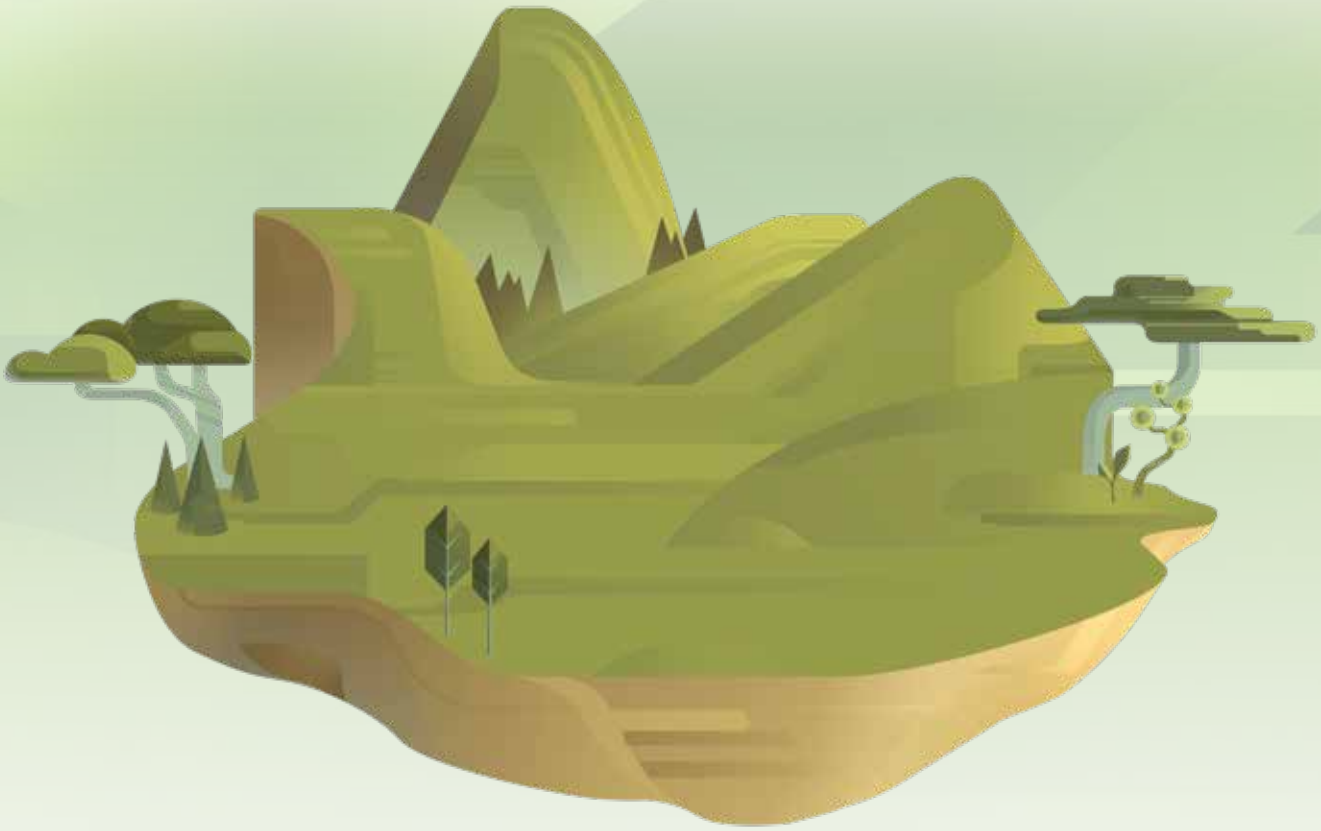
TRAVEL GUIDE

Country of the future



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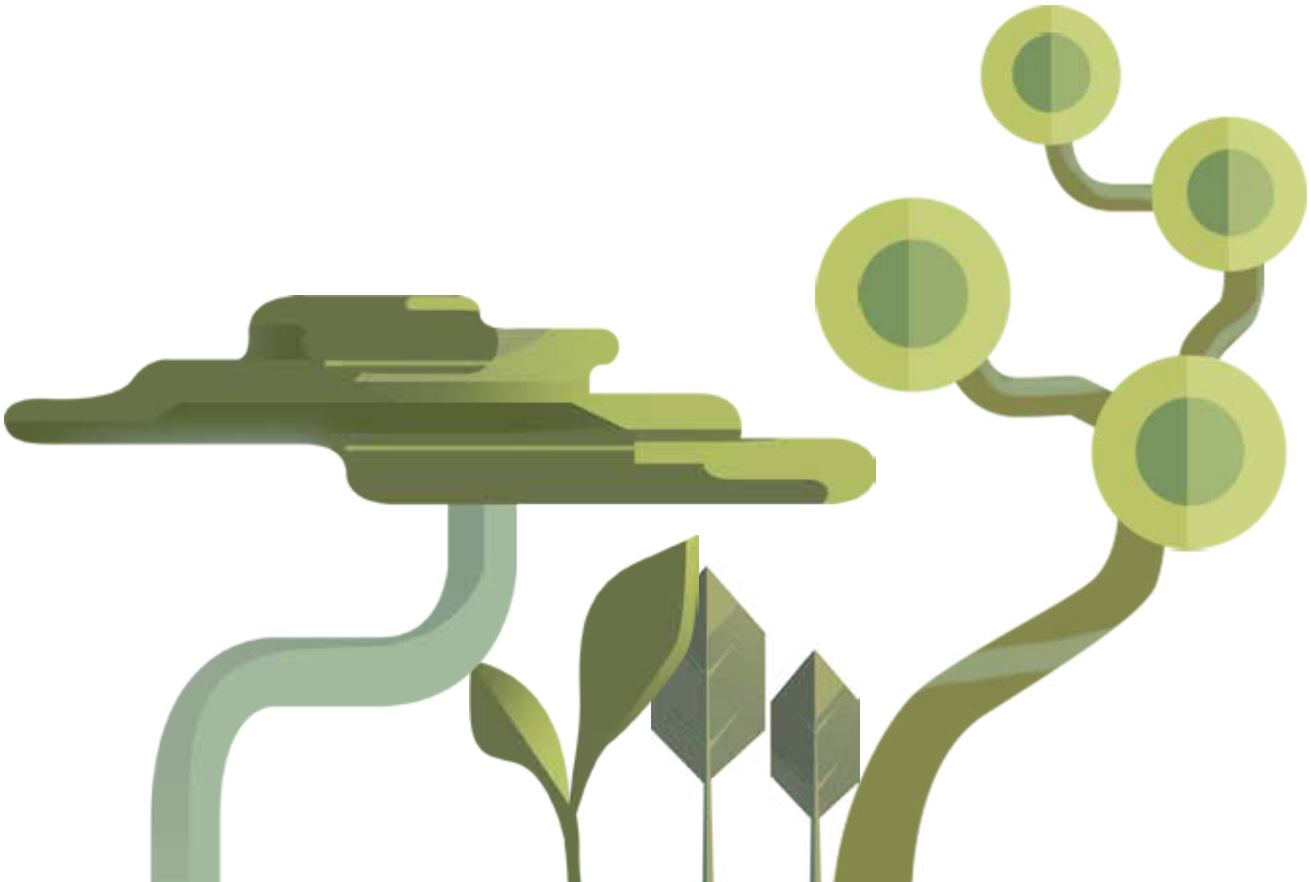
Country (noun):
from “contrata,” “the land
spread before me”



INTRODUCTION

As people migrate like never before, and innovative new businesses stretch effortlessly across the globe, our relationship to our physical geographies is changing fundamentally.

Consider the major shifts currently underway in our labor markets. Automation is often the headline of this story, and for good reason, as we see it scooping up jobs and expertise from across all sections of the economy. Upwork commissioned a survey last year which found that over 35% of the American workforce is now participating in the freelancer economy, and that the majority of these workers do so by choice, preferring the flexibility and diversity of income streams. These part-time gigs are increasingly coordinated by global microwork platforms like Uber, which, despite its corporate turbulence, now holds the position as the third-largest private employer in the world. And as many more traditional employers take advantage of these same kinds of online tools to distribute teams, 24% of American workers reported in 2016 that they did some or all of their work from home.

What do these trends have in common, in addition to raising calls for Universal Basic Income from Elon Musk and others? Unlike almost all the work humans have done for the centuries before now, robots and software aren't rooted in traditional geographies. If you can work from home, you can probably work from just about anywhere. Even as these trends enable more flexible work streams and efficient productivity tools, they also significantly untether us from our physical countries. Now add to this the effects of climate change, as it threatens to radically alter the face of our territories, and the country of the future presents some striking possibilities for the next decade and beyond.

For one, we shouldn't be that surprised to see cities that are largely abandoned due to floods and extreme temperatures, and cities where human residents are largely replaced with automated factories and self-operating agricultural equipment. Perhaps many of these will be the same cities.

We should also expect to see large-scale transformations in the nature of our infrastructure. What happens to the people and communities left in places where the roads and pipes are crumbling, the jobs have been automated away, and the climate is making agricultural livelihoods more difficult? What do we expect these people to do?

One hopeful signal can be found in Haiti, a country all too familiar with climactic volatility. Traditional development efforts to install solar and water infrastructure in Haiti have struggled, as well-meaning foundations and NGOs leave behind systems that have nothing to do with the daily lives, culture, or stories of the Haitians who are expected to maintain them. Enter Energy24, a company that's turning infrastructure investment into a new form of entrepreneurship. They provide portable solar generators, which Haitians can lease through the increasingly common payment platforms on their phones for pennies a day. Once they're paid off, the individuals own them outright, and are personally incentivized to maintain and grow the market for these services by leasing them to others.

Over the next decade these new business models could be applied to water filtration, container farms, solar-panel roofs, and potentially even a new breed of smart toilets. By 2027 we may see many rural areas, from Appalachia to Haiti, taking advantage of these new distributed-infrastructure technologies as an alternative to Universal Basic Income, owning and managing the services that their governments can no longer afford to provide.

And perhaps we'll see far more radical developments. As new technologies allow, our vast oceans provide both unoccupied space and intriguing regulatory possibilities. Many of us may even seek refuge in new virtual territories and workspaces that allow us to design truly post-global environments for gathering, socializing, and working.

This is your guide to the country of the future.

forecasts

ALGORITHMIC INNOVATION ZONES

In recent years, automation has become a key focus of innovation across sectors as diverse as agriculture, manufacturing, and transportation. But over the coming decades, innovation itself will be automated, as algorithms evolve to reinvent complex physical and social ecosystems in zones ranging in size from warehouses to cities.

Changing Fictions

Human wisdom about how best to manage innovation has shifted dramatically over the past 50 years. Once the purview of large corporate and university labs, in the 1990s the cutting edge of innovation practice decamped to startup incubators in regions like Silicon Valley. More recently, in the crowded and volatile spaces of high delta markets like Shenzhen, entrepreneurs with access to open hardware and software systems play a fast-paced game of distributed combinatorial innovation.

The common goal of economic growth in each of these strategies has obscured important differences in how they actually create it. While corporate R&D labs invented products that their own companies were uniquely qualified to produce and market, innovative startups produced disruptive IP that could be traded for return on investment. Today's open, distributed innovation zones drive multiple income streams from rapid evolution of specific design parameters to meet diverse needs. This is precisely the kind of innovation where algorithms can outshine (or at least powerfully amplify) human inventors. And over the coming decade, they will forge a new model of innovation, in which they themselves are traded for wealth generation.

Changing Systems

To see how this automation of innovation is already occurring, start in the shanzhai open-innovation zone in Shenzhen, where a unique blend of entrepreneurs and global corporate producers is rapidly becoming the center of innovation for all manner of hardware—from wearables to personal devices, smart clothing to immersive media hardware, and the connected home. Over the next few years, this zone will be ground zero for small- and large-scale hardware innovations as the Internet of Things converges with distributed computing, especially on the blockchain.

The blockchain has recently been defined as a virtual distributed computer in which autonomous virtual objects—smart contracts—execute algorithmic operations without any central oversight or direction. Augmented with artificial intelligence, these smart contracts will increasingly self-evolve, creating a transformational ecosystem of autonomous entrepreneurial agents and autonomous physical objects, each advancing its individual scripts to contribute to the culture of autonomous innovation.

BY 2027

Over the next 10 years, two things are likely to happen. The first is that these complex, connected ecosystems of algorithms will advance the practice of parametric design: a process that uses algorithmic thinking to link design intent to results. Guided by economic, environmental, and even social intent, autonomous algorithms will test complex sets of rules and goals by literally instantiating them in physical spaces. These spaces may be small—a restaurant kitchen, for example—or they may scale dramatically on the back of the blockchain to create ad hoc infrastructures for cities, along with rules for their use.

Second, the evolutionary algorithms embedded in smart contracts will learn to recognize their own value. They will make themselves—or at least snippets of themselves—available in autonomous marketplaces for algorithms. Economic wealth will be driven by innovations in the algorithms themselves, with wealth accruing in those geographies where testing is most dynamic and complex.

Connecting the Dots: **Urgent Futures**

Era of Machine Learning

In the coming years we will see a rise in the number of urban environments where autonomous/semi-autonomous systems outnumber human residents. In some cases, this shift will be a response to persistent safety issues, such as climate-driven coastal inundation. In other cases, it will result from an economic "hollowing-out" accompanying the replacement of some human jobs with machine labor. Historically, these kinds of locations would typically be abandoned, left as ruins or ghost towns. This expected pattern may change in the next decade.

Abandoned human settlements could be used as innovation and experimentation zones, allowing autonomous and semi-autonomous systems to learn how to navigate human environments, as well as taking advantage of existing infrastructure without existing people to build production and delivery chains that maximize output—and without worry about endangering human life. As machines don't fret much about where they live, fully automated production centers could be built in places no longer welcoming to human habitation. Because these locations once held human residents, they would still have transportation, communication, and energy grid connections to thriving cities. They could thus support a full range of simulations, experiments, and even new models of production.

Authorship of Authority

All economic activity is guided by regulations—by rules that govern the natural conflicts that arise between the profit motives of producers and the interests of citizens and society at large. Regulations define how products can be manufactured, how workers should be treated, and how much pollution can be emitted. But how will regulations be designed when there are no workers to cover and no customers, or even citizens, to protect? Or when the goods being produced can't be predicted, or possibly even imagined, by any human mind?

Algorithmic innovation zones will demand a new kind of regulation: a simple, austere block of software code that defines the red lines for emergent, algorithmic processes of innovation. These algorithmic regulations will guide the outer edges of accepted experimentation, likely influencing viable funding sources if not the experimentation itself. Without knowing what these agents might produce, regulators will have to converge on simple, clear rules that cover a potentially infinite set of outcomes. The hard part? Trusting them.

AGRICULTURAL DATA CENTERS

As climate change and soaring populations apply intense pressures to the global food web, a new class of container farms are laying the groundwork for transformative visions of modular, portable, and data-rich agriculture in the coming decades.

Changing Fictions

Around the globe, many of our oldest and most entrenched cultural assumptions surround the production of food. It wasn't long ago that most of our ancestors farmed for a living, and the dilemmas surrounding today's global food web—producing enough fresh, organic food for over seven billion people—still rest on these ancient traditions. Eating locally and organically is an obvious and desirable option when you live in California, Bologna, or China's Yunnan province, but is much harder to practice in the harsher climates that most humans call home.

To achieve a future of scalable, hyper-local agriculture, we may need to let go of our pastoral assumptions of sun-soaked fields and straw-hatted farmers, and embrace a more unfamiliar agrarian world of stackable, purple-lit shipping containers packed from floor to ceiling with digital sensors and rack-mounted kale.

Changing Systems

Aerofarms, based in Newark, New Jersey, claims the title of being the largest vertical farm in the world, producing two million pounds of produce each year in a 69,000 square feet former steel mill. With purple-hued LED lighting and over 30,000 sensors, their process consumes 95% less water and 50% less fertilizer than traditional outdoor agriculture.

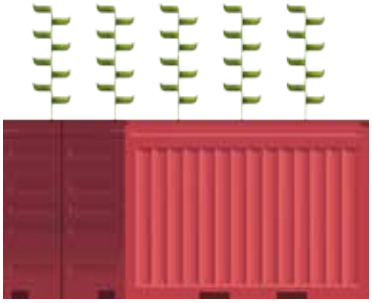
Freight Farms offers a similar solution, housed in 40 foot shipping containers that yield greater productive output than an acre of traditional farmland. They achieve this by growing leafy greens in tightly packed towers that can be harvested 12 times a year, regardless of temperature or external environmental conditions.

Even as global food producers generate sufficient calories to nourish the world's growing populations, economic and political disparities still result in close to a billion people going hungry each year. For urban deserts and conflict-prone emerging markets, land use issues and unprofitable distribution represent the primary obstacles to equitable food access.

BY 2027

As indoor farming technologies improve over the next decade, they will create new opportunities for resilience and variety in the distributed food web. Home-based micro-gardens may network together to offer similar on-demand access to fresh vegetables as Airbnb provides for overnight lodging. Regional variety and "local flavor" could be programmed into container farms as digital recipes, productizing the benefits of terroir and allowing anyone to grow Bordeaux grapes or the salad leaves from their favorite restaurant.

If planetary temperatures rise to expected levels, climate-agnostic vertical farms may begin to resemble sprawling data centers, generating entire regions' food supplies alongside real-time information about viability, distribution, and genetic diversity. This dynamic food grid may not inspire the same romantic feelings as a family farm, but it has the potential to yield incredible benefits in food equity, consistency, and adaptability.



Connecting the Dots: **Urgent Futures**

Designing for Impermanence

The world's poorest regions will be hit hardest by climate change, and the IPCC projects that Africa's agricultural output could be reduced by up to 30% by 2030. For regions accommodating displaced refugees and rapid population growth from other sources, container farming solutions provide a natural lever to quickly increase the capacity and variety of local food production.

Other forms of pop-up infrastructure may also benefit, including the street vendors and food trucks that provide convenient and inexpensive meals across the urban world. These informal kitchens have risen in prominence in recent years, and Singapore's "Hong Kong Soya Sauce Chicken Rice and Noodle" was awarded the first Michelin rating for a hawker stall in 2016. For these mobile eateries, it's not difficult to imagine the entire farm-to-fork pipeline being condensed to a highway convoy, ready to migrate on a moment's notice.

High-resolution Health

Modular agriculture promises to provide more than just food. Within their controlled environments and closed-loop systems, container farms offer natural laboratories for exploring the complex relationships between our food and well-being. Embedded sensors on every row of plants produce exponentially more data than our current ecological models were designed to interpret. Think of the regional and global picture that will emerge from many thousands of container farms providing real-time data at once. Our growing understanding of the microbiome—the complex networks of bacteria that inhabit all living environments—will demand even more rigorous analysis to reveal the historically invisible dynamics between food systems and community health, a project made possible by data-centric farming systems.

If we succeed, networked container farms will learn and adapt on the fly, integrating global lessons about genetic vulnerability and nutritional deficits into hyper-local and near-immediate solutions, not just for food, but for human health.

EMISSIONS BECOME ASSETS

As governments around the world try to stop the globe from warming more than 2°C (3.6°F), a suite of innovative technologies is poised to reshape the way we think about and deal with carbon emissions.

Changing Fictions

Greenhouse gases are widely recognized to be driving our planet inexorably toward an impossible-to-fully-comprehend future in which animals, plants, water, and people will shift their locations, and landscapes will become transformed. According to some estimates, we could reach the tipping point of irreversible change in a mere 20 years. Since over 70% of anthropogenic greenhouse gases result from carbon dioxide emissions, mitigation efforts have made carbon reduction the primary intervention point for new technological, governance, and commercial experiments.

At the same time, a host of pioneers are reframing carbon emissions from killer to asset, creating a new carbon economy. While reducing carbon emissions will remain a primary goal, the language of "carbon mining," "carbon farming," and "carbon engineering" will gain ground in the next decade. Significant long-term investments are slowly pushing forward carbon capture, storage, and usage systems. These processes grab industrial effluents or suck emissions directly from the air, separate and treat the carbon, then store the CO2 deep underground, re-use it in industrial processes like carbonation or agriculture, or turn it into useful materials such as concrete, low-emission fuel, plastics, and polymers.

Changing Systems

Carbon capture and usage investments and large-scale projects have accelerated in just the last two years. The world's largest carbon capture system, the $1 billion Petra Nova facility, began operations outside Houston in early 2017. The project captures emissions from a coal-fired power plant, compresses and pipes it to an old oil reservoir 80 miles away, and injects it underground, where it both forces new oil to the surface and takes the oil's place in the rock below. In Iceland, the CarbFix project recently demonstrated that 95% of the carbon from a geothermal power plant, injected into basalt, turned into stone within only two years—not the hundreds of years that some anticipated.

The private sector has also stepped into the ring in a more robust way: a $20 million Carbon XPrize competition is currently underway, with two dozen global teams competing to develop new products out of captured and treated carbon.

In 2016, energy company NRG announced the world's first piece of clothing made out of recycled carbon: industrial emissions were turned into a pair of sneakers.

BY 2027

As the planet continues to warm, ice melts, and coral reefs die, a new generation of entrepreneurial scientists, government agents, and investors will see the energy economy as the cutting edge of technology with a purpose. Large-scale demonstration projects will be found across the United States, Europe, and Asia, resulting in some measure of carbon emissions being stored, or embodied, rather than leaking into the air.

Carbon consciousness will be significantly higher than it is today, driven by a shift to consumption-based emissions metrics that highlight not just how much CO2 a country produces, but how much CO2 is embedded in products that are imported and exported. Scandinavian citizens, who in 2017 had simultaneously reduced the emissions produced in-country and increased the emissions they consumed via imports, will be driving on roads, and sitting in chairs made from recycled emissions.

Connecting the Dots: **Urgent Futures**

Beyond Blockchain

One of the largest obstacles to meaningful accounting of carbon emissions is the vast complexity, quantity, and diversity of the data streams required to quantify activity and impact. Over the next decade, these kinds of high-resolution data systems will improve in capability as artificial intelligence, blockchain-like record-keeping systems, and quantum computing evolve and mature. While these systems will be initially developed to address urgent needs in industrial, medical, and military use cases, they will provide a robust foundation for tracking and modeling environmental factors like carbon emissions.

CarbonCoin provides a potent example of one such use case. This cryptocurrency project, derived from Bitcoin, optimizes its payment scheme to provide carbon offsets like tree planting with the margin derived from every transaction. By 2027, software-enabled currencies could interact with environmental data more directly, subsidizing eco-friendly products and services while re-incorporating environmental costs into the purchase price at the moment of sale.

Designing for Impermanence

With the effects of climate change becoming more acute, carbon morality clashes will pit high-consumption regions vs. high-production regions. New metrics that track emissions by where products are consumed, not just where they are produced, will clarify the benefits and costs of industrial manufacturing. The challenge will be providing energy to support a new curve of carbon-neutral or carbon-negative economic growth.

Coal-producing regions in the United States, China, and Russia become sources of rare earth minerals mined from coal by-products, reviving the value of retention ponds and coal ash waste sites, once seen as polluted dead zones.

By 2027, the globe will be dotted with carbon economy pockets: cities and regions where innovative regulatory approaches and large-scale investments fund the commercialization of industrial emissions. Other places, long dependent on industrial manufacturing to drive economic development, may be disrupted by production characterized by decentralization and transience.

SMART TOILETS FOR NETWORKED HEALTH

For the world's high-delta markets and low-resource urban environments, nascent advancements in toilet technology offer enticing new business models for ambient health screening and population-level sanitation mapping in the coming decade.

Changing Fictions

We've long considered the contents of our toilets to be purely refuse, but over the next decade the world's largest health data set may well emerge from ambiently analyzing the feces and urine that are flushed into our sewers and septic tanks every day. Emboldened by a new breed of smart toilets, sanitation entrepreneurs have recently shifted the narrative from "human waste" to "toilet resources," creating new opportunities that promise to redefine the role toilets play in the health care system.

As sensor-equipped toilets evolve, they offer context-appropriate diagnostic hubs for assessing the health impacts of our diet and medications. They can even act as early warning systems for infectious disease. Governments and development groups focused on improving sanitation standards have set ambitious goals to distribute toilets to the 2.4 billion people currently without access to one. If low-cost sensors, cloud connectivity, and lab-on-a-chip technology can turn those "dumb" toilets into portals for health information, the smart toilet could well become an essential catalyst for improving sanitation and changing health behaviors worldwide.

Changing Systems

From sleep and fitness trackers to at-home diagnostics and direct-to-consumer DNA sequencing, our health systems are still exploring strategies for incorporating the deluge of new personal data into clinical practice. Toilet data, perhaps the largest and easiest-to-collect cache yet, holds the potential to supercharge these channels of continuously collected information and catalyze their application in real-time health dashboards.

In rapidly growing urban areas that lack traditional sewers, container-based toilet systems can be installed quickly, and without much infrastructure investment. These systems also offer a more efficient pathway for collecting health data from toilet resources. At MIT's SENSEable City Lab, the smart-sewage project known as Underworlds is already learning that it's difficult to separate human health data from the other inputs of a mixed-waste water treatment system. At an infrastructural level, these new sanitation systems could act as both a coordination platform for organizing the collection and maintenance of toilet resources and a digital layer to analyze the inputs at both an individual and population level.

BY 2027

In the coming decade, toilet resources may find themselves at the center of a newly thriving sanitation economy, and the toilet may become for distributed health what the phone was for distributed finances. "Toilet telecoms" will create markets in rapidly growing urban areas, subsidizing the cost of smart toilets in exchange for data-licensing of the accumulated deposits. In some cases, low-income communities eager to see the benefits of health monitoring and diagnostic hubs may find themselves committing to these licenses without full understanding of the terms of service. Those with more resources may choose to pay for premium smart toilet services (or publicly subsidized options) rather than give up control of their health data.

One can imagine a whole new layer of services popping up in response to the digital health sanitation system. India's dabawallas—the network of bicycle-riding delivery men who distribute hundreds of thousands of meals across Mumbai every day—could upgrade their daily lunch offerings to provide customized meals based on the smart-toilet reports uploaded to the cloud every morning. Signs of inflammation? Your lunch gets a little more turmeric today.

Connecting the Dots: **Urgent Futures**

High-resolution Health

Our evolving understanding of microbes has already fundamentally shifted our perception of what it means to be human—in recent years, we've gotten comfortable with the idea that we are far outnumbered by the bacteria inside us. It has become less taboo to talk about gut health (as we've also seen a rise in gastrointestinal problems like Chron's and celiac disease), and we are still unraveling the amazing relationship between our guts and our brains. The human enteric nervous system constantly carries information about the health of our guts to the command center in our brain.

There's an opportunity to replicate that gut-brain connection at a larger scale—like a digital enteric nervous system that collects and aggregates a community's toilet resources data to provide real-time input to decision-making in medicine, urban planning, and individual behavior change.

Era of Machine Learning

We've seen the value of "leapfrogging"—jumping to a later form of a technology as a consequence of not being able to fully embrace earlier iterations. Although we can see it in everything from energy to the military, it's most visible in the realm of information and communication technologies.

For countries that adopted water and sanitation infrastructures early, these systems are quite literally dumb pipes. In many places, they are decades or even centuries old. In the next decade, the sanitation infrastructure will become instead a component of the health care system. Sensors in sewage pipes, smart toilets, and even drinking water will give a country's leadership deeper knowledge of (and potentially influence over) the health status of the citizens. For individuals, smart sanitation technologies could provide indications of a wide array of diseases. For institutions, smart sanitation will give early warnings of emerging pandemics or large-scale health problems.

VIRTUAL CITY-STATES

As mixed reality technologies continue to evolve, they will enable new globally accessible territories for people to inhabit, develop, and commercialize alongside geographical and virtual communities. These shared spaces will augment our existing environments and penetrate deeply into the endless virtual dimension, dodging cultural restrictions for some and amplifying them for others.

Changing Fictions

Mixed reality technologies are becoming mainstream at a volatile time for the world, as millions of people around the globe express distrust and disapproval with their existing institutions and power structures. As an extension of the online communities and e-commerce platforms that exist today, mixed reality is poised to amplify the disruptive influence of the Internet. It will provide immersive and collaborative spaces for people to escape to, and also to build new trans-geographical laboratories for design and innovation.

Saudi Arabia's residents already rank among the highest in the world for social media engagement. Particularly for the kingdom's younger population, the Internet provides community spaces where strict cultural rules around same-sex gatherings are not rigidly applied. Given the region's high individual wealth, mixed reality technologies could fortify and amplify these permissive channels of interaction. In China, the government's heavy investment and editorial control over connected services like WeChat suggests that their virtual territories will, by comparison, remain siloed, likely reinforcing the taboos and cultural boundaries of non-virtual society.

Changing Systems

It's no secret that virtual and augmented reality technologies, positioned for decades as science fiction fantasy, have recently crossed a threshold in their ability to produce viable and compelling experiences at consumer prices. IDC projects that today's $5.2 billion VR market will grow to as large as $160 billion by 2020, a surge reflecting an entirely new ecosystem of hardware, software, and back-end services.

In China, the recent explosion of low-cost mobile VR experiences has been accompanied by rapid investment in high-end hardware. HTC plans to roll out over 10,000 stores in mainland China to sell its $1,600 Vive VR rig. Analysts estimate that by 2020, Chinese-specific investment in AR and VR will approach $10 billion annually.

BY 2027

As the mixed reality ecosystem matures and evolves over the next decade, an entire generation will grow up immersed in the new capabilities it provides. If geopolitical volatility remains high, virtual cities may offer safe spaces for grassroots communities to explore alternative cultural narratives. They may create new rules, norms, and benefits for existing organizations to forge virtual workplaces for their remote workforces and prototype new business models for their global customers.

For nations that gate their residents' Internet access, however, the global map of mixed-reality territories may instead reflect and exaggerate existing cultural boundaries, producing highly fragmented silos of vastly different designs and capabilities. These contrasting visions will exist simultaneously, polarizing the experience of mixed reality users. By 2027, some virtual workers will enjoy dynamic and unconstrained collaboration with millions of others around the world, while others find themselves more deeply entrenched than ever in the assumptions and constraints of their local or regional cultures.

Connecting the Dots: **Urgent Futures**

Designing for Impermanence

Virtual territories will take on a new importance as we find our physical surroundings in peril. Digital spaces will pop up to cater to every person and preference. Some will be modeled on reality, like a re-creation of a town hall or a school ravaged by a climate disaster. Others may be governed by entirely different laws of physics and social norms where you can be anyone you'd like to be. With an overwhelming sense of volatility elsewhere, many will turn to these communities as a place of centering, a place of continuity, a place of permanence.

At the same time, VR and AR will allow people to bring home with them wherever they go, in ways that they never had before, and more than ever, to occupy different realities despite being in the same physical space. Mixed reality overlays have the potential to take the burden off of physical infrastructure, allowing a single space to be used for multiple purposes—simultaneously a grocery store, a community meeting space, and a sports complex. A push for new architectural design standards for mixed reality could allow people to project familiar or exciting new surroundings no matter where they are in the world.

Security and Status

The image of an emaciated person in a dark, unfurnished room wearing headgear that immerses her or him in a vivid, enticing virtual world has been a science-fiction trope for years, even decades. As this form of technology moves from fantasy to plausibility, the reality of the user experience is likely to be much different. Life in a mixed reality world will be more commercialized, more practical, and more controlled.

Advertising-laden branded experiences are one (nightmarish) extreme of this future. More commonplace will be "walled garden" technologies where the most sophisticated features are only available when collaborating with others using the same producer's system. Some standards will emerge for cross-platform realities, but the desire for innovative uses and novel capabilities will be in constant tension with the desire for uniform experiences. The underlying conflict will be between approaches to underlying data structures and display technologies. Some will want to keep the data structures simple while making the display technologies "smart"—able to provide rich experiences that take advantage of the hardware. Others will wish to keep the display technologies generic and focus on making the data structures as complex and powerful as possible.

SPECIAL OCEANIC ZONES

As climate change and global trade add strain to the geopolitical landscape, the ocean's vast territories will play new roles as a backdrop for 21st century resource hunts, floating settlements, and zones of economic innovation. The result may well be special oceanic zones (SOZs), analogous to today's special economic zones (SEZs).

Changing Fictions

Since the 1950s, special economic zones (SEZs) have become a powerful tool for economic innovation in otherwise constrained regions. Myanmar partnered with Japan in 2014 to create a 1,200 acre SEZ not beholden to the country's existing regulations, and China has defined over 100 SEZs since the 1970s to spur foreign investment and innovation. Today, the development of cryptocurrencies and the exploration of radical social policies like Universal Basic Income are creating new demand in experimental markets, with a larger potential for transformation than existing regulatory environments can provide.

At the same time, a confluence of trends is catalyzing the development potential of our largest unsettled territory: the ocean. Between the rising seas of climate change and the technological underpinnings of space exploration, ocean-based settlements may prove both more viable and desirable in the future, particularly as they offer regulatory gray zones with little to no formal oversight.

Changing Systems

In 2016, China announced plans to build a massive sea lab 10,000 feet beneath the ocean's surface, the first of its kind. Such ambitious aquatic bases will prove useful for securing untapped resources, as well as for mining the literal seas of data hiding within the ocean's 300 million cubic miles of water. A new class of autonomous seafaring drones, including the data-collecting Saildrones in Alameda, California, promise to elevate our systemic understanding of how the ocean supports life–and how it's changing—in ways that were previously impossible.

Cities like Miami and island nations like the Maldives are already confronting the reality of rising sea levels today. America's National Ocean Service warns of flooding increasing in the near-term by as much as 900% from recent historical norms. As the century progresses, the catastrophic effects of climate change will drive millions from the coastal cities and regions they currently call home, creating even more urgent demand for new human settlements.

BY 2027

Between the displacement of climate refugees, the allure of new economic zones, and advancing technological capabilities, the viability of settling and inhabiting the ocean will increase over the coming decade. The future-oriented Seasteading Institute has already secured a "seazone" designation for floating cities in French Polynesia, as Mars-bound initiatives like SpaceX spur the development of artificial environments to support human life.

Perhaps the first practical ocean settlements for large populations will build on the infrastructure of international shipping. Shipping containers have already proven to be versatile environments for micro-apartments, farms, and medical clinics. It's not difficult to imagine the global migrants of the future leveraging this adaptable infrastructure in its original context, stacked high on massive container ships, taking advantage of their unique geography and digital currencies to incubate new forms of economic activity.

The ocean has long served as the ultimate symbol of exploration—the expanse that must be crossed to discover new territories. This next decade may find us looking at it differently: as a new zone of innovation, as the new company town, or perhaps, like the Sama-Bajau peoples of Indonesia, as our future home and way of life.

Connecting the Dots: **Urgent Futures**

Designing for Impermanence

Faced with a climate-based ultimatum to leave the place they once called home or suffer the consequences, as well as growing hostility from other countries, some migrants may turn to the ocean for their new residence. Already, communities and countries from Alaska to Kiribati have found themselves grappling with the question of relocation based on the rising sea level. Seasteading, it ends up, might be one of the few ways to preserve the communities, cultures, and ways of life of some climate migrants.

The costs will likely prove prohibitive to those in the most need. But for those who can afford them, Special Oceanic Zones offer the ultimate in flexibility. Designed with detachable housing platforms, individuals will have the ability to relocate to different zones with different governing structures and value systems. And rather than being susceptible to the elements, these new water-based communities can proactively avoid major storm systems, following weather patterns to collect essential rainwater and other resources as they forge the high-tech path of modern-day hunter-gatherers.

High-resolution Health

For human bodies, the next decade will be one of adaptation to increasingly extreme environments, and no environment is likely to be more extreme than the coastlines of the world. As marine economies struggle to make more of declining global fisheries and coastal habitats secure themselves against rising tides, people may quite literally become the new biological interface between sea and land.

The great biodiversity of the sea will inspire bio-prospecting, amplified by advances in biological programming to create both new knowledge of the interactions between human systems and marine systems, and new products that help humans adapt to the changing demands of the global ecosystem. In the extreme, these adaptations could turn humans into desalination organisms: bio-wearables might draw on the lessons of mangroves and tilapia to concentrate salt out of the water and excrete it from the wearers system. Such adaptations are clearly long-term solutions, but perhaps not as long as natural evolutionary adaption. They certainly seem plausible within the century-long timescale of global climate change.

scenarios

CITIZENSHIP

citizen slam

Wake up and find that you've been converted to a new citizenship.

The spread of "platform governments" and non-geographic citizenship in the mid-2020s had a number of unexpected consequences. For many people in the wealthier countries, the largest surprise would often come from discovering that they'd been made citizens of another country—usually, but not exclusively, a non-geographic entity.

Typically, the discovery would come when the individuals received forms indicating how much income tax was owed to the other government. Legal protests would inevitably reveal that the individual was officially (and, in most cases, legally) a citizen of the other country, and that the taxes owed were legitimate. In countries like the United States, where carrying multiple passports was permissible, this was a major but non-catastrophic problem. In countries where multiple citizenships were not allowed, such as Korea and Austria, the resulting complications were much more severe. In many cases, the acquisition of a new citizenship meant the automatic loss of the original citizenship.

Western observers referred to this process as "slamming," hearkening back to a 1990s practice of surreptitiously changing long-distance providers on unsuspecting consumers. Customers would unknowingly rack up thousands of dollars in bills. Regulations and better rule enforcement eventually put a stop to the scheme; citizenship slamming was expected to follow a similar arc.

Initially, successful entrepreneurs were a lucrative target for the slammers, as they often handed off taxes and other paperwork to third-party services. When they would finally discover the problem, some individuals found that they technically held citizenship in a dozen different "countries." Some individuals would learn of their assortment of legal nationalities when they were stopped at the airport, under investigation for immigration fraud or worse.

Within 18 months, however, slamming became a tactic of choice for platform governments seeking to establish functional authority over a given geographic area. One virtual government used this to attempt to carve off a stretch of Egypt as effectively independent. A platform government known to be a tool of the Pakistani state attempted to take advantage of a border disagreement with Iran over the Baluchistan region.

The final trigger for an international crackdown on the practice came from the so-called Balkan Passport War. In a three-week period, Serbia, Croatia, Bosnia-Herzegovina, and the Republic of Macedonia used slamming as a way of both capturing disputed territory and kicking out citizens of the wrong ethnicity—over 3,000 Bosnian Serbs woke up to discover that they were now citizens of Serbia, and had to leave Bosnia within 72 hours.

POWER

minimum required citizenry

As automation increases, in both business and the military, countries start looking at revoking citizenship and expelling "unneeded" citizens.

As with most of the Gulf states, the United Arab Emirates faced ongoing criticism over its treatment of foreign workers, particularly those from the developing world. In 2025, the UAE responded to these criticisms by announcing that nearly all non-citizen workers—almost 10 million people—would be deported over the subsequent six months. Amid raucous protests, governments across the global South scrambled to provide transportation back home for these workers, even as they worried about the loss of remittance income.

Observers were shocked. The 10-million foreign workers made up a sizable majority of the residents in the UAE. Many analysts predicted economic ruin, both from the loss of consumers and the inability of Emirati citizens to take over all of these jobs. As the six-month deadline came and went with many of the foreign workers still living in "processing facilities," most outsiders saw this experiment as clearly a massive failure.

But the UAE did not expect its citizens to take up these jobs. Instead, it accelerated its program to replace nearly all work (especially that once done by foreign workers) with automation. Combinations of software agents, robot swarms, and human experts took on the menial, repetitive, and sometimes dangerous tasks done by foreign workers. As the UAE was in the midst of a large-scale conversion from a petroleum-based economy to a solar power-based economy, Emirate infrastructure was already migrating to a system relying on automation. This policy decision merely sped up the transition. While some roles would continue to be filled by foreign labor, by the middle of 2027, more than 85% of non-citizen employment had been lost.

The UAE took an arguably even more radical step later that year by announcing the 10-year transition of its military, the Union Defense Force (UDF), to a 90% robot configuration. As the UAE military personnel numbered under 75,000 people, observers did not see this as an insurmountable challenge. Ground, air, and littoral combat vehicles could be readily upgraded or replaced with autonomous warfare systems. The UDF leaders adopted strategic formations and tactical plans proposed by Western think-tanks for use in the future, making the UAE the first—but by no means the last—military to embrace autonomous combat system dominance.

Leaks from within the UAE government showed that this was just the beginning. Over the next decade, loss-of-citizenship and exile would be used as a punishment for major crimes, especially those more often carried out by the middle and lower classes. Rumors suggested that this was to become a standard way of eliminating political dissidents. From a 2020 population of over 2 million Emirati citizens, the leaked documents showed that the group pushing the proposal expected the UAE to eventually hold only 1.2 million Emirati residents, what they termed a "minimum required citizenry" for the economy.

TRADE

carbon tariffs

The EU starts charging for "uncounted externalities," adding a tariff on imports that don't include cost accounting for various environmental and social problems arising from production.

Although it started as an act of political spite, the European Union's decision to slap a "carbon tariff" on goods imported from the United States—in response to the United States pulling out of the Paris climate treaty—became the seed for a much larger and important shift in global economic policy.

Economists have long recognized externalities, costs associated with the production and sale of products and services that go uncounted, because they are too widely dispersed, too difficult to measure accurately, or too long delayed between cause and effect. These uncounted externalities (such as carbon pollution, soil erosion, and diseases of poverty) can have significant impacts on communities, regions, and the planet as a whole. Attempts at Whole Cost Accounting/True Cost Accounting/Lifecycle Accounting gained sporadic popular support, but rarely entered corporate budgets.

In 2022, the EU introduced rules that required an independently vetted "lifecycle cost statement" for every good imported into Europe. If the producers and distributors of imported goods could not demonstrate that the lifecycle cost (from carbon mitigation to post-use recycling) had not been included in the price of the product, a special charge amounting to the estimated uncounted costs would be added to the product price. The EU put the collected fees towards international assistance for environmental health and remediation.

The global uproar was immediate and vicious. Because importers had 10 years to come into compliance with the rules, many manufacturers and distributors initially ignored the regulations. Other governments, conversely, sought to have these fees overturned as violations of trade treaties. Although the case has not yet been fully resolved, EU victories in a handful of key early decisions have pushed many global manufacturers to start undertaking lifecycle cost analysis. In 2024, the new American administration explicitly embraced the lifecycle cost concept, insisting along with the EU that it be included in the latest drafts of the long-delayed Trans-Atlantic Trade Partnership.

Not surprisingly, the conspicuous absence of European manufacturers and distributors in the original lifecycle cost scheme rankled environmentalists, international competitors, and a growing number of EU citizens. By 2026, legislation in the European Parliament sought to bring European corporations into the same lifecycle cost framework, in anticipation of the need to do so under the eventual TATP rules.

European economists acknowledge that the near-term results of these changes will be higher prices. But they promise that, over time, the price disruption will push manufacturers to seek ways to eliminate these previously uncounted costs, improving both their bottom line and global conditions.

INFRASTRUCTURE

freemium government

VR environments are limited by how much/little you pay ("freemium VR" model), which is adopted by many public agencies.

The growing use of "enhanced reality" (ER) technologies, especially virtual reality headsets and augmented reality glasses, proved to be a runaway market for entertainment, business, and all manner of creative activities. Trains and buses around the world were soon full of passengers wearing colorful (if somewhat bulky-looking) goggles, immersed in their own personalized environments. Commercial entities jumped on the Virtual Reality Application—or "vapp"—bandwagon as quickly as they could, with all sorts of business models (from straight-up purchases to subscriptions to Playola-style pay-for-play schemes) driving what rapidly became a multi-billion-dollar global market.

Unsurprisingly, most civic and governmental authorities were slower to adopt ER and vapps, but in some locations—like Australia—they proved to be quick studies. As ER systems plunged in price, the Canberra government was among the first to build official systems requiring access via vapp. Australian ministries were also early adopters of another ER trend: freemium access.

Commonplace in mobile gaming, the freemium model offers completely free-to-use applications with fully-functional basic features. But as users run the apps, it becomes clear that certain features and functions that make the game or environment more rewarding can be acquired for a price. Although some critics decried this as "pay-to-win" in games, freemium access proved wildly popular for app developers.

In the scheme adopted by the Australian government, the Oz.vapp program would give every citizen, migrant, and visitor a toolbox of useful features for free, making many basic government interactions a straightforward process. But throughout the use of the free version, nearly every activity had a flag indicating that it could be much more swiftly and efficiently done with the paid upgrade.

Public reaction was mixed, and Canberra experimented with a number of different approaches in the following months. Eventually, they settled on a system that provided varying levels of free access depending upon tax and citizenship status. Migrants and refugees would be allowed to run Oz.vapp Basic, with minimal tools all aimed at facilitating a cautious interaction with the government. Formal residents could use the standard Oz.vapp. Higher-status citizens, such as government officials, entertainers, business executives, and high-income members of the public, could use Oz.vapp Prime, with all of the premium features unlocked.