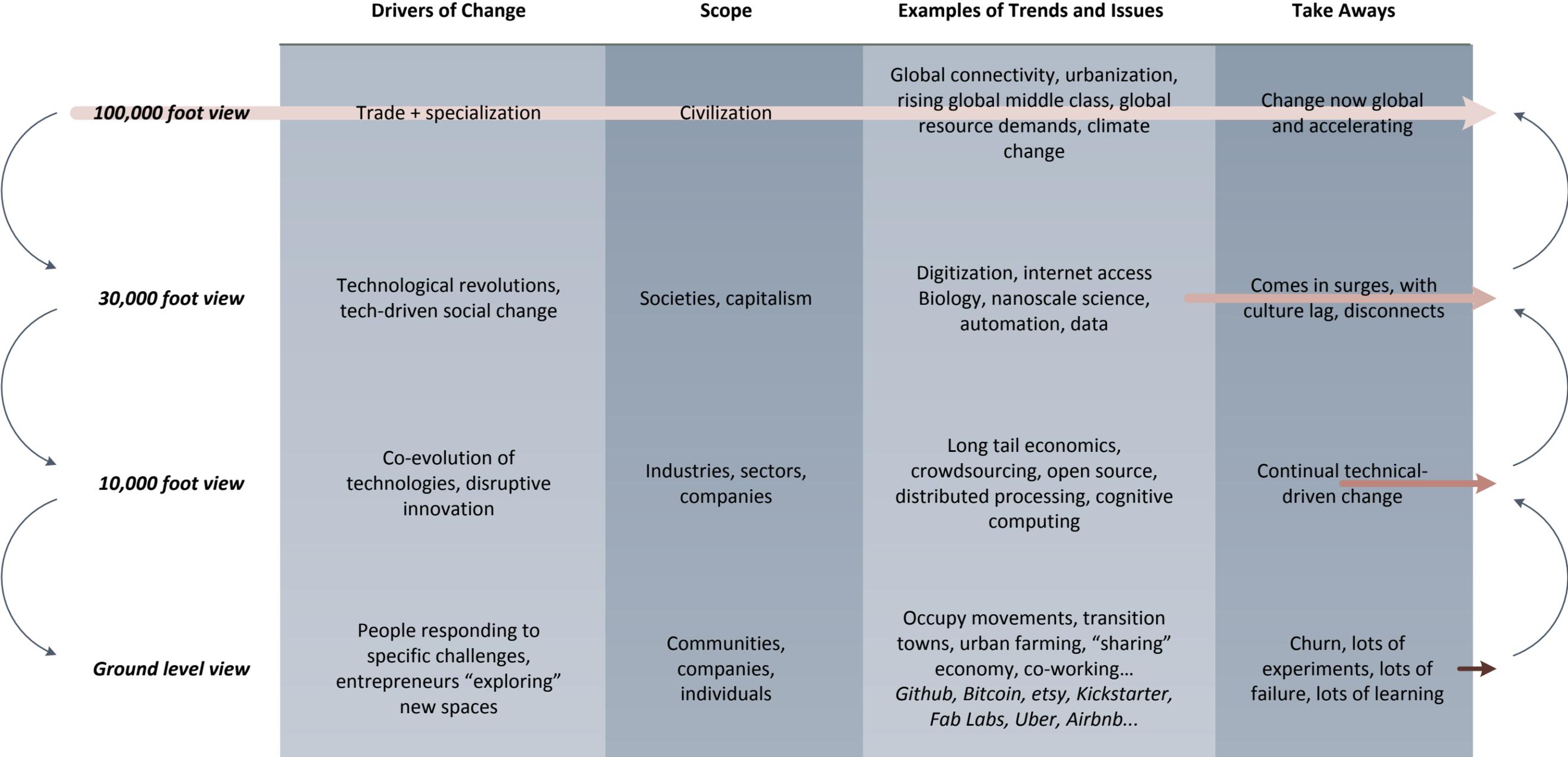
Surveying the Landscape

To get a good understanding of the complexity of the economic changes underway today we have to employ a bit of optics. By looking at things from different “heights” we get a better sense of the multiple and different dynamics that are occurring. No one view can tell the entire story and only by including all of these views in our analysis can we develop a comprehensive picture.

Our exploration of the emerging economic landscape begins here.

From the 100,000 foot view we can see the grand movement of humanity and the core processes that continue to drive it forward. At 30,000 feet we can make out the long-term cycles that drive change in capitalism and across individual societies. From 10,000 feet we can see patterns and trends across industries. At the ground view we find ourselves amidst the chaos of endless fads, hype, determined experimentation, and intense competition.

While the longer term shifts provide the context and impetus for lower level changes, the dynamics at lower levels feed into and affect the larger patterns.



Snapshot of the Present: the 30,000 foot view

From the 30,000 foot view what we see is the perpetual process of “creative destruction” identified by Schumpeter and detailed by Perez. This is the level of technological revolutions and, roughly speaking, 50 year cycles of change and adaptation. Here we can anticipate dramatic changes in economic life yet are unable to predict what the new patterns will look like.

If, as we suspect, global innovation is accelerating as the world’s population is knitted together in pervasive electronic networks, then we anticipate that the historical cycles of technological revolution and subsequent social and economic transformation will increase in frequency.

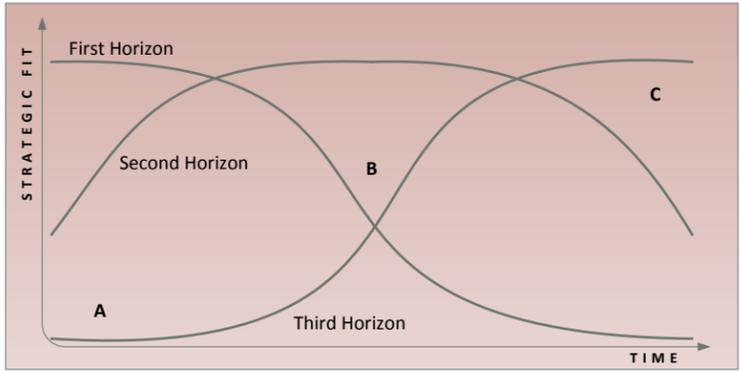
It is here, zooming in to the present and the near future, where these “waves” of change are overlapping to a greater degree than ever before. Here then is where we find it useful to switch to a “three horizons” framework, one that illustrates aspects of three different “surges” existing at the same time.

Viewed through the three horizons lens we see that many of our institutions and core assumptions, deeply imprinted by the mass production age of the fourth great surge, are still trying to fully adapt to the techno-economic paradigm of the Information Age, what Perez identifies as the fifth surge. Yet we are on the verge of witnessing, if we have not already witnessed, the “big bang” of the next great surge. While the ultimate nature of this next technological revolution is as yet unclear, there are a number of logical possibilities to explore.

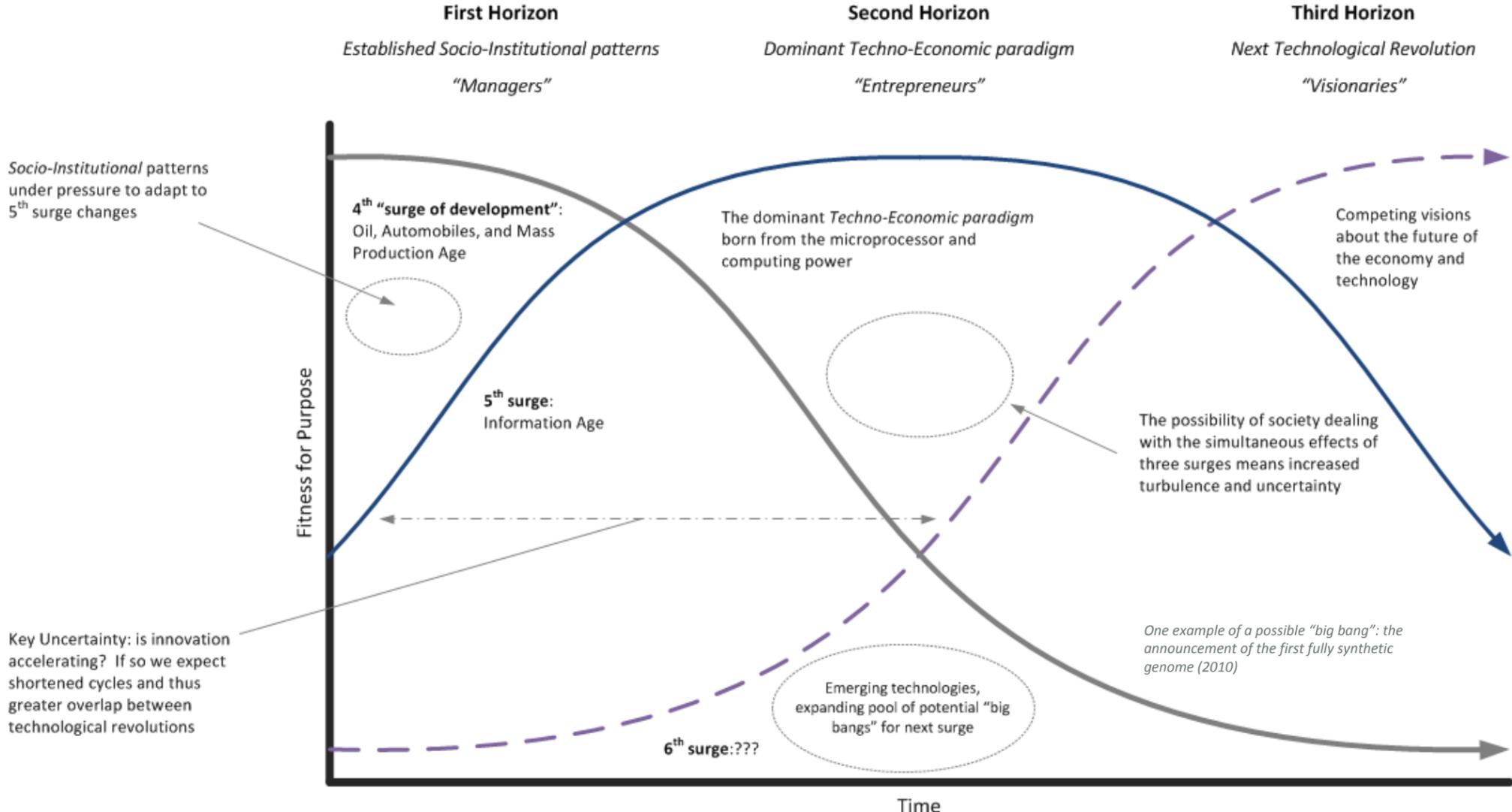
The perspective from this height reinforces the observation that technology, arriving in discernible waves, requires that society “catch up” and adapt, creating what the sociologist William Ogburn called “culture lag.” While this has always created dislocation and uncertainty, if human innovation is indeed accelerating, and if the technological cycles overlap more than in the past, then we would expect greater turbulence and dislocation than ever before.

The three horizons is a futures framework developed by Tony Hodgson and Bill Sharpe¹ to visualize the overlapping changes underway in society. The first horizon represents the key assumptions and structures of the present that are becoming less fit for purpose. The third horizon represents early-stage emerging issues coming into notice. The second horizon represents the trends that have been most directly putting pressure on the first horizon.

- A: “‘Pockets of the future’ embedded in the present”
- B: “Futures space in which policy and strategy conflicts play out”
- C: “Visions of the future”



Curry and Hodgson²



THREE HORIZONS OF ECONOMIC CHANGE

The deep social imprints of the first horizon make institutions resistant to the changes demanded of the rising second horizon, and leave them downright bewildered by the “radical” suggestions from the third horizon. Second horizon stakeholders, optimistic and confident that they are “living the future” are impatient with old institutions and intent on creating new value. Meanwhile, those exploring the dim outlines of the third horizon are compelled to describe futures that are either magical or horrifying to others, and to advocate for changes which, as yet, seem to benefit no one.

¹ Bill Sharpe and Tony Hodgson. *Intelligent Infrastructure Futures Technology Forward Look: Towards a Cyber-Urban Ecology*. Foresight Programme, Office of Science and Technology, UK Government.
² Andrew Curry and Anthony Hodgson. “Seeing in Multiple Horizons: Connecting Futures to Strategy.” *Journal of Futures Studies*. August 2008.

Framework of the *Infinite Economy*

The *Infinite Economy* is fundamentally about framing our economic futures so as to enable people to understand and take advantage of the changes that are underway. It is, therefore, fundamentally about creating an economic future that we desire.

The framework provides a way of grappling with the complexity of what is underway and a way of seeing our economic lives as a cultural adaptation that we construct.

ELEMENTS OF THE INFINITE ECONOMY

The building blocks of our economic futures.

Railways of Tomorrow

The emerging economic infrastructure is rooted in the digital and fundamentally about connectivity.

Infinite Capital

The “factors” of our future productive capacity represent both new and vastly expanded traditional pools of resources.

Platforms of Production

The three families of new technologies that radically alter the scale and processes for how and why we make things.

Infinite Mindset

The new worldviews and values that are driving change and shaping the innovations we are pursuing.

Emergent Models

The heart of it all and where all the other elements come together in experimentation, exploration, and innovation.

KEY PRINCIPLES

The guiding, and driving, principles of our economic futures.

Adaptation Through Culture

Culture is how we adapt to challenges and how we adapt the world to our needs. Economic life is culture...

Technology is Central to Adaptation

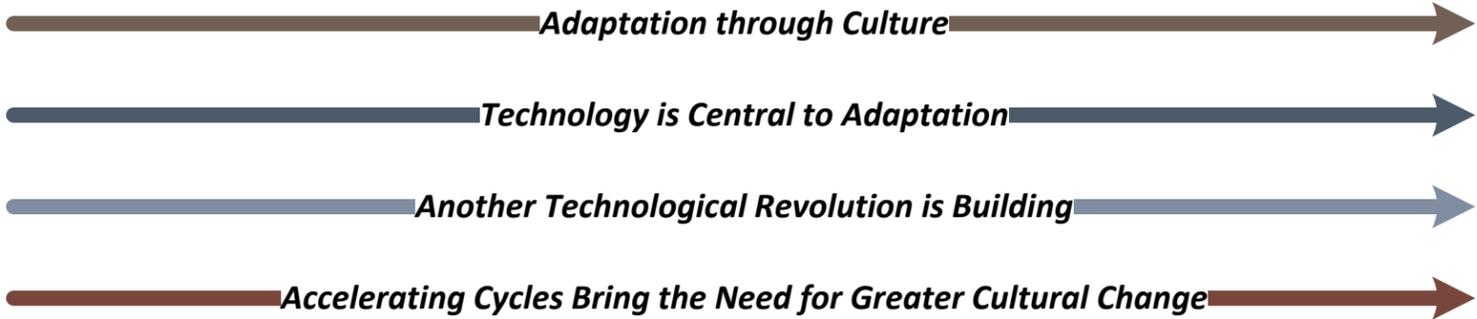
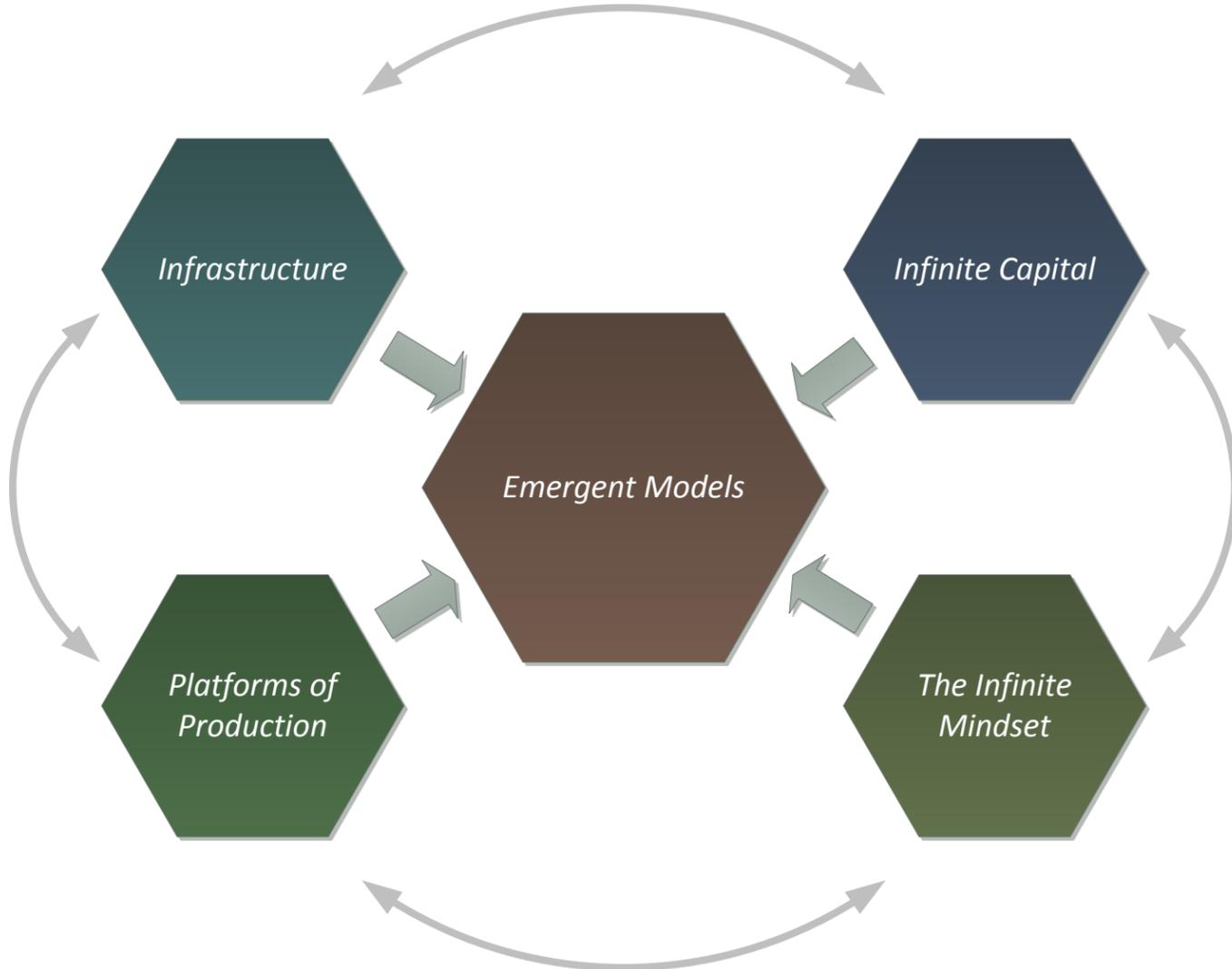
The tools we create and the ways we use them are a critical component of our adaptive capacity.

Another Technological Revolution is Building

Another revolution is coming and this time there are more new technologies and potential innovators than ever before.

Anticipate Accelerating Change

Accelerating waves of change will bring turbulence and dislocation, which provides the central opportunity: society will need both new definitions and models as well as greater sustained adaptability, which means more collaboration, more experimentation, and more innovation.



An Age of Microbes and Machines: the logical revolution

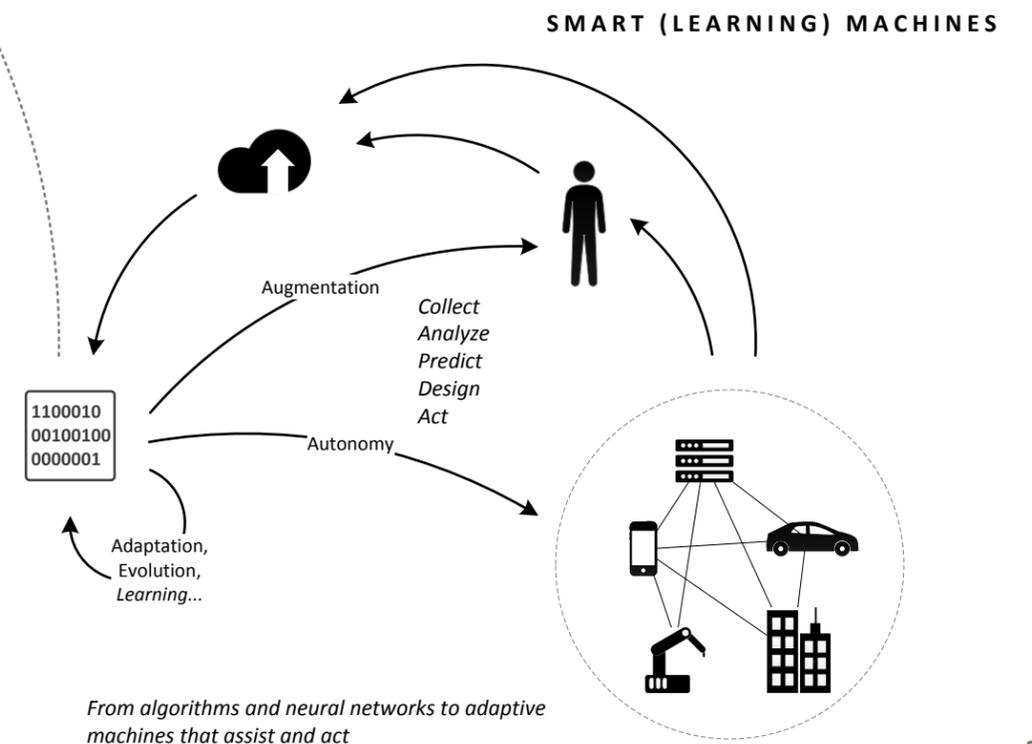
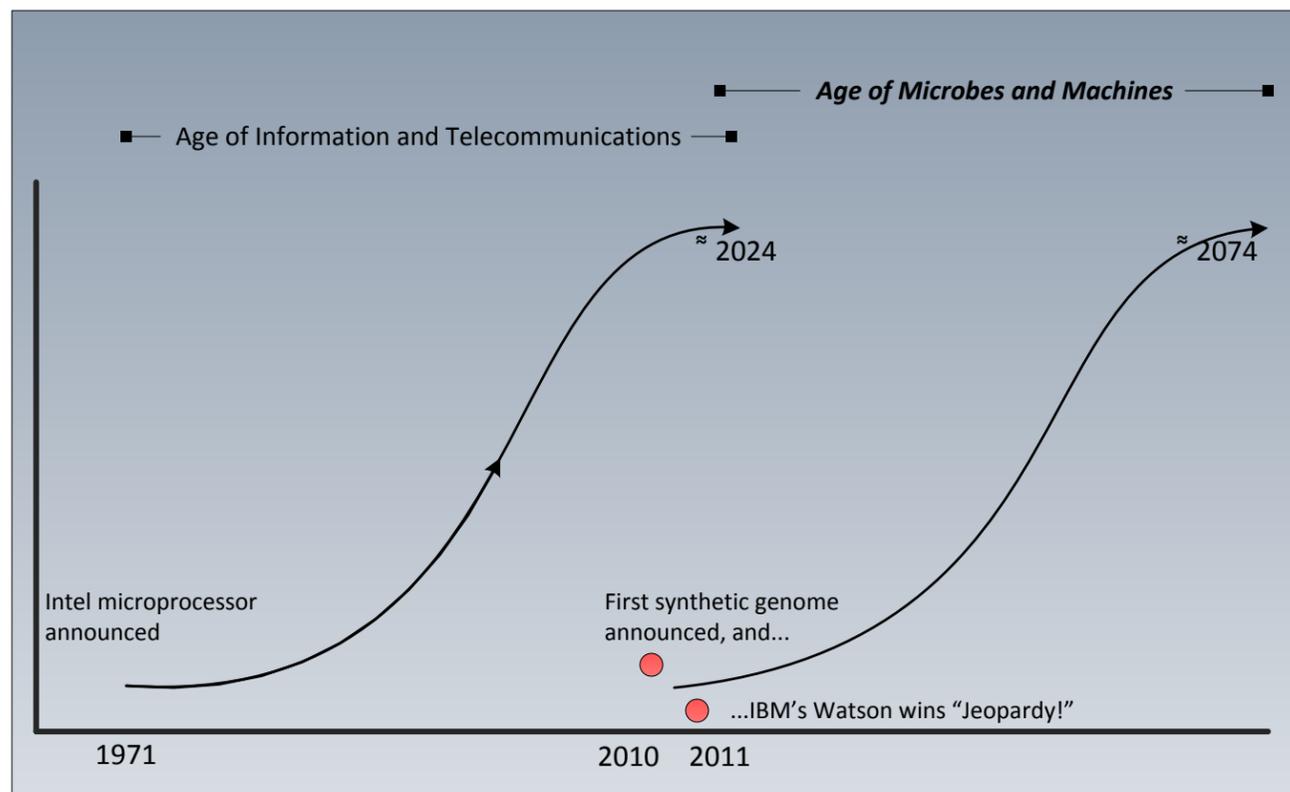
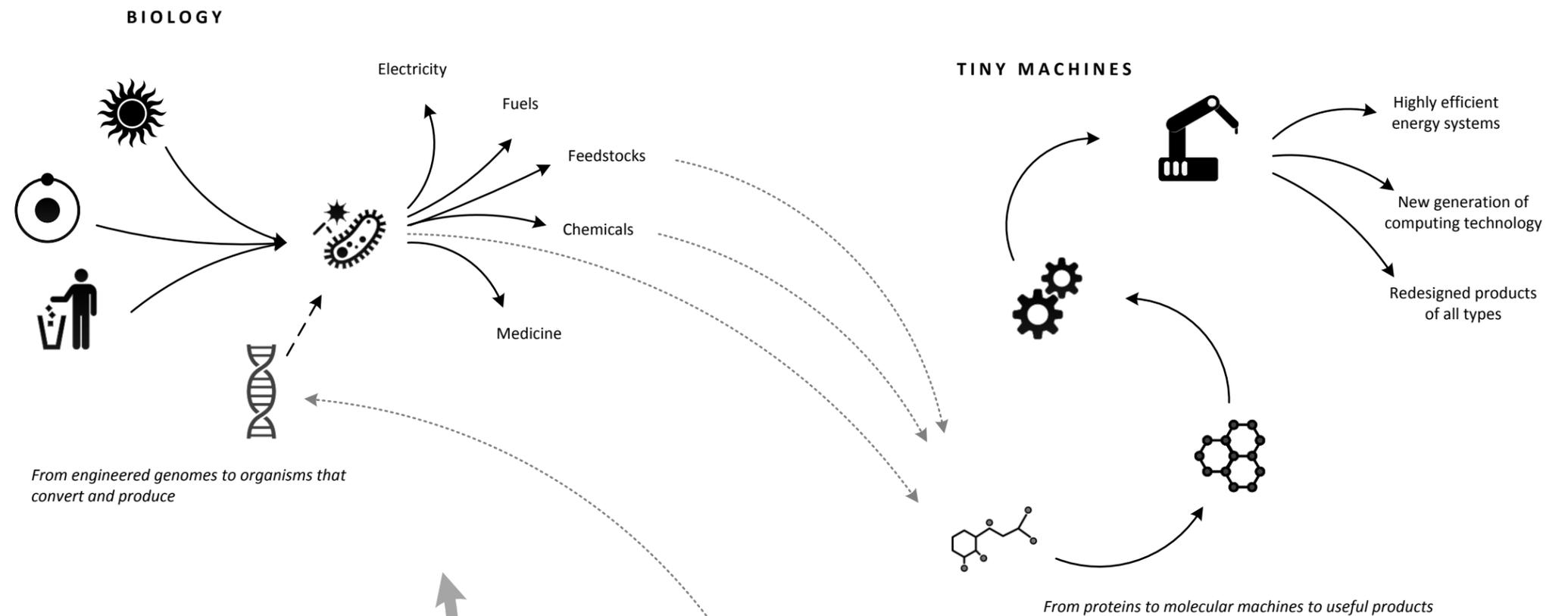
The announcement in 2010 that researchers at the J. Craig Venter Institute had “booted” up a living cell with the first fully synthetic genome and the announcement in 2011 that IBM’s cognitive computing system Watson beat two human champions at the game “Jeopardy!” were the twin “big bangs” heralding the next technological revolution.

Together these two lines of technological advancement will intertwine and co-evolve to form the foundation for a new paradigm and new models of economic life:

- Digital technology that allows us to quickly and cheaply work at the level of genetic codes
- DNA to create organisms that convert that which is plentiful into that which we most desire
- Biology (proteins) making microscopic machines that make slightly bigger machines that make even larger machines that make useful things

And everywhere the silent but critical hum of algorithms powering the operation and evolution of machines. Software that monitors for us, hunts for us, learns from us, and anticipates us. Machines that exist to make us more powerful and machines that exist to do what we cannot and will not. Machines that exist to make the unfathomable amounts of data we are generating truly *useful*.

This is the age of microbes and machines.



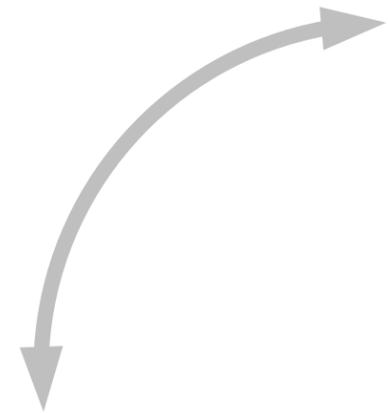
What Could People Build?

What types of *Infinite Economies* can we expect to emerge in an Age of Microbes and Machines?

It is impossible to predict exactly how individuals and organizations will adapt to any new technological revolution, but by combining an awareness of the innovations that are emerging today with an understanding of how people have adapted to innovations and challenges of the past, we can explore the types of situations we are likely to encounter.

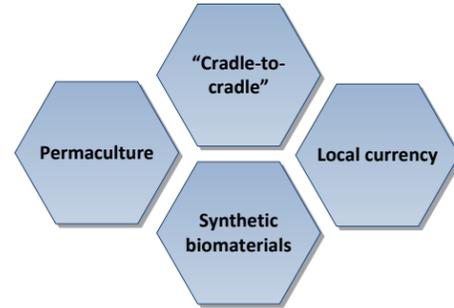
And diversity is likely one critical consequence of the next technological revolution. With so many people now deeply connected in economic life, with so many challenges faced by different people, and with so many emerging technologies and ideas, we are likely to see very great diversity of innovations and adaptations.

Indeed, we are counting on it.



The Resilient Commons

- Largely self-sufficient, sustainable local economy
- Low waste, high recycling and reuse
- High “unemployment,” high material security
- Neighborhood-level digital “fab labs”/maker spaces
- Mini biorefineries are common home appliances
- Global online networks for custom genomes



Diane, mayor of a small rural town

“I have to admit, the late 2010s were rough for our town, and most thought we wouldn’t make it. Digital life was destroying our jobs and our hope. But ‘making it,’ well, that was the key, wasn’t it?”

“Who would have thought that by combining the ‘maker’ culture of the Millennial Generation with biotechnology a small town like ours would be able to generate our own energy, clean our water and recycle waste, design the perfect materials – that we grow and print – to build our homes, and grow our own foods that can thrive in the new weather we’ve been having?”

“And what our own folks can’t come up with on their own we can get from an entire world of designers and innovators. Custom genomes for converting our specific local flora? There’s a market for that. Buying goods that we can’t make locally? Currency exchangers let us instantly match up local services and microtasks with whatever “cash” we need.

“We’re still connected to the global economy; we’re just no longer subservient to it. And we’re happier than ever.”



The Megacity Dream

- Connectivity, crowdsourcing, and distributed processing are core elements of the infrastructure of “smart cities”
- Individuals are hyper-connected and hyper-augmented through intelligent, adaptive machines
- Machine-augmented companies (MACs):
- Most economic activity is only partly regulated

Horus, megacity teen and self-professed “hustler”

“The city is where it’s at: the people, the energy, the opportunities. Everyone is here. And their needs are massive, and I mean MASSIVE. Food, water, housing, work, crime... there are endless problems to solve. But you gotta have the hustle. The city has always been about the hustle.”

“Take me. I’ve got three companies: GenHouse, a clearinghouse for custom genomes; DMAIN5, a peer-to-peer repair network for digital fab; and CivicPro, a predictive promotions platform for community service. They’re all profitable and they’re all skinny. I don’t know that much code, and I ‘ain’t no repairman, but I do know ideas.”

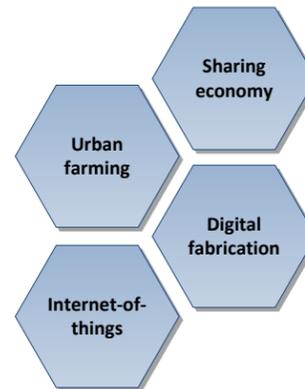
“And that’s all that matters because I got machines doing my research, cranking my analytics, helping me with design, handling my customer service, and coding my contracts. My empire’s global and all I have to do is keep jumping on the next opportunity, coordinate my machines, and troubleshoot the occasional problem.”

“Best of all, my programs are constantly shuffling my money through every conceivable type of currency: big national ones, cryptos, little local ones, corporate credits, and even straight up service bartering. The tax man CANNOT keep up with me! In fact, I’m working on my fourth company right now, a little something with what they call arbitrage...”

“I got to keep inventing ‘cause here everyone’s hustling and in some way or another, everyone has to be CEO of their own little empire.”

C3: Conscientious, Collaborative, City-Dwelling

- Pervasive computing and ubiquitous access
- Decentralized fabrication and supply chains
- Low ownership, high use
- Just What I Needed, Just In Time (JWINJIT)



Fred, parent and professional

“City life is great and getting better every day. Second and third tier cities like ours used to struggle to compete in a world of emerging megacities, but we’re learning to rewire our own economic lives to redefine affluence and, by extension, poverty.”

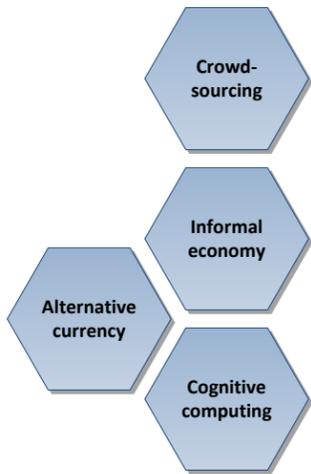
“Urban farms (with whom I consult) provide more of our food each year while bioreclamation businesses across the city use the latest engineered microbes to turn waste streams into fuel and feedstock streams.”

“Global networks of designers and local networks of decentralized manufacturing, combined with scary-good automation of predictive purchasing and production chains means that we can get just about anything we need just when we need it.”

“And speaking of manufacturing networks, we don’t do allowance with the kids: my 8-year old son has a little side business doing digital design work for action figure accessories incorporating biobased feedstocks (from I-don’t-know-where) while “outsourcing” some actual fab work with our home 3D assembler to his 5-year old sister.”

“Which reminds me: with so many things today being designed and produced with biomaterials that themselves are designed to be broken down into usable “stuff” for new products, the city’s refuse functions are slowly morphing into processing agencies staffed with chemists and biologists and design experts.”

“It’s certainly a brave new world.”



The Challenge and the Opportunity

The Historic Challenge

Rising populations, urbanization, digitization and automation, and long term climate change are just the most prominent of an array of trends and issues that policy makers, community leaders, and individuals confront today when they look out upon the economic landscape.

One way or another our societies are in for profound change. The rising, and urbanizing, populations of the world are reaching for the brushed metal, ultra-modern lifestyles that the developed world has dreamt up. For their part, the citizens of post-industrial societies are trying to redefine the assumptions of modern economic life... while becoming the most interconnected and technologically dependent people in human history.

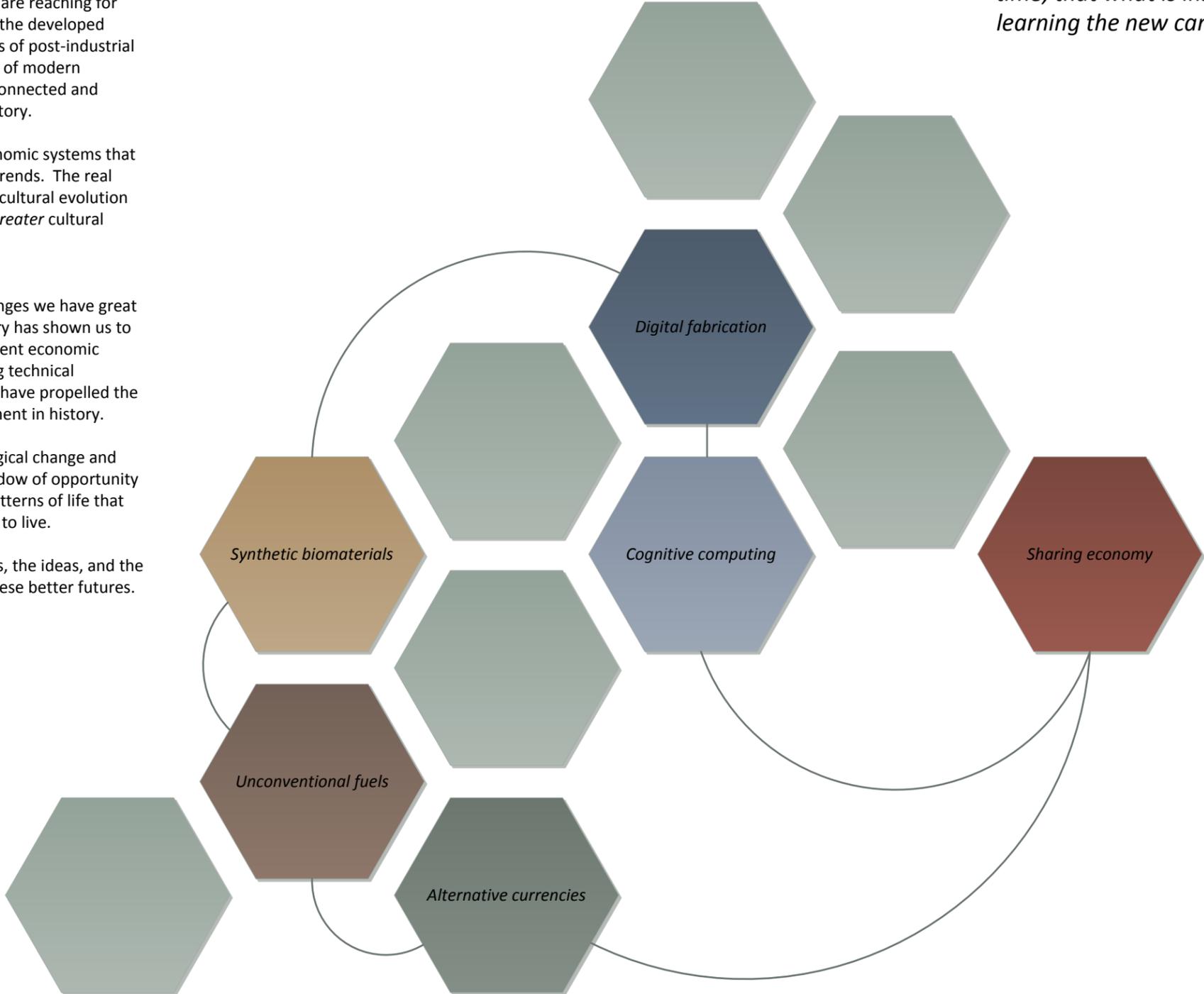
The challenge now is to create the kinds of economic systems that can reconcile these contesting aspirations and trends. The real danger at this juncture in history is that human cultural evolution might slow down. What we need right now is *greater* cultural innovation than ever before.

The Unprecedented Opportunity

Yet, even as we confront such significant challenges we have great reason to be hopeful. Our long economic history has shown us to be resourceful, inventive, and resilient. Our recent economic history also reveals powerful dynamics involving technical advancement and social change, dynamics that have propelled the most astounding social and economic development in history.

As we anticipate the coming waves of technological change and social adaptation, we can see an important window of opportunity for us to develop the new solutions, the new patterns of life that will form the kind of futures we all say we want to live.

And today, emerging all around us, are the tools, the ideas, and the connections to each other we need to create these better futures.



“... progress can involve significant changes in direction; that accumulation may require ‘disaccumulation’ from time to time; that what is installed may have to be ‘uninstalled’... that learning the new can require unlearning much of the old.”¹

HEADING FORWARD

Avoid Complacency

Do not assume that the current systems are “good enough” to meet either our challenges or our aspirations. And do not underestimate the ability of institutions and privileged actors to slow down, constrain, or deflect change.

Anticipate Disruption

Technological revolutions are followed by periods of social and economic dislocation before real expansions of opportunity or general prosperity. And expect overlapping cycles to produce even greater social turbulence and opportunity.

Encourage Diversity

The innovations that will overcome our rising challenges, the innovations that “stick,” can only emerge if enough of us, all around the world, share, collaborate, and experiment to develop the answers for the next economic era.

¹ Perez, Carlota, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages.*

For more on the *Infinite Economy* and other insights into the future

CONTACT US

Dr. Lum and Vision Foresight Strategy (VFS) are available for presentations and workshops on the *Infinite Economy*. If you are interested in having him present to your organization please contact VFS at admin@kikilo.biz.

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ABOUT VISION FORESIGHT STRATEGY LLC

Vision Foresight Strategy LLC (VFS) is a foresight and strategic analysis firm based in Honolulu, Hawaii.

We work with senior organizational leadership to reframe their understanding of the forces shaping their environment and help prepare their teams for navigating and shaping those emerging changes.

Founded by professional futurists we are a global network of experts that love the challenge of seeing and thinking strategically in a world of complex and dynamic change.

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VISION FORESIGHT STRATEGY LLC



Reframing the Future

VFS offers an array of services to assist organizations with reframing the future

FORESIGHT

Professional futurists are uniquely positioned to help you develop insight into how and why the future will be different from today. With a network of academically trained and globally experienced futurists we can assist your company with any foresight need.

- Original research and forecasts
- Scenario projects
- Facilitated foresight engagements

STRATEGIC ANALYSIS & STRATEGY DEVELOPMENT

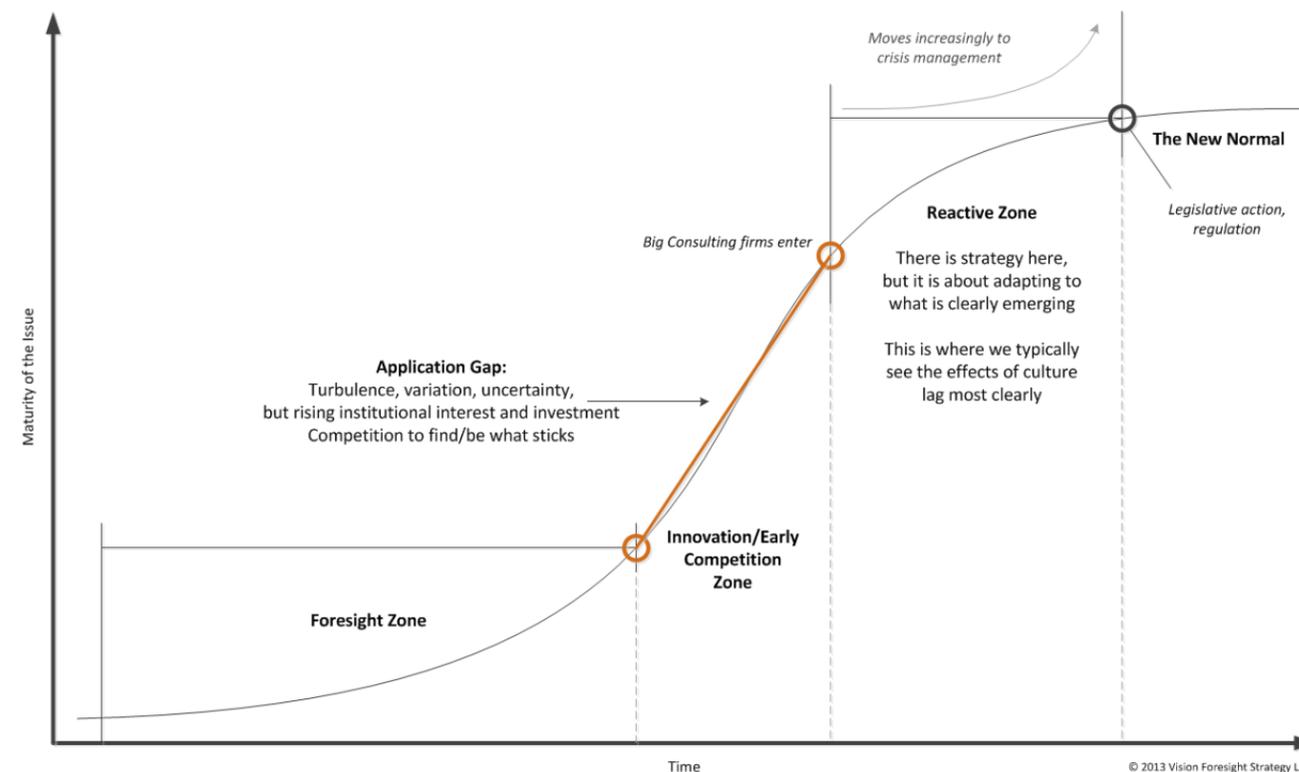
VFS can provide valuable assistance with framing and facilitating your organization's critical strategic conversations. From analysis of environments of high complexity and high uncertainty to remodeling organizational strategy, we can help move you forward.

- Planning engagements
- Strategic analysis
- Ongoing planning support

TRAINING

We offer a variety of corporate training modules covering foresight and strategic thinking and have a roster of experienced educators and trainers to provide engaging skills development experience for your organization's leaders and high potentials. Contact to us to learn more about our training offerings.

- Training for in-house staff
- Open registration courses
- Multiple levels and specialized courses



For every organization there is a balance to be struck between tending to the urgency of the present and preparing for the important things that the future will bring.

While it certainly seems as if everything today is changing at breakneck speed, the fact is that not all change is equal.

VFS can help make sense of the myriad changes that are underway in the world around you and help you take informed and confident action.